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Questions & Answers...

THE BOWMAN LETTERS

A HISTORY OF A SEARCH FOR KNOWLEDGE ABOUT
THE NATIVE FISHES OF AUSTRALIA AND
NEW GUINEA FROM 1959 TO PRE-ANGFA

by Ron Bowman



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PREFACE

It was after the Sydney ANGFA 1997 Conference, during a chat with Effie Howe, that I discovered that Ian Munro had passed away in 1994.

I had corresponded with Ian from 1959 to 1976 in my quest for information on the various native fish species I was acquiring. After returning to Melbourne, I dug out my correspondence files and realized that I was in possession of something of a history of the dawning of knowledge of Australian fish species among Australian aquarists.

This document contains extracts from some of these letters from that time period which I believe will be of interest.

I would like to pay a special tribute to the work that Ian Munro put in during his years of dedicated work with the Commonwealth Scientific and Industrial Research Organization (CSIRO).

Ian retired from CSIRO Division of Fisheries Research on May 3, 1984 with 41 years continuous service as Assistant Research Officer 1943–1946, Research Officer 1947–1953, Senior Research Officer 1954–1957, and Principal Research Scientist 1958–1984.

Ian was appointed Honorary Post-Retirement Research Fellow May 4, 1984.

Early work with the Division centred around estuarine fisheries, then between 1943 and 1963 research centred around the biology of bream and Spanish Mackerel, developmental stages (eggs, larvae and post-larvae) of fishes, and general fish taxonomy. Publications comprised taxonomic revisions, descriptions of new species and descriptions of developmental stages.

In 1948–1950 CSIRO Division of Fisheries undertook a survey of the fisheries resources of Papua New Guinea in conjunction with Commonwealth Department of Territories and the Australian Administration in New Guinea. Ian accompanied the research vessel *Fairwind* for extended cruises in 1948 and 1949.

Extensive taxonomic collections provided substance for two large publications:

The Fishes of the New Guinea Region (checklist of 1429 species, published 1958) and

The Fishes of New Guinea (text book of 1069 species. xxxvii + 650 p., 6 + 78 pl. Published 1967).

In 1951 Ian Munro was seconded to the Government of Ceylon (now Sri Lanka) as Technical Advisor to Ministry of Industries, Industrial Research and Fisheries, being the first technical advisor sent by the Australian Government to Ceylon under the Colombo Plan of technical aid to south-east Asia. Work involved the organization of their fisheries research unit and training of graduate researchers in fish taxonomy and fisheries research methods. One result was the publication of the text book *The Marine and Freshwater Fishes of Ceylon* in 1955 (xvi. + 349 p., 56 pl. covering 846 species).

During the 1950's specimens from the New Guinea survey, together with specimens from Australian surveys and miscellaneous field investigations were gathered into an organized reference collection similar to those held by natural history museums.

The collection, known as the Ian S.R. Munro Ichthyological Collection currently comprises about 60,000 specimens including nearly 18,000 registered lots and containing representatives of about 2,500 species. The assembly, identification and curatorial care of the collection was a personal responsibility until Ian's retirement in 1984. At this time the collection was moved from Cronulla to Hobart.

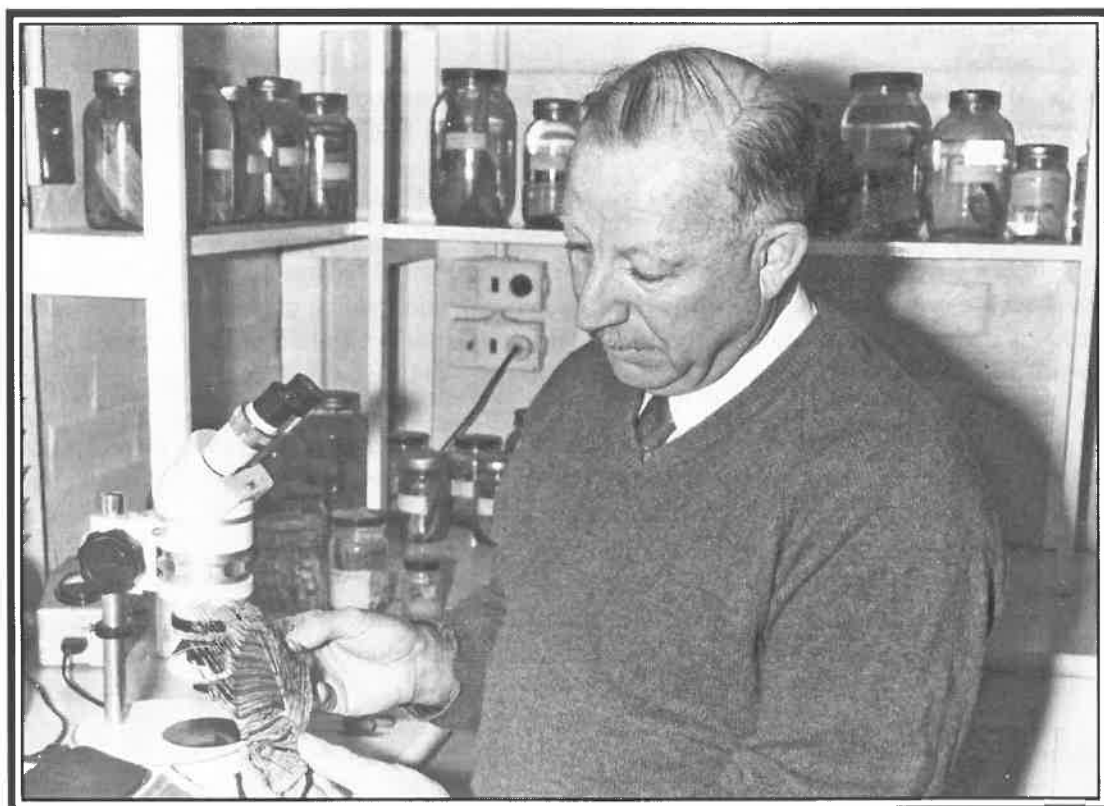
A major CSIRO project has been the publication of a *Handbook of Australian Fishes*. The first version was published in serial form as supplements to *Australian Fisheries Newsletter*. 42 parts covering 1013 species were published between 1956 and 1961. About half of the Australian fish fauna is covered. In 1973 work began on a revised version.

Ian was appointed project leader of the Gulf of Carpentaria Prawn Survey, 1963–1965, which work led to the opening up of prawn trawling in the Gulf and other tropical parts of Australia which is now a multi-million dollar industry.

In a letter (25/06/1965) he sent to me he expressed much of his frustration at being physically removed from his wife Joan, 4 children under twelve, his fishroom and much loved collection of Rainbowfishes and Blue-eyes. Ian kept many species of Australian Rainbowfishes with some from New Guinea long before most aquarists were aware of their existence. I was actively involved in the *Aquarium Society of Victoria* in those days and, through their then nationally distributed magazine ***finchat***, had established a network of contacts from Perth to Brisbane which became quite useful to Ian.

Ian Munro, through his dedicated scientific work with CSIRO and generous communications with fellow aquarists like myself, laid the foundations of knowledge of Australian and New Guinea fishes upon which others could augment and refine.

– Ron Bowman



IAN STAFFORD ROSS MUNRO, B.Sc.(Hons)U.Qld., M.Sc.U.Qld.
1919–1994

– photographer unknown

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THE PRE-ANGFA QUEST FOR KNOWLEDGE ON AUSTRALIAN AND NEW GUINEAN FISHES

by Ron Bowman

In May, 1959, I noted that Australia's only commercial aquarium magazine, '*AquaLife*' had ceased publication, leaving Gilbert P. Whitley's series of articles on the 'FRESH WATER FISHES OF AUSTRALIA' without a publisher.

As Hon. Editor of the Aquarium Society of Victoria's monthly magazine *finchat* I wrote to Gilbert P. Whitley, F.R.Z.S., Curator of Fishes, The Australian Museum, on the 21st. of May, 1959, offering him space to continue his series. At this time *finchat* was the only hobby magazine in Australia that was printed letterpress with blocks for photos and illustrations therein. Subscribers were being attracted from other States and we were at this time suggesting to other state Aquarium Societies that they join with us on a *finchat* per member basis with bulk posting to each Society so they could include their own roneoed (*a form of duplicating/printing*) club information and news as an insert in *finchat*. Great ideas aren't always accepted ... the various state club committees decided they could get one copy for their libraries and save money that way!!!

Little did I dream of the subsequent interchange of correspondence between myself, scientists, aquarium fish breeders, dealers and collectors that would eventuate.

Discerning readers will notice that very few of my letters to the various respondents are reproduced in this book. The explanation of this is that I kept all my copies of correspondence on a special chemically treated paper known as the 'new' NCR (No Carbon Required) system. This turned out to be a non-permanent system, much of which did not survive in readable form. However the replies from the various respondents often make the preceding questions from me quite obvious ... most of the questions asked were basically along the lines of ...

WHAT IS THE RIGHT NAME FOR THIS FISH?

**THE AUSTRALIA NEW GUINEA FISHES ASSOCIATION Inc.
(ANGFA)**

***is proud to present this historical record of a search
for information on Australian and New Guinean Fishes***

Telegraphic Address
"MUSEUM"



IN YOUR REPLY REFER TO

No.

TELEPHONES:-
B.056 { DIRECTOR..... EXTENSION 2484
 GENERAL OFFICE " 2485

ALL COMMUNICATIONS ON OFFICIAL
MATTERS
SHOULD BE ADDRESSED TO THE DIRECTOR
AND NOT TO ANY OFFICER BY NAME.

*The Australian Museum
Sydney*

29 May 1959.

R.L. Bowman, Esq.,
Editor, "finchat",
49 Chadstone Road,
Chadstone, S.E.10, Vic.

Dear Mr. Bowman,

Thank you for your letter of 21st of May and the copy of the June 'finchat'. This is the first time I had seen your publication, as I have not seen the May issue.

I should like to become a regular subscriber to it as it seems an excellent magazine and all the more necessary since 'AquaLife' went out of business. I hope that, like 'AquaLife', it will devote a great deal of space to Australian native fishes, and I shall look forward to your articles on their breeding habits in due course.

The Melanotaeniidae are very difficult to identify; it is best to have specimens rather than photos, as even the teeth may be important. As far as I can tell from your photos, the Bundaberg *Pseudomugil* is *signifer*, and the sunfish may be *Aidaprora carteri*.

Pseudomugil affinis was found in mangrove swamps (salt water) at Low Isles, North Queensland, and has also been taken at Great Palm Island. *Aidaprora carteri* is found in rivers running into the Gulf of Carpentaria and those of the N.E. Queensland coast.

I had prepared a rather long article on freshwater sunfishes (Melanotaeniidae) for 'AquaLife' but it was never used. I could let you have it for 'finchat', if you like. Illustrations of the species are available but new blocks would be required. The Melanotaeniid article as it stands runs to some 2,850 words and would require about ten separate illustrations. It has some technical data and a key to *Melanotaenia* spp. Such technicalities were explained in early issues of 'AquaLife' but might be strange to some of the readers of 'finchat'. Nevertheless, I feel they are necessary to provide a worthwhile guide to the different species. On the other hand, perhaps a separate article could be written about each of the ten or so species, beginning with the Blackmast (*Quirichthys stramineus*) which is nearer *Pseudomugil* than *Melanotaenia* and was the next one to have been dealt with in the 'AquaLife' series. Please let me know what you think of these ideas.

Yours faithfully,

Gilbert P. Whitley,

Gilbert P. Whitley

THE AUSTRALIAN MUSEUM

College Street, Sydney

Telegraphic Address: MUSEUM

TELEPHONE: BM 6954

Ref. _____

All official communications to
be addressed to the Director

30th July 1959
R.L. Bowman, Esq.,
Editor 'finchat',
49 Chadstone Road,
Chadstone S.E. 10,
VICTORIA.

Dear Mr. Bowman,

I have been sidetracked on all sorts of odd jobs lately and so I must apologize for taking so long to reply to your letter of 12 June and to thank you for the specimen of *Aidaprora carteri* which you kindly presented to this museum (registered no. IB. 4321).

Please can you let me know the locality from which this fish originally came?

Archer fish are found in the rivers of Queensland and the Northern Territory.

I agree with your suggestions regarding future articles on Australian aquarium fishes and I enclose the MSS of my contributions on the Blackmast (*Quirichthys stramineus*) which is the next in line in continuation of the 'AquaLife' series.

This species has never been photographed, to the best of my knowledge, therefore a copy of my drawing of it (enclosed) is the only available illustration, if you decide to publish it.

I do not know of anyone who can take photos of living fish; to get *Quirichthys* it would be necessary to go to the Katherine River, Northern Territory. Appended to the Blackmast MS., I am also sending my article on Melanotaeniidae for your consideration. I have no photos of these but have enclosed some other illustrations from non-copyright books with captions for each. I regret that blocks are not available. *Monodactylus*, Scats and Archer fish could be dealt with in later instalments.

It would be appreciated if you could let me read proofs before publication. I do not require payment for my articles but would like to have, if possible, a dozen copies of each 'finchat' containing any contributions of mine you may accept.

Thank you for the August 'finchat'. The Museum leaflets can be reproduced, provided the customary acknowledgement is given, as you have done for 'Hints for Collectors' in the August issue. Leaflets are anonymous but all the fish ones were written by me.

I may be in Melbourne later this year so might have an opportunity to look you up.

With kind regards,
Yours sincerely,
Gilbert P. Whitley
Curator of Fishes

Telegraphic Address
"MUSEUM"



IN YOUR REPLY REFER TO

No.

TELEPHONES:-
B.056 { DIRECTOR..... EXTENSION 2484
 GENERAL OFFICE " 2485

ALL COMMUNICATIONS ON OFFICIAL
MATTERS
SHOULD BE ADDRESSED TO THE DIRECTOR
AND NOT TO ANY OFFICER BY NAME.

The Australian Museum.
Sydney

8th. October, 1959
Ron Bowman, Esq.,
49, Chadstone Road,
Chadstone, S.E.10,
Victoria.

Dear Mr. Bowman,

I was very pleased to have your letter and the proofs of my article on Melanotaeniidae. I know exactly, from my own experience, the difficulties of editing and attending to correspondence, etc. in the midst of a busy life. I have never been to Katherine River crossing, but Eric Worrell, of Great Ocean Aquarium, Umina via Woy Woy, N.S.W. might be able to advise you as to the best collecting season there.

I am returning the proofs herewith. I have made the more essential alterations in red ink and less important ones in pencil. Brackets () are not required around scientific names in the text. Their presence in the Key doesn't matter. Brackets around the names of authors of species, following scientific names, have a definite meaning in taxonomy and should be omitted only where I have indicated (*) in red ink. However, if much resetting is involved (with consequent risk of other errors creeping in), please leave the brackets where they are. Perhaps an editorial note could explain that italics are not available for scientific names.

I presume you are using the illustrations I sent you last July. I could check the captions and a revise proof of the text, if you like, and if there is time. Please let me know the deadline for the next article you may require from me. If it is to follow the series, it will be quite a short one on Mulletts and Threadfins. After them, we come to the Bass and Perch tribe.

I went to Adelaide and Perth recently but regret that I was unable to get across to Melbourne.

With kind regards,
Yours sincerely,
Gilbert P Whitley



Ron Bowman interviews H. R. Axelrod

MEET THE AXELRODS

by Ron Bowman

All keen aquarists know of Herbert R. Axelrod, the American ichthyologist, who has written and published many books about aquarium fishes, and who is the publisher of the monthly journal *Tropical Fish Hobbyist*.

H.R.A. travels extensively and frequently, collecting fishes from their native pools and streams, and has been responsible for the introduction of many new species to the aquariums of the world.

Mr. A. C. Jones, of Exotic Aquarium Supplies had been most helpful in arranging this meeting, and in allowing us some of Mr. Axelrod's' time in order to record an interview.

Space will not permit a full report of the interview, but I will give you a précis of the sections most likely to interest you.

After telling us of the places visited on the three month tour (England, Germany, Egypt, Pakistan, India, Ceylon, Sumatra, Java, Singapore, Hong Kong, Tokyo, Manila, Australia, then to Fiji, Hawaii and home).

H.R.A. told us of a joint meeting of six N.S.W. societies in Sydney, during which he screened a few hundred colour photographs taken during his recent trip to Brazil, and which included slides of the fabulous new Blue Discus.

(I said, on your behalf, 'half their luck'). H.R.A. promised to send a set of colour slides to show to the A. S. of V. per medium of A. C. Jones, so we look forward to this event.

I asked Herbert whether he had seen any Australian native fishes during his visit.

H.R.A. "Yes indeed, I have seen some wonderful aquarium fishes here, which are indigenous to Australia; unfortunately most of the Australian aquarists pass them off as being ordinary.

But they are only ordinary because they are local.

I was rather thrilled with several varieties – in fact, I would not consider any that I have seen as being ordinary."

I then told H.R.A. of 'finchat's plans to sponsor research on Australian aquarium fishes, obtaining specimens through interstate aquarists, and having fishes identified and photographed.

H.R.A. then expressed the desire that we endeavour to send examples of Australian fishes to him in America for display round American Societies.

This we promised to do (six chequered rainbows, and six Blue-eyes – signifer – are on their way).

I asked why Archer fish, Monodacts, Scats, Glass fish, etc., as found in Australia, are not included in aquarium books as also 'habitat Australia.'

H.R.A. replied that because of the cost of transportation to U.S.A., the majority of these fishes were imported from Hong Kong, Singapore, Ceylon and India, where they are found in great numbers – The Australian sub species are not imported as yet, so are not listed.

I then asked if Herbert knew of any serious exploration of New Guinea streams for fish.

H.R.A.: "If you asked me what one section of the world I thought would really produce some interesting fishes, well I would say New Guinea.

Not only is that my opinion but people, who have fished near there, and have even made small trips into New Guinea, have told me they want to go there and really do a job."

H.R.A. has not had an opportunity to explore the Great Barrier Reef as yet, but hopes to do so one day.

He said it was probably the richest source of marine life in the world.

'finchat' received some very flattering comments from H.R.A., and then he said:

"If you want to do a real service to aquarium keeping then do follow through your plans to publicise Australian fishes, and not only just a picture and, this is the name of the fish, but tell us what they eat, how temperamental with other fishes, type of water they need, breeding habits – give us some real meat."

Marine Aquaria were discussed – "Approach marine fish keeping with care, with extreme caution."

The August issue of T.F.H. describes a new technique of keeping marine fishes, using sub-sand filter and water softening equipment.



L. to R: – Cec Davis (A.S. of V. President), Herbert R. Axelrod, Mrs. Evelyn Axelrod, and Mr. A. C. Jones, Director of Exotic Aquarium Supplies.

Photo by Bruno Hoffmeister

This should prove most interesting to those of us with a yen to keep some of the glorious Barrier Reef marine tropicals.

On treating fish diseases, H.R.A. said – “After all, the treatment of all fish diseases and all human diseases, for that matter, where a parasite is concerned is to give the animal enough poison to kill the parasite but not the animal.”

After a five-way discussion between Herbert, A. C. Jones, Ian Derrick, Fred Parkes and me on the many aspects of marine fish keeping, we thanked Herbert Axelrod for his interest and help, and turned our attention to Mrs Evelyn Axelrod.

Mrs. A. told us that they haven't any tanks at home, because of all the time they are away from home whilst travelling.

They have the fish room at the office (T.F.H. Publications) and: – “Every new employee that comes, before you know it they have a tank, then two tanks, then they have questions for Herbert, and they're in the hobby.”

Evelyn A. loves exploring streams for fishes with her husband, and keenly watches for new types of water plants.

She advises ‘fish widows’ to learn a little of their husband's hobby, so that they can feed the fishes correctly, not killing them by over feeding as she had seen so many disillusioned people do.

In her own words to these ‘widows’ who sit knitting while their husbands paddle with the fish.

“– if you can't beat them, join them, so learn about them.”

I was delighted the following morning when A.C. Jones brought Herbert and Evelyn Axelrod to my fish house to see the two Australian species I had there, and Herbert's interest in them was very obvious, and he left after many reminders ‘Don't forget to send me some of those chequered rainbows and Blue Eyes.’

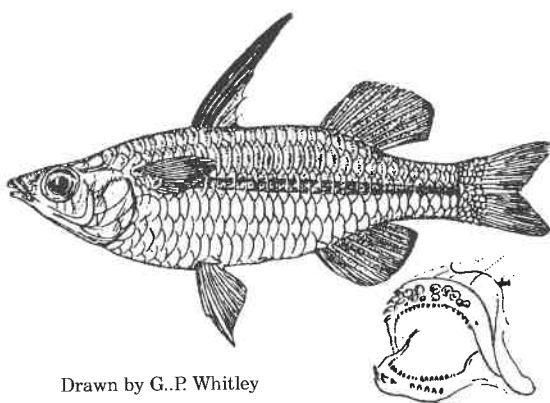
So they were away again, but to those of us who had the good fortune to meet and talk with them, the books that come off the presses at T.F.H. Publications will have a special personal interest, and it may well be that some of the work we are doing in studying Australian fishes, may one day appear in their famous magazine.

FRESH WATER FISHES OF AUSTRALIA

by Gilbert. P. Whitley, F.R.Z.S.,
Curator of Fishes, The Australian Museum, Sydney

THE BLACKMAST OR STRAWMAN *Quirichthys stramineus* (Whitley, 1950)

Inset, lower right, mouth
showing teeth outside
the lips



Drawn by G..P Whitley

This beautiful little fish, which may yet achieve world recognition as an aquarium pet, was discovered by Mr. Eric Worrell in 1945 at the Katherine River Crossing, Northern Territory. At night, hundreds of these fishes would scrape at his legs in the water and could be seen in the torchlight. He travelled many miles along the river by dugout canoe and other craft without encountering the species elsewhere. When he brought specimens to the Australian Museum, Sydney, and to Melbourne Ward's Gallery in the Blue Mountains and I tried to classify them, I found that they belonged to an unnamed genus and species related to Celebes fishes called (*Telmatherina*) and (*Paratherina*). His specimens were straw-yellowish in colour and I named them (*Quiris stramineus*) because of the "*Quirites straminei*" or figures of straw-effigies of Roman citizens - which, used to be thrown into the Tiber in bygone days. I did not know then that someone else had used the name (*Quiris*) for an insect, so the fish had to be rechristened (*Quirichthys*) because no two kinds of animals are allowed to have identical names. I called these fishes Strawmen but Mr. Worrell was more impressed with their black dorsal fins and called them Blackmasts, a name I gladly adopt. They obviously came "in between" Blue Eyes and Sunfishes and had remarkable teeth over the lips outside the series of teeth in the jaws (see above illustration, bottom right inset).

Technical data are as follows:

D.vi-vii/i, 9-10; A.i, 10-11; P.14. Sc.28-29. Tr.6. Predorsal scales 10. Vertebrae 33. Gill-rakers 5/9. $3\frac{1}{2}$ scales between pectoral base and middle of chest. First dorsal fin high, second dorsal and anal fins rounded.

Straw-yellowish, browner above. Most of first dorsal fin blackish, rest white. Eye blue. A silver stripe alongside.

Length 2.6 inches. Northern Territory.

The foregoing fishes belong to the subfamily Pseudomugilidae of the family Melanotaeniidae; A key to the Australian genera of this family is as follows:

A. Vent in. posterior half of distance between snout and tail fin. Caudal peduncle as long as anal base or longer. A,i, 9 to 13.

B. Second dorsal and anal fins elevated – (Pseudomugil)

BB. Second dorsal and anal fins rounded.

External teeth on lips – (Quirichthys).

AA. Vent in front half of distance between snout and tail fin. Caudal peduncle shorter than anal base. A,i, 14 to 30.

C. All the dorsal spines flexible – (Rhadinocentrus).

CC. First dorsal spine pungent, rest flexible.

D. Apart from a few teeth near angle of jaw sometimes, the teeth are not external to lips, which are not thickened. Mouth small, not reaching level of eye. Lower jaw often included. Body deeper.

E. Bands of very small teeth on outside of jaws – (Rhombosoma).

EE. A single row of enlarged teeth along outside of upper jaw.

F. Profiles of head not markedly concave. Mouth reaching front of eye. Fins not darkly chequered – (Amneris).

FF. Profiles markedly concave above and below head. Mouth not reaching eye. Fins dark chequered – (Aidaprora).

The genera and species of these dainty little fishes are difficult to classify because they vary considerably in shape and proportions, fin-counts and other characters. Thus many nominal "species" have been described and named, often by overseas scientists and in various languages and the original "type" specimens, if kept at all, are faded mummies stored in scattered museums.

Freshwater sunfishes change form as they grow, adults being deeper and often more rhomboid than the young. The top profile of the head may become concave, that of the breast and abdomen convex. External teeth are developed on the upper jaw of some kinds, notably in New Guinea genera, hence Professor Max Weber wrote, "Instead of being prehensile, the jaws make scraping movements. I experienced this when bathing in Lake Sentani, in northern New Guinea. *Chilatherina sentaniensis* occurred there in large numbers along the shore, and, when standing bare-legged in the clear water, I could feel and see how the fishes scraped at the skin of my legs." The natural food, of course, is not the extremities of zoologists, but almost any small aquatic animals and fragments of plants. Sun-fishes are great destroyers of mosquito-larvae and have been used in malaria control work.

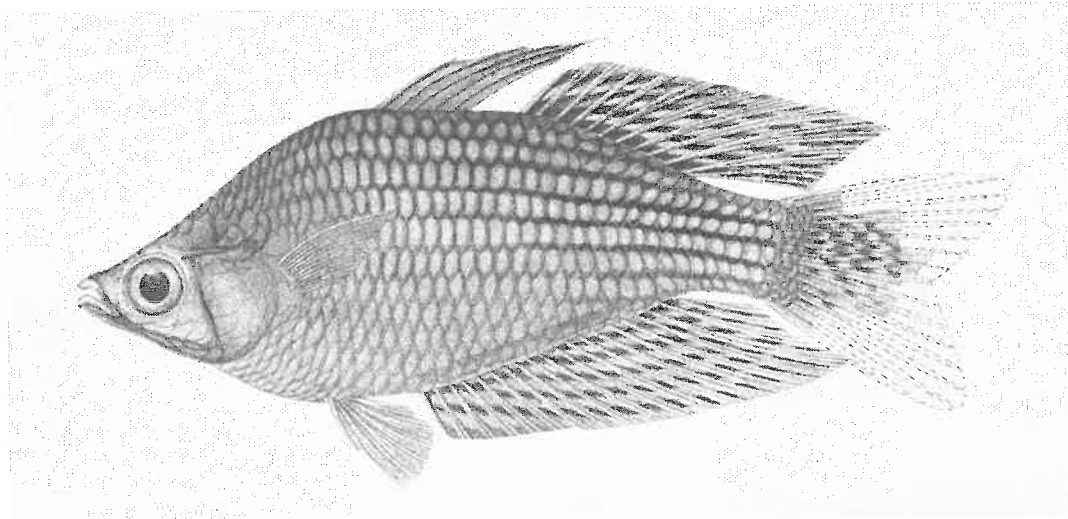
CARTER'S SUNFISH

Aidaprora carteri, (Whitley, 1935)

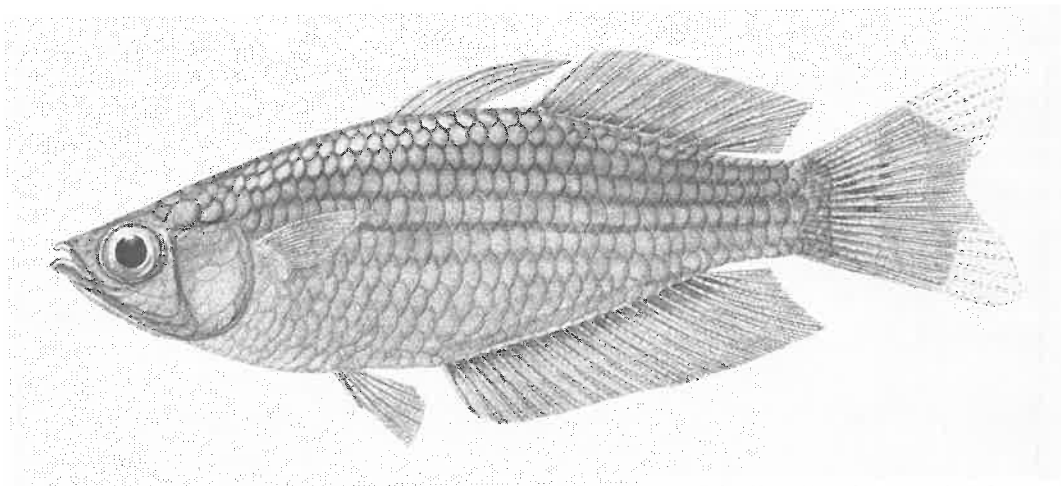
D.i, 4-5/i, 10-12; A.2021. Sc.32-33. Tr.10, 12.

Rarely, a fish will have only 1, 5 or 17 anal rays, and young ones have Sc. about 28, and plain fins.

The illustrations show the characteristic outlines of the male and female fish. Predorsal length 47-50 per-cent of standard length. Outer lateral teeth enlarged. Teeth on vomer, palate and tongue. Anal origin far forward. In alcohol, the colour is yellowish with about ten broad brown and yellow bands from shoulder and head backwards. Some fins black with bold yellow chequers. Eyes blue. 5½ inches. Queensland. Types from near Hughenden. Specimens seen from Clump Point and Lillesmere Lagoon, Q. I named this species after my late friend Alfred Kyrwood Carter, a keen aquarist and most careful painter of fishes, who died in World War II.



Carter's Sunfish, *Aidaprora carteri*, male, from near Hughenden, Queensland.
Drawn by the late A. K. Carter.



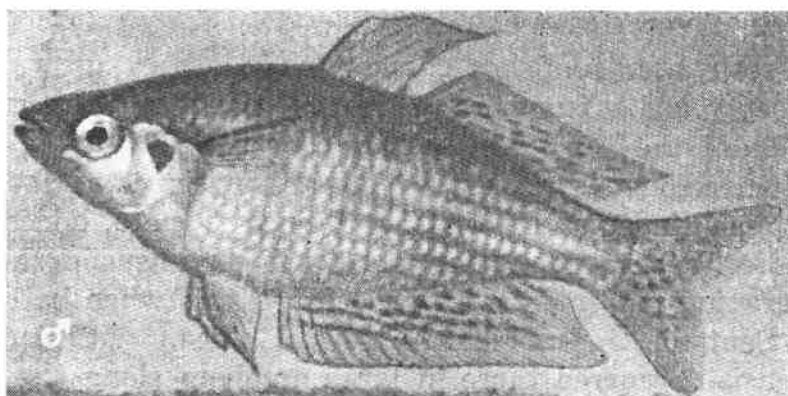
Carter's Sunfish, *Aidaprora carteri*, female, from near Hughenden, Queensland.
Drawn by the late A. K. Carter.



HOW I BREED

THE CHEQUERED RAINBOW

by Ron Bowman



The Checkered Rainbow

Photo by Mrs. Z. Lee

This Australian Rainbow, *Aidaprora carteri*, ranks high among my favourite aquarium fishes.

Perhaps that may be partly a kindred feeling towards a fellow Australian, but when Herbert R. Axelrod saw my breeding pair recently, he was impressed, and is looking forward to receiving some of their fry.

DESCRIPTION:

Chequered Rainbows, when mature, are about 4½ in, but don't let that deter you, for they are perfect community fish. I have never seen them bully other fish – and I have had my 2 year-old pair in several tanks.

The male rarely leaves the female. He swims round her, spreads his fins to salute her, and then relaxes again.

It is characteristic of this species that the two dorsal fins are normally carried in a relaxed position, and are raised much in the way a cockatoo will flare his crest. Whenever the fish yawns the fins are flared also.

The colour of these fish resembles the lace gourami when viewed in the right light.

I must point out that the intensity of colour is fairly constant, but the scales have a reflecting quality which, of course, means that unless some light shines on the aquarium from the front or sides, the fish will appear as grey and would not attract attention.

Small pilot lights of about 15 watt placed each side of the aquarium will pick up this type of colouration, and if you equip your display aquarium with them, you will see colours in your fishes you didn't realize they had.

Well, as I was saying, under the correct lighting, the Chequered Rainbow male displays a pale silvery blue sheen as a general colour along the sides, and the bottom and top of each scale is orange, giving a beautiful laterally striped effect.

The gill plates have a bright orange spot on the silver-blue, and the eye shows the same blue with a trace of orange.

The two dorsals, anal and caudal are clear amber, and strikingly chequered with rusty red flecks.

The female is similarly marked, but of paler hues. She can be recognized from him by her more rounded contours and paler colouration.

These fish, although sometimes found in brackish water in their native North Queensland haunts, are not at all averse to soft fresh water, and definitely do not require any special attention as to salt in the tank.

BREEDING:

I sterilize a 24 x 12 x 12 tank, scrubbing with sea water and steel wool, rinse, and set up with a teaspoon of salt to a gallon of new tap water (Melbourne tap water is the softest) and fill to about 9 inches.

A temperature of 74°F has proved suitable, but I don't doubt that temperatures up to 80°F would suit.

Spawning, medium (boiled coconut fibre, or clean, pest-free *Nitella* or *Ceratophyllum* should cover about three fourths of the tank bottom, and be heaped to leave about an inch clear space between medium and water surface.

Breeding pair may be placed in the tank when temperature is right, or about 12 hours after filling.

The male courts the female, following her over the spawning medium.

I have never seen the eggs actually laid. Each night with the aid of a torch they may be seen hanging from the medium on little strings, like Christmas baubles.

The eggs take seven days to hatch at 74°F, so the breeders may be left in for six days, during which time they may lay up to 1000 eggs.

The young develop to the stage when they can be seen quite black in the eggs.

The breeders will spawn continuously over the six days – looking all the time as though they don't really care.

Small quantities of live food are fed to the breeders each day, feeding at the clear end of the tank.

Breeders out after six days, and the first of the fry will be seen on the seventh day, swimming near the surface.

I have never seen these fry hang on – they seem to be fully developed on hatching, and, though progressive spawnings are hatching over the next seven days, all the fry are either in the eggs or free swimming.

The fry swarm mostly near the surface and enjoy swimming against the current caused by the gentle aeration.

The fry will take infusoria, and substitutes, but some just don't get on and fall by the wayside. I suggest that much of this death rate may be minimised if the eggs are distributed over several tanks – the fry are very susceptible to overcrowding, and eat constantly.

The best fry will grow to 2½ in. in 12 months – and some may still be an inch.

Well there it is.

You now have some busy chequered rainbows – and will you be busy – they eat twice as much and twice as fast as any other fish I know, but boy oh boy, what a party.

T.A.G. GOES NORTH

Much excitement is being experienced over arrangements now being made with aquarists in both Cairns and Townsville for the collection and despatch to Melbourne of North Queensland freshwater fishes and plants. Our sincere thanks go to Paul Kamsler for organising a small trial shipment from “somewhere in Cape York” which arrived in 100 per cent. condition. Such fish, at present under the care of Messrs. Bowman and Hammer, have yet to be identified and a full report will appear in a later issue of ‘finchat’.

Townsville, a more organised group, will, we believe, shortly embark on a serious collection project, under the auspices of and in close co-operation with T.A.G. The success of this project, depends entirely on the support we receive from our northern friends, who will be devoting much time and energy towards the successful study and classification of freshwater fishes. To such active aquarists as Messrs. Martin, Garlick, Edwards, Searle, Stewart and their supporters both T.A.G. and ‘finchat’ say “thank you, and good fishing.”

Telegraphic Address
"MUSEUM"



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The Australian Museum.
Sydney

13 November 1959

Ron Bowman, Esq.,
Aquarium Society of Victoria,
c/o 104 Eskdale Road,
Caulfield, S.E.7, Victoria

Dear Mr. Bowman,

Many thanks for sending me the dozen copies of the November "finchat" which I am very pleased to have. I was very interested in your account of the Chequered Rainbow Fish, and pleased to see my Fresh Water Fishes launched. I am getting along well with later instalments, but presume you will not require anything more for a while until the other Sunfishes (*Melanotaeniidae*) are used up.

I heard Axelrod lecture in Sydney and saw his beautiful transparencies. I am glad he is interested in our Australian freshwater fishes which have been the Cinderellas of overseas aquarists for so long.

With kind regards,

Yours sincerely,

Gilbert P. Whitley,

Gilbert P. Whitley

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

November 16, 1959
Mr R. L. Bowman
49 Chadstone Road
Chadstone SE 10
MELBOURNE

Dear Mr Bowman,

In today's mail I received a copy of the November issue of 'finchat' from my friend and colleague Gilbert Whitley; Gilbert sent it to me since it contained a section of his article on the Australian Rainbow fishes, Family Melanotaeniidae.

In this same issue I note your article on the spawning of the Chequered Rainbow and also several references to growing interests in the native fishes of Australia and New Guinea. Since I have great personal interests in these fishes, particularly the members of the Families Melanotaeniidae and Pseudomugilidae, both as a professional ichthyologist and as a tropical fish hobbyist, it occurs to me that I may be of some small assistance to your society and in particular to the T.A.G.

By way of introduction I should explain that I am ichthyologist of the staff of the Division of Fisheries and Oceanography, C.S.I.R.O. and at the present time am engaged in the description and cataloguing of the marine and fresh water fishes of Australia and New Guinea. As you may know I have been publishing over a period of years the "Handbook of Australian Fishes", a series which appears monthly in "Fisheries Newsletter" published by the Department of Primary Industry, Canberra. Earlier this year I brought out for the Administration of Papua and New Guinea an extensive checklist of the fishes of New Guinea and am now engaged with the preparation of the manuscript of a large illustrated "Handbook of the fishes of Papua and New Guinea". I am rather interested in the speciation and distribution of the native fishes occurring in fresh waters of both areas and am assembling materials for a full taxonomic revision of the Melanotaeniid fishes. To this end I have obtained on loan and exchanged from the principal museums in Europe and U.S.A. original "Type" specimens of all the Melanotaeniids so far known to science. Intermittently over many years I have kept a few tropicals and have been responsible for the running of our salt-water aquarium at this laboratory. Within the last year or two I have become a convert to the cult of keeping and breeding exotic and native tropicals, a hobby which I intend to extend greatly on completion of the fish room that I am now constructing at home.

I have been keeping several species of Melanotaenia and Pseudomugil in my tanks and hope to do something about breeding them when I get more space available. At the moment I have *M. nigrans*, *M. fluviatilis*, *M. maccullochi*, *M. rubrostriatus*, *Rhombosoma affinis* and *Rhadinocentrus ornatus* and hope soon to get *M. carteri* and *R. goldiei* and perhaps some species from New Guinea. Naturally I was very interested in your article on the spawning of the "Chequered Rainbow", which incidentally is a vernacular name which I introduced a year or two ago for *M. carteri*. However, judging from your illustration and colour notes, I am quite certain that this is not the species which you have but that your examples are either *rubrostriatus* or *fluviatilis*, more probably the latter but I could not be absolutely sure without sighting a specimen. *M. carteri* occurs only in some of the rivers flowing into the Gulf of Carpentaria and I am waiting for confirmation of its occurrence also in southern Dutch New Guinea.

I have seen the examples from Lillesmere Lagoon and Glump Point mentioned by Whitley on p.11 but these seem to be only variants of *rubrostriatus*, mostly males with extraordinarily developed colour patterns. This *rubrostriatus* occurs widely throughout northern Australia and in to the Southern parts of Papua and Dutch New Guinea. *M. fluviatilis* is a southern species occurring only in the Murray-Darling and some of the coastal rivers of northern N.S.W. and Southern Queensland. Have you any idea where your examples came from originally?

In all the larger aquarium reference books you will find only two species listed, namely *maccullochi* and *nigrans*. I think that the one usually illustrated as *nigrans* is identical with the fish in your illustration but it isn't the true *nigrans* that was originally described by Sir John Richardson. I have over 60 of the true *nigrans* in one of my tanks but they are the only ones that I have so far seen domesticated in aquaria. They are rather slender fish with a broad black lateral band and their flanks are a striking deep mauve colour. I am trying to trace the origin of specimens of Rainbow fish originally exported to Europe and the States, but no doubt in recent years countless small and large shipments have been exported privately and by the trade so it would be close on impossible to ascertain anything very useful. As far as I can make out the so-called "Northern Rainbow" of Australian dealers is probably *rubrostriatus* and the "Southern Rainbow" is *fluviatilis* mostly collected around Brisbane. Oddly enough *maccullochi* is by far better known to aquarists than it is to scientists.

There are a great number of pitfalls in the correct identification of fresh water fishes native to Australia and New Guinea, and possibly much mutual benefit might be gained if I could have an opportunity to cooperate in some degree with you and others personally interested in the domestication of our native fishes. I can do everything at my end regarding proper identification of any of our native species and would be happy to give an opinion on the identification of any examples, dead or alive, which you or others may care to send along. To the same end you might like to put me in touch with interested aquarists in Townsville and Cairns, who without professional assistance, are bound to run into difficulty with identification of North Queensland species. From my angle, I could hope to extend my own tanks, so that I might both as a biologist and a hobbyist explore the various degrees of hybridization that may take place amongst the species which are zoogeographically isolated in nature.

With best wishes,

Yours sincerely,

Ian S.R. Munro

Mr Ian S.R. Munro
C/o C.S.I.R.O. Marine Lab
Box 21, Cronulla Sydney
NSW

49 Chadstone Road
Chadstone SE 10
23 Nov, 1959

Dear Mr Munro,

I was very pleased to receive your letter this morning and to learn of your interest in aquarium fishes.

You are being rather modest in suggesting that you may be of small assistance to the A.S. of V. and T.A.G. - I have a feeling that you will be kept quite busy.

(The time is fifteen to midnight, so you will please excuse me if this letter is short, scribbled and abrupt - some day when I have some more time I will try to do better. CARTER, THE CHEQUERED RAINBOW which I described in the How I Breed article was identified for me by G.P. Whitley, and I believe he has the preserved specimen I sent him - would it be possible for you to have a look at it at the Aus. Museum? Correct identification of this fish is rather urgent, as H.R. Axelrod, the American ichthyologist and publisher, already has received colour slides and my permission to use my article on this fish. I wouldn't like to see it launched with the wrong name.

During a conversation I had with H.R. Axelrod in his recent visit, he confessed to being puzzled at the variety of names listed by G.P.W. for fishes for the family Melanotaenidae - *Amneris rubrostriata*, *Aidaprora carteri* etc.

I notice you delete *Amneris*, *Aidaprora* etc. in your reference to these fishes - could we have the correct names - and does G.P.W. agree (we have G.P.W. doing a series for us, and it would be embarrassing if the names used are not universally acceptable.)

Is it possible for me to get your published works on Australian fishes?

Have you any colour, or B+ W shots of your nigrans etc. etc. in your tanks.

We have an efficient photographic group and would be glad of the opportunity to photograph true species of Aus fishes as we are largely working in the dark at present - perhaps you may be able to select a couple of breeding pairs of each species you have, and fly them down for us to study, photograph and perhaps breed (fodder for hungry "finchat")

In return, I would be glad to fly fish from our collection to you.

Fish have been travelling very well from Townsville in plastic bags containing 1/4 gallon water + oxygen.

Incidentally, your description of *nigrans* does not tally well with the fish known in Melbourne as *nigrans* - I have some in a tank side by side with '*carteri*' so am keen to know what we have got - and what your *nigrans* look like.

I am intensely interested in the Pseudomugilidae - we have only seen *signifer* and I have cherished hopes of some of the other varieties, as described by G.P.W. coming down to us but no luck as yet.

I suggest that you contact the hon. secretary Townsville Aquarium Club, Box 793, G.P.O. Townsville and give them some information on preserving fish and arrange for despatch to you - you could get the live specimens also from them - they are a very enthusiastic group and you could well short cut our present system in which fishes after photographing etc. eventually return to Sydney for identification.

A thought just occurred – if you felt inclined to join the A.S. of V., (I'll enclose a form in case). We could immediately make you a member of T.A.G. which could give the whole project a boost (the minority interest in Australian Fishes is getting quite a few dirty looks down here.)

As T.A.G. member I could promise you full cooperation from Victoria, Townsville, Cairns and wherever else our searching eye lands. (I have a bloke in T.A.A. seeking out *Quirichthys stramineus* at Katherine River crossing, N.T., for me during the next few weeks.)

12.35, so I'll save the rest for a future letter – look forward to hearing your views on all this –

Yours Sincerely,

Ron Bowman

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

December 10, 1959
Mr. R.L. Bowman
49 Chadstone Road
Chadstone SE10
MELBOURNE

Dear Mr. Bowman,

Very many thanks for our letter of the 23rd. Firstly I would like to take up your invitation to become a member of the A.S. of V. Presumably I am eligible for country membership so I am enclosing together with the application form a cheque for £2 odd which should cover a year's membership as such plus a year's sub. to 'finchat'. Also I would greatly appreciate being a member of the T.A.G. and in this capacity hope that at least I can serve as an authority on identification as well as perhaps in other ways.

So far I have been unable to get into Sydney to look at that fish at the Australian Museum. Even although G.P. Whitley identified your fish as *carteri* I am personally convinced that it is none other than *rubrostriatus*. Whitley described the former as a new species in 1935 but has regularly confused other species with it ever since. Late yesterday afternoon I received some type specimens from the Amsterdam Museum and I now know for certain that the same species also occurs in southern Dutch New Guinea from where it was described under an earlier name in 1908 by Professor Max Weber. I think there is perhaps an even earlier name for this species but that might be rather more difficult to establish. Looking again at your photograph and your colour notes I can see no difference between your fish and a small shipment of *rubrostriatus* which I had flown down from one of the Torres Straits Islands last Wednesday. These have the orange horizontal line along the junction of the scale rows and the red markings on the yellow fins. When they first arrived some had black instead of red on the fins producing the black and yellow chequer pattern which is supposed to be a character of *carteri*. Some of the fish were apparently extremely dark all over when caught. This new lot is much more colourful than the two males which I have had in my tanks for some time. The colours of these two seem to come and go, developing weak red and yellow on the fins but generally having the tonings of the lace gouramy or sailfin molly.

There is absolutely no difference between the genus *Melanotaenia*, *Amneris* and *Aidaprora* (and some others which I could add). The generic name *Melanotaenia* should be applied to the Australian species *nigrans*, *rubrostriatus*, *fluviatilis*, *maccullochi*, *carteri* (which is synonymous with one or two earlier names) and *australis* (I am not fully satisfied whether this is a valid species or only a variant of *nigrans*). Whitley introduced both *Amneris* and *Aidaprora* in 1935 but there is nothing in his original descriptions nor about his specimens to substantiate the acceptance of either genus. He makes much of dentition differences but there are really no basic differences. I have gone into this very fully and taken the trouble to draw in detail the exact arrangement of teeth but our friend is of the old school and does not make too much use of modern microscopical aids. I think too he has been confused by the growth and sex differences and by the various degrees of preservation apparent in the old museum material. I have discussed all this with him but he sticks to his own contentions despite that fellow workers here and abroad are regularly discarding his new and resurrected generic and specific names. Of other Australian *Melanotaeniids* there are *Rhadinocentrus ornatus*, an allied species *rhombosomoides* which I do not think is a *Rhadinocentrus*, *Rhombosoma goldiei* (not officially recorded but known to

occur in Qld.) and *R. trifasciata* (needs further investigation). Incidentally *rhombosomoides* seems to be known only from a couple of museum specimens caught in the Babinda district and is something which we should endeavour to obtain alive from contacts in North Queensland.

Unfortunately I can do nothing directly about supplying copies of my papers on Australian fishes – the most important as far as you would be concerned is the "Handbook of Australian fishes", part 1–30 already published. I had a limited stock of art paper reprints of this series but have now exhausted my supply to fellow ichthyologists overseas. There is a very good chance that you could obtain this series on request directly to the Director of Fisheries, Commonwealth Fisheries Office, Department of Primary Industry, Barton, Canberra. They will not issue their art paper reprints but may be able to supply all or many of the back numbers of "Fisheries Newsletter" (July 1956–December 1958) which contains my series as a supplement. None have been published this current year but depending on departmental negotiations publication will be resumed sometime in the New Year. The Newsletter is available free on request.

It is only during the past few months that I have purchased a good reflex-type 35mm. camera but have not yet got to the stage of obtaining photographs of any of my fish. This is largely due to my temporary arrangement and apparent disorganisation. My hobby has got ahead of me somewhat and I have now got rather too many fishes crowded together and inadequately displayed in temporary quarters. Most of my tanks are either on the floor or variously stacked up in the centre of a room that I am building around them. It will be a few months before I get sorted out properly and get the fish into the larger and better tank arrangement which I am now attempting to assemble. For this reason also I will not promise to send you any live specimens for a month or two – when I can get at things better it will be a different matter.

The *nigrans* which I mentioned in my last letter came from Prince of Wales Island and was the first shipment that I attempted to lift by air – it was sent down mostly by way of experiment and to gain experience in transport. For this reason I specified small to moderate sized fishes. The 60 or so of them are nicely settled in without loss but are awkward to get at, and I would not on account of their youth be absolutely sure of the sexes or hope to select a breeding pair. Soon after Xmas I should have them into a bigger tank where I can see and catch them and at that stage I will be able to cope with sending some on to Melbourne. Most of my *rubrostriatus* are the new arrivals and these too I do not wish to disturb until they are quite settled in and repaired some minor fin damage. Anyway I am sure they are identical with the species that you have been breeding. During last winter I managed to scratch up less than a dozen *fluviatilis* and only a very few *Rhadinocentrus* but both these can be obtained fairly readily from contacts in Brisbane who catch them locally during the warmer months, I have been waiting for the boys to send more down to me but so far have not done so. I think you will find that the species which you call *nigrans* will most likely turn out to be *fluviatilis*. I have now lost the few *Rhombosoma affinis* which were given to me by a Sydney dealer who bred them from New Guinea parents. I have been able to obtain only a single female *maccullochi* and am on the look out for more. Some of these should have come to you from Cairns by now – anyway they are well known to aquarists overseas and I think are now bred commercially in Hong Kong.

In the same trial shipment as the *nigrans* were the 30 or more small *Pseudomugil signatus*. These prospered for a few weeks but eventually succumbed apparently from some respiratory trouble. According to symptoms it could have been gill flukes but microscopic examination revealed none and the wagtails and chanda perchlets in the same tank have shown no sign of infection. I received word from Thursday Island yesterday to the effect that another batch was to be obtained. However I have warned my contact to watch for repetition of this trouble, to make some microscopical examination and quarantine for a while before shipping south. However I can expect to

get the fish within a few weeks and should imagine that you would like to try your experienced hand with some of them. If so, please let me know and I will send a few pairs on to Melbourne. The southern species, *signifer* is readily available here locally but I have not kept any of them recently.

Have any of the people in North Queensland sent in the little spotted *P. gertrudae*? I obtained some in Cairns during the war years when engaged on mosquito control work but cannot now remember just where they came from – whether salt or fresh water. It was only last year that I officially published their occurrence in mainland Australia. Enthusiasts in Cairns should be alerted about their presence in that district and with a bit of searching around they may be able to procure some. There is another small species with green instead of blue eyes discovered near Brisbane within the past 18 months. I have been able to demonstrate that this is a distinct species but have been waiting for the parties concerned to send me their colour notes and also some living specimens.

I hope you have some luck in getting *Quirichthys stramineus* from the Katherine. It should prove to be an attractive aquarium species. Probably Whitley is a bit up the pole about its systematic position. In my opinion the Pseudomugilidae and Melanotaenidae are distinct families and the former is very close to the Telmatherinidae. *Quirichthys* and another little fish *Charisella* found in New Guinea seem to me to belong to the Telmatherinidae which is supposed to occur west of Wallace's Line, namely in the Celebes. This is a bit of a poser in the light of zoogeography but I feel it may be a clue in establishing the ancestor of our modern Pseudomugilidae and Melanotaenidae which are restricted to the east of Wallace's Line, namely New Guinea, Australia and some associated islands.

Thanks for your contacts in Townsville. I will be writing there and will endeavour initially to get some preserved specimens of the local fishes that they are now catching. In the December issue of Finchat, p.14, I see mention of "Jewels". Can you enlighten me any as to which species is meant? Jewelfish and Sunfish are older names apparently now replaced by Rainbowfish for most members of Melanotaeniidae.

There are some other letters which I must attend to so will say no more for the moment.

With best wishes

Yours sincerely

Ian S.R. Munro

Telegraphic Address
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The Australian Museum.
Sydney

8 January, 1960.
Ron Bowman, Esq.,
Aquarium Society of Victoria,
C/o 104 Eskdale Road,
Caulfield. S.E.7, Victoria.

Dear Mr. Bowman,

Thank you for the copies of December 'finchat'. So far I have only received one copy of the January 1960 issue and would appreciate it if you could send me some more for my files and a few special correspondents. Please let me know when you may require further instalments of my "Freshwater Fishes of Australia" and I shall send along another batch.

I have just finished an article on freshwater gudgeons which I am submitting for publication in the June issue of the "Australian Museum Magazine."

With best wishes for the New Year,

Yours sincerely

Gilbert P. Whitley,

Curator of Fishes

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

January 11th 1960
Mr. R. L. Bowman
49 Chadstone Road
Chadstone SE10
MELBOURNE

Dear Mr. Bowman,

Please forgive me for this delay in answering your letter of December 22nd. I have been on leave since December 23rd and have not received the mail which has come to the laboratory until today. Actually I will still be away from work until about the middle of next week but came in today to try and catch up with some overdue correspondence.

I will post this letter at lunch time today so hope I will catch you sufficiently ahead of the 16th regarding the live fishes which you mentioned in your letter. Possibly because of the delay in receiving this note you may have made alternate plans about these natives but if it would still be convenient to get them on a plane this week I would be delighted to receive them.

The last two weeks have been rather hectic on account of the Xmas-New Year festivities of which we seem to have had more than usual socially, three small children at home with school holidays, and at the same time trying to finish the construction of my fish room. The latter project is now fortunately almost complete except for the electrical wiring and if the weather holds as warm as it has been over the past week or two I will have time this week to fit the permanent wiring for the heaters without another temporary untidy hook up. I have finished the installation and painting of the racks and have all but four of my tanks in place all completely cleaned out and reset. It is certainly wonderful to have all this done and the fish up where I can see them. In fact up to the present this is the first time I have been able to get a good look at most of my fishes without standing on my head. Thanks for your offer of assistance with layout but I am afraid that this has been largely a matter of compromise on account of the limited amount of space available to me. We are in a brick area at Cronulla and I have had to convert an existing outhouse which gives me a rather small room only 9'6" x 8'0" high but I have managed to fit in just over 30 tanks in three tiers. The bottom layer is all 18" depth, the middle 15" and the top 10". I do not think that I have wasted an inch and I hope that after the trouble I have gone to the heat insulation and general compactness will show up favourably in my future electric light accounts. So far I have done nothing about floor tanks and I would be very glad of suggestions about these. Most people seem to put in a concrete or brick trough but even those with glass fronts do not appeal greatly to my rather odd taste. What is the general feeling these days about heating? I am still operating on individual elements in glass tubes mostly because I have built up a collection of them in the early stages with them scattered in various places around the house. Probably at this stage it is cheaper for me to add a few more than to convert to some other system which I can not afford at this stage. The room itself is of single thickness brick cement rendered inside and out. The inside walls are insulated with a ½" lining of caneite with a ¾" air space behind it. The ceiling is fibro and the roof corrugated fibro with 4" of insulwool flock. The two roof skylights are double glazed but I might have to introduce an intermediate 3rd layer of glass. The highlights along two sides have normal obscure glass with two spaced inner layers of vinyl film. The floor is concrete varying from 4"-9".

The fish specimens in formalin have arrived safely and I have only had time for a look at these. The Jewel fish are atherines, *Craterocephalus stercusmuscarum*. Whitley has described a very similar species *C. worrelli* from the Gulf of Carpentaria drainage but I am yet to be convinced that it is different. Yours from Townsville are certainly *stercusmuscarum*. The banded perch is *Amniataba percoides* and the spotted perch is *Madaganis unicolour*. Both belong to the Family Theraponidae. I will not have a chance to look at the goby until I get back to work here. The gobies are rather difficult to identify and I will have to give this one a lot of thought. The purple-spotted gudgeon is *Mogurnda mogurnda* of which there are supposed to be two geographical subspecies. The northern one is *M. m. mogurnda* and extends into New Guinea and the southern one is *M. m. pallida* which is an earlier name than *M. m. adspersa* which is in more general use. I am not entirely clear on the subspecific differences and will have to chase these up later. Also I am pretty sure quite a lot of species in this genus certain that the two subspecies (if there are really two) are more or less hopelessly confused in the literature. The feather bream is a species of *Gerres* commonly called silver biddies. There are quite a lot of species in this genus especially in the tropics and I will need a little time to run this one down to its exact species. Incidentally I doubt if this *Gerres* is strictly a fresh water fish. Mostly they occur in estuarine environments but like the Scats and a host of other things may move into fresh water and can probably be acclimatized anyway. I fancy that these kinds of fishes need to pass into reasonably saline water to spawn. By the time you get back from your holidays I should be back on the job at the lab and will have had time to finalize these determinations.

Now about the live fishes. As I said above if you can still get them on a plane this week I will be very glad to have them. There is a 30 x 18 x 14 tank free and I will earmark this to accommodate them. If possible I would like to know about the sort of water they are in at present. The Sydney water that comes through our mains is pretty soft and not perceptibly chlorinated. I have no figures on actual hardness or pH but can get these if you think it greatly important. To date I doubt if I have had any trouble which I would attribute to the water. Like everybody else I have had my percentage of losses but these (amongst new arrivals) have been largely amongst stock I have bought from newly arrived shipments from Hong Kong and Singapore. These fish as you know arrive in Sydney on Friday and are offered for sale on Saturday morning. I must have somewhere between 500 and 1000 fish at present and so far have had no trouble from 100% change of water in the tanks. Probably the important item is your salt content, especially with the blue-eyes, so I would appreciate a note about this either as table salt or seawater per gallon (American). All my Melanotaeniids seem to be quite happy in the water as it comes direct from the tap.

My home address is No.1 Allison Road, Cronulla, (phone 523-4751 if you send a telegram) and as long as I know the airline, flight number and day of dispatch I can always meet the plane at Mascot and save the delay of extra transport into Sydney.

Presumably the purpose in sending this to me is to confirm identifications and for me to make what observations I care to on colouration, etc. Am I to retain these indefinitely for observation on growth, spawning and the like?

Today I checked and found that we have a tape recorder at the lab and that this will be available for my use as required. It is a Pyrox Model ST4 which apparently only runs tapes at 3¾" per second. Would this speed be right for the tapes that you would be recording on?

You will realise that to date I do not know too much about the exact aims of the Australian Native Fishes project apart from the little correspondence we have had. When you get a few spare minutes later on I would appreciate a brief summary of what is being done, and exactly how you are going about making these fish popular with aquarists here and abroad. Is it intended to feature them in individual articles in 'finchat' and/or eventually bring out a booklet (Axelrod's T.F.H. series or something of that type) on the Australian species?

It is now lunch time so I had better get this in the post, I hope you can see your way to send up those fish at this short notice. I have collected all these species myself in northern Queensland and it will be nice to see familiar species swimming around again. In the meanwhile best wishes for 1960.

Regards,

Ian S.R. Munro

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

January 22nd, 1960
Mr. R.L. Bowman
C/- Jandtee Flats
Sheila Ave., Rye
VICTORIA

Dear Ron,

Very many thanks for your letter of January 16th and for your last minute efforts to get the fishes through to me. Fred Parkes sent them off on Wednesday evening and I received them safely yesterday. They arrived in excellent condition despite some unfortunate delay. Apparently he was a little late (4.35pm) in lodging the telegram. This was not phoned through to the lab presumably since the wire reached our P.O. after the laboratory switchboard had been closed. It turned up casually with the mail about 10am yesterday morning. When I read it I naturally thought that the fish would be arriving yesterday (Thursday) evening but something prompted me to read it again and check the time and date of lodgement. To my horror I realised that they had been despatched on Wednesday and presumably had been in Sydney already for more than 12 hours. I immediately got on to A.N.A. and eventually located them at the city freight office. One of our officers had gone to Mascot airport to get another parcel from A.N.A. but I failed to contact him there by a few minutes and had to race into the city which meant that I did not get the fish back here and into their tank till about 12.30. However they are none the worse for their wear except a little pale and travel worn. Just in case of future mishaps it would be a sound scheme to mark the package "HOLD AT MASCOT, PHONE 523-4751". If A.N.A. had my home number they would have called from the airport and I could have had them in their tank within an hour or so after arrival (6.00 pm) in Sydney. I do not know how well you know Sydney but Cronulla is out on a limb a bit more than 20 miles by road from the centre of the city and Mascot airport is about 15 miles between here and the city, and thus a return trip of about 70 minutes against about 150 to the city by car.

By the time I got home from work yesterday the newcomers were looking for some tucker and readily took dry food followed later by a good feed of tubifex. They are now swimming around very normally and are beginning to get back some of their coloration. There are 5 *Melanotaeniids* of which the two you call *nigrans* are definitely *fluviatilis* and the two smaller ones which you call *carteri* are identical with what I consider to be *rubrostriatus*. The 5th is still rather pale and I must reserve comment until it colours up a bit more. I thought your *nigrans* would turn out to be *fluviatilis*. This is an old story and practically everybody is confused. I suppose there is no way of tracing the origin of the ancestors of your *fluviatilis* but probably most of those which get into the hands of dealers come from Brisbane. I know one or two of the dealers in Brisbane and that they catch the wild fish locally and probably send consignments south from time to time. As I said in an earlier note it is still uncertain whether those in the aquarium text books listed under *nigrans* are really *fluviatilis* - at least they are more likely to be this than anything else. When you get back from your holidays I will pick out a few pairs of the proper *nigrans* from my (possibly unique) stock and you will see at a glance that they look nothing like *fluviatilis*. Personally I think that there is little to distinguish *fluviatilis* from *rubrostriatus* swimming in tanks except the colour - the former has crimson red opercular spot and lines and the latter have these orange. The head profile in *fluviatilis* is much blunter. Preserved examples on hand here are up to 5 inches long. I cannot recollect seeing specimens of *fluviatilis* as large as that.

So far I cannot distinguish the two Blue-eyes which you sent apart that two are male and one female. All look very like the northern *signatus*. I have asked our boys here to try and pick up some *signifer* locally in the tidal drains. I do not remember our local one having the series of iridescent spots along the flanks as have the ones you sent and the ones I had earlier from Torres Straits. I do not know what has happened about the new lot from Torres Strait but I am chasing them up again. I take it that you have your stock fully settled in quite fresh water. I would like to know whether all species of *Pseudomugil* move freely from salt to fresh water and whether they can spawn without a reasonably high salt content. The first lot (preserved) sent from Prince of Wales Island (*signatus*) were in very slightly brackish water but when my contact went back a few weeks later to get the live ones the water in the same locality had risen considerably in salt content – far too salty to drink. I collected some of the same species in Cairns during the war years and these were from a fresh water stream well above sea level in the foothills. Despite what others say I do not recall ever collecting *signifer* in anything but brackish to rather saline waters. Tom Marshall who is Government Ichthyologist in Queensland and running an aquarium business in Brisbane as a side line assures me that they occur freely in fresh water but I will not be convinced until I see it with my own eyes. Certainly they can be acclimatised to exist in fresh water but so can scats and mullet and lots of other estuarine species. In your last letter you say that a couple of other members besides yourself have had eggs of Blue-eyes. Are these the same Blue-eyes which you sent to me, namely *signatus*? If you look back to "Aqualife" Vol.2, no.10, p.18 there is a little on spawning Blue-eyes included in G.P.W.'s "Fresh water Fishes of Australia, No.13" This reference is presumably to *signifer* which species I have taken in full roe amongst the *Zostera* growing in very salty water on the shallow flats of Lake Macquarie not more than a mile from the sea. This is back in 1944 and as far as I can remember the fish were not actually spawning but the eggs were fully developed and ready for extrusion. There were atherines spawning at the same time amongst the same weeds. On several occasions I have obtained very small fry (soon after absorption of the yolk sac) further upstream in moderately brackish water. I am rather inclined to think that as far as *signifer* is concerned some salt water is a must and it may need to be in fairly strongly saline water to spawn successfully. The same might not be true for *signatus*.

I am playing in my mind with a little theory that the *Pseudomugilids* along with most of the *Atherinids* are basically marine fish and that the *Telmatherinids* were early in the scheme of things when it came to permanent colonisation of fresh water. The *Melanotaeniids* may have derived from the *Telmatherinidae* rather than direct from the *Atherinidae* or through the *Pseudomugilidae*. Normally the *Melanotaeniids* do only live in fresh water but one species in New Guinea has been reported from brackish water coastal swamps and a few small stragglers of my *nigrans* stock from Prince of Wales Island had moved down with the Blue-eyes into the drinkable brackish water nearer the sea. There is quite a small group of true atherines which seem to live permanently in fresh water – there is one in Lake Eyre and another closely allied to *stercusmuscarum* called *lacustris* living in Lake Kutubu in central highlands of New Guinea. *stercusmuscarum* and *fluviatilis* of the *Craterocephalus* group inhabit coastal rivers but seem to stay in fresh water reaches only. I would imagine that these would not need any salt content at all for spawning. Probably the main requirement would be plenty of fine water plants to which they could attach their eggs. Most of the *Atherinids* and the *Pseudomugils* have fairly large eggs with long sticky filaments similar to those of the garfish. Presumably the eggs are heavier than water and need to adhere to or tangle with fine weeds for support from falling to the bottom and becoming smothered. Incidentally the atherines which you sent appear to be *stercusmuscarum*, the same as the preserved ones. The name comes from Latin *stercus* = dung and *musca* = fly, hence fly specks with the inference to the black specks along the side of this fish.

The carp gudgeon should go by the name of *Hypseleotris compressus* but in most Australian literature are put in the genus *Carassiops*. The genus apparently extends into the East Indies beyond Wallace's line and includes the Java Gudgeons which some of the Sydney dealers have in stock at the moment. I haven't had a good look at the ones you sent because they are still being shy and hiding amongst the weeds. They are almost certain to be *compressus* which is common in North Queensland and in fact widespread through eastern Australia.

Since I got back to the lab I have had a good look at the two preserved fishes you sent in December. The goby is a species of *Stigmatogobius* and this particular one seems rather like *romeri* which is fairly widespread in the Indo-Pacific but not yet recorded from Australia. It seems to be a female but its condition is poor. I have a couple still in one of my tanks – they have got lost and keep turning up again – from Torres Straits. Mine seem to be a different species *javanicus* which also has wide Indo-Pacific distribution and is fairly common in estuaries at least as far south as the Vic-NSW border. Both species I think are essentially marine but both appear at least to enter fresh or very slightly brackish waters. The *Gerres* appears to be closest to *macracanthus* which also has not been recorded from Australia. It is a young fish and I am not certain about some of its characters. The second spine of the first dorsal fin should be very attenuated and its length about equal to the body depth. Also the pectoral fins should reach back at least to the level of the anal fin origin. All are broken off in this specimen. They are things which you would have noticed on arrival from the north so perhaps you can help me.

Thanks for the information re heating and bottom tanks. I cannot place the EZYHEAT – is it anything like the FYRSIDE which is marketed in Sydney. The latter has no wick but a small cylinder with asbestos filler in a groove at the bottom and the flame is spread by a half sphere of copper mesh at the top. We had a sudden cold spell over the past few days and the normal room temperature fell by about 20 degrees. The fish room temperature fell by less than this and the tanks themselves did not drop more than about 3 degrees so I feel that my trouble with insulation has been worth while. The unfinished single glazing on the glass door and one window seemed to be the main weak spots judging by the copious condensation on these parts. This and a third layer in the skylights I think can be fixed with some transparent PVC film.

I am still undecided about floor tanks but I would like to have a look at your details in construction of glass fronted concrete troughs. If I can get to some of these precast aerated concrete blocks they should have better insulation properties. I would like to have something which can possibly be removed and that I can insulate from the concrete floor. We have a small cottage in a central position at Cronulla and now the development around us is flats and home units in multiple stories and I have a feeling that we are being squeezed out. I have to put on some extra bedroom accommodation this year or get out. I am loath to give up the convenience until the rates beat me. For this reason we may have to move sooner or later and I do not feel like spending time and money on construction of permanent work. Anyway I will have to decide one way or the other pretty soon now.

Had better finish off here. I meant to write only a few lines to acknowledge the fishes but seem to have got wound up as usual. You are on holidays so should not even be thinking about fish. Anyway when you get back home and settled in let me know and I will do something about sending down some of those *nigrans*. My colleague in T.I. will be down here at the end of next month so I will work on his enthusiasm to get more live material from Cape York and the neighbouring islands.

With best regards and enjoy the sunshine,

Ian S.R. Munro

January, 1960.

Ron Bowman was embarrassed by a controversial decision of the A.S. of V. committee which instructed him to write to Gilbert P. Whitley to inform him that the committee would no longer provide space in the Society's magazine 'finchat' for the "FRESH WATER FISHES OF AUSTRALIA" series of articles.

The majority decision of the committee was made on the basis that 'A.S. of V. members had insufficient interest in Freshwater Fishes of Australia to justify the continued publication of the series'.

The culmination of the above decision was that the March 1960 issue of 'finchat' contained the final articles:

"FRESH WATER FISHES OF AUSTRALIA"
and "HOW A FISH IS DESCRIBED"

by Gilbert P. Whitley

M1 1871

THE AUSTRALIAN MUSEUM

College Street, Sydney

Telegraphic Address: MUSEUM
TELEPHONE: BM 6954

Ref. _____
All official communications to
be addressed to the Director

29 January 1960.

Ron Bowman, Esq.,
Editor, 'finchat'
Aquarium Society of Victoria,
49 Chadstone Road,
Chadstone, S.E.10, Vic.

Dear Mr. Bowman,

Thank you for your letter of 20th. inst. I look forward to receiving the "finchats" soon, thanks.

I appreciate your trouble with the fin and scale counts and shall keep them to a minimum in future articles. I enclose a brief explanation of the terms used in describing fishes, with a diagram. You might like to print these in 'finchat' to forestall criticism. I also understand why the sequence of articles I had hoped for must be discontinued. I have already dealt with *Craterocephalus* in the old AquaLife, but I am going ahead with the Perches and Scats. By Mouthbreeder I presume you mean the Australian *Glossamia*.

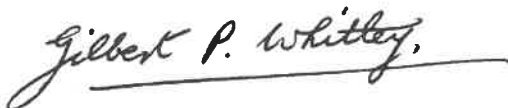
I have recast the AquaLife article on Blue-eyes and enclose this and some illustrations (which I should like to have back later). I have no copy of the figures of *Pseudomugil gertrudae*, unfortunately, but I enclose a list of published illustrations of that species and you might be able to reproduce from one of the references which should be available from the Public Library or National Museum, Melbourne. If you cannot get a figure of *gertrudae*, and must have one, then I could probably get a commercial photographer to copy it here and charge it up to us, but this would take a few days. I am not a photographer myself.

Hoping that you find all the enclosures suitable

and with kind regards,

I remain

Yours sincerely,



Gilbert P. Whitley

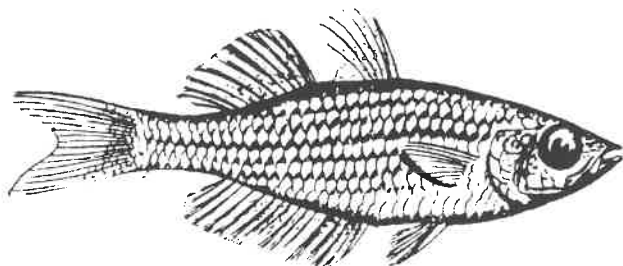
Curator of Fishes.

FRESH WATER FISHES OF AUSTRALIA

by Gilbert P. Whitley, F.R.Z.S.,
Curator of Fishes, The Australian Museum, Sydney

**McCULLOCH'S SUNFISH, QUEENSLAND RAINBOW FISH,
DWARF RAINBOW FISH, OR "ZWERGREGENBOGEN FISCH" OF
GERMAN AQUARISTS.**

Melanotaenia maccullochi, Ogilby, 1915



From the Cairns district,
Queensland.
Named after the late
A. R. McCulloch

This lovely little fish is known to some fanciers as the "maccullochi." It was named after my late teacher in ichthyology, Allan R. McCulloch (1885-1925), and was discovered in the Barron River, inland from Cairns, Queensland. In 1935, examples were exported to Germany and Fritz Mayer, in a Brunswick aquarium journal (Woehenschr. Aquar. Terr. 32,21, May 1935, pp. 321-322 & fig.) gave the first account of its breeding, translated and elaborated upon by F. H. Stoye in Innes' "The Aquarium" v,8, Dec. 1936, with another illustration.

Stoye described the colour as "a shiny grey-green with a blue cast, the ventral section being lighter. Seven more or less distinct red-brown horizontal lines are on the sides. The male is more highly coloured; the ridge of his back and the margin of the anal fin are bright red to dark brown, his breast and pectoral fins are brick red. When feeling well and during mating, the male appears to be steeped in red. The forehead is greenish, a red spot in a green field graces the gill-covers - The Dwarf Australian Rainbow Fish is omnivorous and demands very little from its owner. Live and prepared foods are readily eaten."

According to Mayer, the spawning act occurs during the early morning hours, preceded by vigorous driving by the glowing male. He presses against the side of the female and, accompanied by heavy trembling of both fishes, an egg is expelled directly against the plants. The eggs are fairly large, light yellow in colour and hang by a fine thread. After two or three days the transparent young hatch, first hanging as hardly visible streaks on plants or glass. After several days they are swimming freely, resting near the surface and eat infusoria or fine artificial food. When properly fed and kept at 73 to 74 deg. F., the youngsters grow rapidly and are full-grown in three to four months.

The female is smaller and paler than the male. C. R. Darton (Aqua Life ii, 3, March 1957, p.3) says she lacks the large, black-edged dorsal and anal fins of the male; he also stated that the species will live quite well as far south as Melbourne all the year round in an unheated aquarium, if kept indoors during the winter months, and will mix with any variety of fish of similar size.

Di.4-5i,8-10; A.i,14-16. Sc.29-32. Tr.9-10.

Predorsal sc.12-15. Predorsal length 44-48 per cent. and depth of caudal peduncle 10-13 per cent. of standard length.

Grows to 2¾ inches, native of the Cairns district, Queensland, but now widely domesticated as an aquarium pet and even crossed with *M. nigrans*.

THREE-STRIPED SUNFISH

Rhombosoma trifasciata, Rendahl, 1922

D.i,4-6/i, 14; Ai,19-20, Sc.31-34. Tr.12. Predors.12-15.

Predorsal length about 44 per cent. of standard length.

Mouth reaching eye. Lower jaw included. Small teeth outside upper jaw, no enlarged external ones. The outline of the body is rather like that of the Archer Fish (*Toxotes*). Colour (in spirits), light brown, with a broad blackish bar along each side, bordered above and below by a whitish bar; predorsal midline dark-coloured. Four inches. Yam Creek and Mary River, Northern Territory.

BABINDA SUNFISH

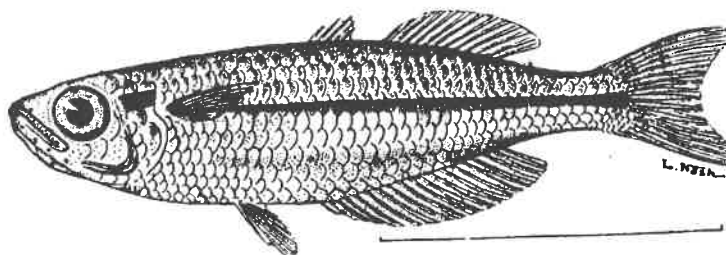
Rhadinocentrus rhombosomoides Nichols & Raven, 1928

FRESHWATER SUNFISH

Rhadinocentrus rhombosomoides Holotype,

from Babinda Creek,
Queensland.

After Nichols and Raven



D.5-6/13; A.17-19. Sc.34-38.Tr.11. No pungent fin-spines. Fine teeth in a band exterior to mouth-opening. Mouth larger and depth less than in (*Melanotaenia*) of similar length. Predorsal length 49 per cent. of standard length.

Silvery with a single black band along middle of side from eye to tail. Length 3 inches.

Cairns to Babinda Creek drainage, North Queensland.

Key to the Australian species of (*Melanotaenia*).

A. Body not conspicuously striped. A.i,16-22.

B. Predorsal length more than 46 (mostly 48-50) per cent. of standard length; and fin begins at about same level as first dorsal origin. Depth of caudal peduncle rarely less than 12 to 15 per cent. of standard length. North-western Australia to Queensland – (*Melanotaenia nigrans*) Richardson 1843.

BB. Predorsal length less than 46 (40-45) per cent. of standard length; anal inserted below middle of first dorsal. Depth of caudal peduncle rarely more than 9.5 to 12 per cent of standard length.

Murray-Darling River-system and captures – (*M. fluviatilis*) Castelnau, 1878.

AA. Body with conspicuous blackish marks between scale-rows forming stripes. Anal usually with less than 18 soft rays, its origin below posterior half of first dorsal fin. Predorsal length 44-52 per cent., depth of caudal peduncle from 9.5 to 13 per cent. of standard length.

C. Black stripes on upper and lower parts of sides from head to tail. Ai,14-16. Northeastern Queensland – (*M. maccullochi*) Qgilby, 1915.

CC. Black stripes on lower posterior parts of fish. A.i,16-19. North-western Australia – (*M. australis*) (Castelnau, 1875).

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

4th February 1960
Mr. R. L. Bowman
49 Chadstone Rd
Chadstone, S.E.10
MELBOURNE

Dear Ron,

Got your letter OK, yesterday but after a lot of consideration have decided not to send on any *Melanotaeniids* to you this week. To dispatch them means a special trip into Mascot and the waste of an afternoon from work and things are a bit difficult here just now; the two main projects that I am working on have political implications, and I am having trouble keeping up the pace of production. Last year I spent full time on the New Guinea handbook but this is a colossal undertaking and is still only half completed. The production of the monthly issues of the Australian handbook was interrupted for 12 months so that I could get the N.G. Book out of the way but I have now got to resume production (beginning March) of the Australian book as well. This means meeting a dead line each month and I am entirely on my own to cope with the research on the species I am dealing with as well as the art work.

Also at this stage I can send only *nigrans* and I would rather wait until I can make the consignment a bit bigger. If I get a chance during the weekend I will go around a couple of the dealers and see if I can pick up a few *maccullochi* for you. I would have thought that these would be already familiar to you enthusiasts in Melbourne. Also I am fairly certain that I can get some *Rhadinocentrus ornatus* from Brisbane so will try and find time to write for them today. I want some more of both species for myself anyway because I have only one female *maccullochi* and 3 rather small retarded *ornatus*.

Another snag has turned up. This concerns the identification of the fish I have thought to be *nigrans* and I do not want to send examples to you labeled as this species until I can confirm my doubts. During the past few weeks that I have been able to observe my fishes properly I have been beginning to wonder about the possibility of these being *Rhombosoma goldiei* rather than *Melanotaenia nigrans*. Yesterday I looked over my preserved material from the same place of capture and find that at least some larger specimens have the teeth characteristics of the genus *Rhombosoma*. This is upsetting as I thought at long last I had run *nigrans* to earth. None of my so thought *nigrans* have died so I have not been able to preserve one for comparison or examine it under the microscope - I have no intentions of killing one deliberately. It is very difficult to be sure of identification of preserved specimens of this group as the critical features or colouration fade very quickly. I have had freshly preserved examples of *goldiei* from streams flowing into the Gulf of Carpentaria and they were in spawning colours with brilliant orange stripes and unspotted brilliant orange fins and have been unable to reconcile this with the pale yellow fins and black checks of the live ones on hand. There are a lot of problems associated with the specimens available to me for study and I cannot explain the ins and outs of it all at this stage. If I could sit down beside you with these puzzling series of specimens you could get some idea of the points that are really bothering me.

Just to be even more difficult I am having more thoughts about *carteri* and *rubrostriatus*. I am still not really satisfied about these two forms. The ones I have at home which came from Badu are now colouring up well and it is not beyond possibility that these may turn out to be *carteri* rather than *rubrostriatus* as I thought formerly.

This also applies to yours. The aquarium bred ones which you sent seem to be doing well and the larger female is beginning to colour up better now.

In your article on the breeding of these you say that the caudal fin is amber with red spots. In mine it is lemon yellow with black checks which seems more like true *carteri*. A single male which I bought in Sydney last year which was supposed to have come from Townsville has a bright red caudal fin with yellow checks - I do not really know whether this is a *rubrostriatus* of wild stock or whether it is a hybrid with something else.

In my earlier letter I asked you about the origin of your breeding stock of *carteri* but you did not tell me. All you said was that the live ones were aquarium bred. I am just interested to know whether it could have come from Townsville or somewhere else east of the Great Dividing Range or whether you got your original pairs from a friend or dealer with no information about origin. Both *carteri* and *rubrostriatus* have been living happily in people's tanks for years.

At this stage I badly want to get hold of large live specimens of the *carteri*-*rubrostriatus* group from eastern Queensland, probably from round about Townsville so that I can check to my own satisfaction about the red and yellow tails. Have you received any from your contacts there to date? Am afraid that I have not written direct to these folk yet as you have suggested but will do so during the next few days.

While on this subject can you give me any contacts either in Bundaberg, Maryborough or Rockhampton? I am strongly of the opinion that *rubrostriatus* in coastal Queensland has also been confused with *fluviatilis* which occurs through coastal Queensland somewhere north of Brisbane probably to the Mary or Burnett. I want to establish whether the Burnett or the Fitzroy is the change over from *fluviatilis* to *rubrostriatus*. This could be extremely important especially in disposing of names like *splendida*.

I hope to get into the Australian Museum for a few days very soon to look over their material once more. However all the answers are not to be found in discoloured faded and dehydrated pickled specimens on dingy dusty museum shelves. The way I feel now is that most of it is going to be solved in Aquarists' tanks but that is going to take time and means making lots of contacts. All I hope is that you will remain patient with me for a while about these Melanotaeniids. I have lost a lot of sleep over them already but I think that I am getting nearer the answer than our predecessors did, (or didn't).

Have been chasing up the Blue-eyes from Thursday Island. They are there OK and are being held in quarantine as there seems to be something killing them off - apparently they die of starvation either through loss of appetite or are physically unable to eat because of some parasite. Hope to have more information about them soon.

Will chase up these other fishes and let you know when I can manage to send on a batch to you

Regards

Ian S. R. Munro

FRESH WATER FISHES OF AUSTRALIA

by Gilbert P. Whitley, F.R.Z.S.,
Curator of Fishes, the Australian Museum, Sydney

COMMON FRESHWATER SUNFISH OR SPOTTED SUNFISH

Melanotaenia nigrans (Richardson, 1843)

John Gilbert, the ill-fated companion of Leichhardt, discovered this fish at Port Essington, Northern Territory, where the natives called it Yalgurnda. This is the "Australian Rainbow Fish" of overseas aquarists, the Regenbogenfisch of the Germans D.i, 4-6/I, 9-13; A,i, 16-23. Sc.31-37. Tr.10-13 (increases with age). About 16 predorsal scales.

In adult males the depth of the body is comparatively much greater than the females (from $2\frac{1}{2}$ - $2\frac{3}{4}$ in total length instead of about 3 in females). The profile of the back in males is more convex than in females; the caudal peduncle in the male is a little deeper than long, in the female a little longer than deep. Some of the finrays are prolonged in adult males only. The posterior margins of the females' fins are rounded. Efforts are being made by aquarists to breed fish with more extensive finnage from domesticated stock.

Olivaceous above, silvery below. A blackish lateral band typically present or replaced by a bluish stripe. Sometimes there are silvery-white stripes along the series of scales and dark red, wavy yellow or brown ones between them. Fins plain or spotted, but in the breeding season the dorsal fins of males may be blackish. Often a bright orange or pink spot on operculum. Grows to 5 inches, but rarely exceeds 4 inches.

This Sunfish has been reported from every State of the Commonwealth except Tasmania. However, intensive research indicates the existence of separate species (as keyed above) and there may be local strains or races. True (*nigrans*) came from the Northern Territory; (*splendida*) (Peters, 1867), inhabits rivers of Eastern Queensland; (*tatei*) Zietz, 1896, was from Central Australia; and from New Guinea comes (*M. nigrans loriae*) (Perugia, 1894). These are regarded as synonymous with (*nigrans*) which thus ranges from north-western, northern and central Australia to Queensland, Papua and the Aru Islands.

Sunfishes prefer clear pools with water-plants, rather than muddy or turbulent river-waters. The eggs are laid on plants at the rate of 10-20 each day and the period of incubation is about 54 hours at 76 deg. F.

In Australasian AquaLife (i,1,1955,p.14; i,4,1956,p.2) the editor, Mr. C.R. Darton, described how the males swim alongside and close to the female, but very slightly to her rear performing the milting and fertilization without actual driving. *M. nigrans* pays no heed to time of day for mating - spawning continues for many days - within a day or two the eggs darken and in the next days the movements of embryos can be observed. A favourable breeding-temperature is about 80 deg. F. Hatching should be in 7-10 days.

Mr. Darton continued: "The embryo seems almost to reverse the development of most other fry; the tail and internal organs apparently form a stage later than do the eyes, an enormous mouth, and the rudimentary swim-bladder; then, within a day or two, the rest of the organs are clearly seen - this process is observable over a period corresponding to the spawning-time allowed - the fry quickly become free-swimming and hungry.

"Feed them on the usual infusoria-larvae-daphnia formula, and follow with a good dried food. Try to separate the larger fry from the smaller, and remove them in batches. In this way losses will be minimized, for until they have made their rather slow progress to the $\frac{3}{4}$ inch stage these fishes do not take changes kindly."

MORETON ISLAND SUNFISH OR PORTHOLE FISH

Rhadinocentrus ornatus Regan 1914.

Originally discovered in a pond on Moreton Island, South Queensland, but since found on Stradbroke Island and in northern New South Wales, this little beauty soon attracted the aquarists' attention. Mr. H.E. Finckh, in 1924, bred from Bellinger River examples in his Sydney aquarium; some of the young grew half an inch long in three weeks as a result of good feeding. Earlier, Mrs. P.R. Messmer had found that they grew more rapidly than (*Melanotaenia*) and reached 4 inches in length.

D.4-5/10-12; A.18-20. Sc33-35. Tr. 8 or 9. Mandible protruding beyond upper jaw when mouth is closed. All fin-spines weak and flexible. Three rows of scales between lateral row and base of anterior dorsal rays. Predorsal length 51 percent. of standard length. Colour olivaceous to bluish-silver, with a row of iridescent ("neon"-like) blue spots along a strip of scales near the back. Two black stripes and some row of black spots along sides. A dark spot at base of each ray of soft dorsal and anal. Fins orange with black margins or dorsal sometimes with a wine-red tinge.

FRESH WATER FISHES OF AUSTRALIA

by **Gilbert P. Whitley, F.R.Z.S.**
Curator of Fishes, the Australian Museum, Sydney

BLUE-EYES

Blue-eyes belong to the genus (*Pseudomugil*) and only grow to about two inches in length; they are active, adventurous little beauties, often occurring in dense swarms, pursuing mosquito-larvae and other food in drains, swamps and shallow, sometimes even polluted water. Several species have been named from New South Wales, Queensland, the Aru Islands and New Guinea. The typical species is (*P. signifer*), first discovered at Sydney in the 1860's by an Austrian expedition, and now known from southern Queensland to southern New South Wales. This is not black-spotted when young as in (*signatus*), a northern Queensland form. On some of the islands off the Queensland coast, as well as the coastal mainland a subspecies, (*P. signatus affinis*), with more anal rays, is found.

Another Queensland species of Blue-eye is a beautiful blackish-spotted fish, Gertrude's Blue-eye, (*Pseudomugil gertrudae*) Weber, 1911. It has L.lat.330, with a black band along sides. Length $\frac{3}{4}$ to $1\frac{1}{4}$ ins. Cairns district and Aru Islands. Named (*gertrudae*) after the wife of Dr. Hugo Merton, a scientist who visited the Aru Islands, off New Guinea.

Key to the Australian Blue-eyes

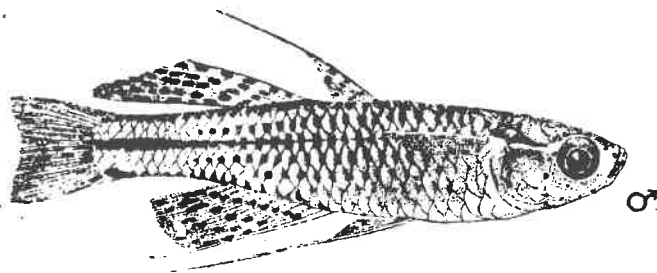
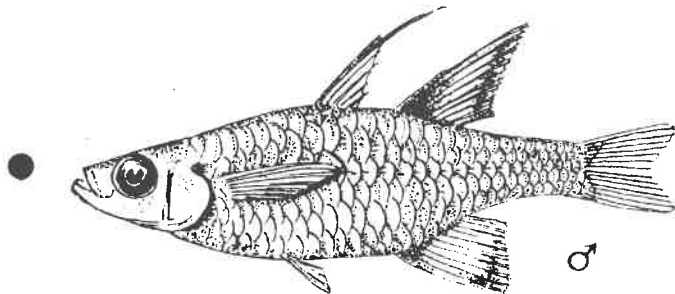
1. Second dorsal fin with 8 or less rays; anal with usually less than 11 rays. Small ones not dark-spotted (South Queensland and New South Wales) *Pseudomugil signifer* Kner, 1866.
2. Similar to above but 5 or 6 dorsal rays. Black band along side; black spots on body and in males on fins too. L.lat.30 (North Queensland) *Pseudomugil gertrudae* Weber, 1911.
3. Similar to above but small ones dark-spotted on dorsal and caudal fins, sometimes on body too. Large fish with about 6 rows of dark spots along scale-rows. L.lat.28 (North Queensland) *Pseudomugil signatus* Gunther, 1867.
4. Second dorsal with more than 8 rays; anal with 12 or more rays. L.lat.28 (North Queensland) *Pseudomugil signatus affinis* Whitley, 1935.

There may be another, so far unnamed kind in southern Queensland.

The male Blue-eye has fins longer than the females - and when excited has a coppery-gold tint. The adult male (*signifer*) is olive to yellowish-green above, canary yellow below; the caudal peduncle tinged with red. There is sometimes a broad dark band from pectoral to tail. First and second dorsal spines long and pure white, though blackish at base - rest of the fin olive-green. Second dorsal with front and exterior margins black, rest of fin scarlet; anal similar to second dorsal. Caudal scarlet, the outer rays, tips of lobes, and sometimes also central rays blackish. Pectorals olive-green, with upper rays black. Ventrals bright yellow. Lips sometimes black. As the name indicates, the eyes are a beautiful blue. Females are more quietly coloured.

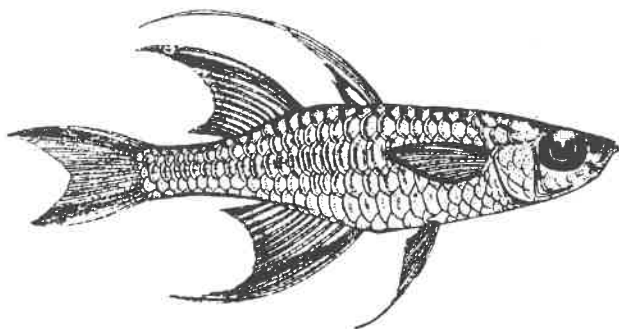
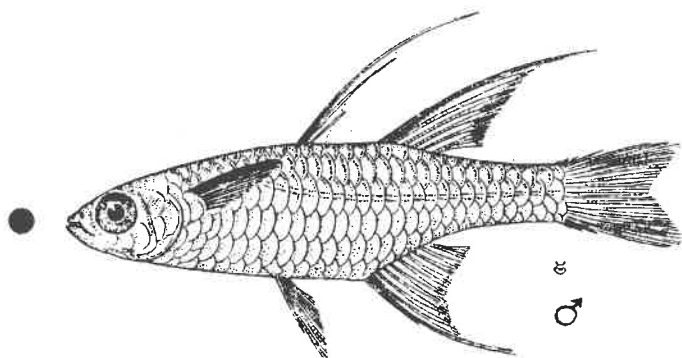
The Blue-eye of the Sydney and Brisbane districts (*P. signifer*) long ago became popular as an aquarium fish both here and overseas. As long ago as 1934, a coloured plate of it appeared in the National Geographical Magazine vol. lxxv, p.100) and a

1. *Pseudomugil signifer*.
From Sydney, New South
Wales after Kner.



2. *Pseudomugil gertrudae*.
Type from Cairns district,
Queensland.
Male is illustrated.

2. *Pseudomugil signatus*.
Type from Cape York,
Queensland.
Drawn by Colonel W. Tenison



2. *Pseudomugil signatus affinis*.
A male from Low Isles
Queensland.
Drawn by G. P. Whitley

German aquarist, Fritz Mayer, dealt with it in Woehenschrift Aquar. Terr. li, 1936, 9.803, with original figures. Mayer having been inspired by the accounts he had heard from another German, Mr. A. Rudel, of Brisbane, and the receipt of a pair of Blue-eyes from Herr Riemenschneider. His Blue-eyes preferred a temperature of from 23 deg. to 25 deg. C., losing their vivacity in 20°C.

The eggs are large and in aquaria, the male has been seen to drive the female into a sandy corner, where the eggs were laid on the sand (not on water-plants) and sand grains covered them.

The Northern Blue-eye, (*P. signatus*), is silvery to yellowish, with the prolonged parts of fins blackish, also margins of second dorsal and anal. Edges of upper scales dusky, and often a dark stripe along the side. The young are yellowish-brown with dark spots or chequers on dorsal and caudal fins. A black band along middle of sides with a similar but shorter dark band above and below it on caudal peduncle. About six rows of dark spots along the scale rows, fading out posteriorly. Sir Hubert Wilkins, the famous explorer, obtained some beautifully spotted juveniles in the Olive River, Cape York Peninsula, and I have caught plainer coloured ones amongst mangroves at Bowen.

The form I have called (*affinis*) was very common at Low Isles (Q'land) amongst mangrove roots, where I noted the colours as olivaceous above, each scale with a darker edge, becoming white on sides and belly. A brownish lateral band posteriorly and some black spots on sides, anteriorly. A medium dark line along back. Head bluish-silvery with a red flush on operculum. Eye blue, with black pupil. First dorsal olivaceous, the spines darker. Second dorsal largely orange-yellow, with some front rays and their membranes blackish. Anal rays smoky, the fin with a white margin. Upper pectoral rays blackish, rest of fin white. Median portion of caudal yellow; some upper and lower rays blackish with the top and bottom of the tail white-edged.

Mr. Len Aldridge, president of the Queensland Amateur Piscicultural Association, has kindly supplied me with hints on the keeping and breeding of Blue-eyes (*Pseudomugil*) and Sunfish (*Rhadinocentrus*) in aquaria. I am thankful to him for his notes.

Mr. Aldridge had several unsuccessful tries at getting Blue-eyes, from a tidal stream near Brisbane, to breed in captivity. He prepared a 24 x 12 x 12 (inches) tank with tank water, into which he put ½ lb. of common salt and planted the tank at one end with Val and Myriophyllum, and caught another three pairs of Blue-eyes.

To continue in his own words: "I also brought back some plants, which I put into a spare concrete tub (to hold), until I had time to treat them. The fish I put into my already prepared tank and fed them plenty of mosquitoes. After about a week they settled down and I separated the males and females. I really fed these fish all the live food I could get – mosquitoes and tubifex worms. A week later I put a pair together ... These fish went through all the actions of a breeding pair but I found the female dead the next morning. Pair No. 2 did likewise, only they spawned and the female died in the attempt. No. 3 pair same as No. 1. At this stage I was prepared to give the game away. I even went as far as cleaning out the tank and changing the plants for (efforts to breed) another type of fish. Now we return to the plants which I had brought home when I got the fish. You can imagine my surprise, when I pulled some plants out of the tub, to see small fish swimming about. Four of them were Blue-eyes about 1 in. long. The spawn had been on the plant when I brought it home.

"Well, someone had once said to me that if you want to transplant a tree you don't get one that is old and deep-rooted, you get the young small tree and it will transplant and grow. So I had four Blue-eyes which had never lived in their natural element. These fish I cherished. I fed them with micro worm, mosquitoes and then tubifex worms. In about six months they were up to breeding size and ready to go: three males and one female.

"I tried a pair in the same water they had lived in all their lives, but no go. Then I came back to the salt angle ($\frac{1}{2}$ lb. to the 24 x 12 x 12 tank) – sure enough, off they went. The male does all the chasing and the eggs scatter like the danios; as a matter of fact the eggs are like those of the zebra danio in size and appearance. About forty fish hatched and I fed them on micro worms and live meal mixed in water, then when large enough, tubifex worms and mosquitoes.

Since then I have had no trouble in breeding the Blue-eye, but only from my own stock, in a 24 x 12 x 12 tank. I have since discovered that, with wild fish straight from the creek, if you put them in a large outdoor pond well planted, they will breed, but every time I try in an ordinary tank, the female gets killed. Last year I bred some three hundred Blue-eyes and now any fish I wish to breed I can in time breed in captivity.

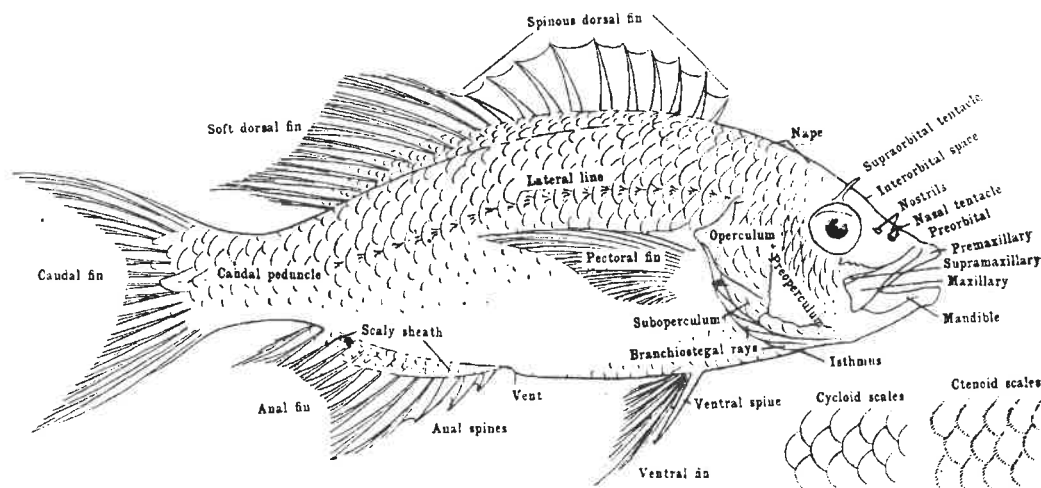
For the benefit of anyone trying to breed these fish, may I suggest that one of the two following methods be adopted. Firstly get the tank ready, not forgetting the salt and rainwater, as far as this State (Q'land) is concerned anyway. Get the fish as small as possible; if you can get the spawn so much the better. Condition the fish on as much live food as possible. Plant the tank thickly at one end, about one-third the tank length, and put about three gallons of acid water made from either peat-moss or wattle bark in the tank, before topping up with ordinary rainwater: this I found is a must.

"The other method is to get a pair of Blue-eyes and put them in a large outdoor tank, throw in some wattle roots and plant one end with any fine plant. After you get the first lot of young, you can guarantee every pair to breed (in any aquarium). The fish, well fed, will breed in six months. I have male fish 12 months old, $2\frac{1}{2}$ inches long.

"Since breeding the Blue-eyes, I have bred the (*Rhadinocentrus*) the main thing in any of these fishes is to get as near as you can to Nature, which means, among other things, Food."

HOW A FISH IS DESCRIBED

by G.P. Whitley



The various parts of a fish are as labelled in the accompanying figure. Since fins may be broken, the "standard length" of a fish is taken from the tip of the upper jaw to the hypural joint, i.e. the fold at the base of the tail-fin when the fin is bent sideways. The number of spines and rays in the fins and the number of scales on the body are important and are expressed as formulae which are quite easy to understand, though they tend to daunt readers unfamiliar with them. The fins are D., A., P., V., and C. (dorsal, anal, pectoral, ventral and caudal or tail) and the number of their hard spines is given in Roman figures and the number and rays, a stroke (/) is used. Thus the fin formula of the anal fin is often divided to look like two, but is counted as one. If the spines and rays are joined together by membrane, a comma is used to separate the figures; if there is a gap between spines and rays, a stroke (/) is used. Thus the fin formula of the imaginary fish shown in this diagram would be:

D.x, 11; A. iii, 10; P.15; VA, 05; C.14 plus two small rays above and below. So, you see, in one line of figures we can give quite a lot of definite information, instead of vague statements.

The scale formula is obtained by counting the scales along the "lateral line" which usually shows as a row of tubes. In the example figured this would be expressed as "L. lat. 2W". Some fishes have a few small scales on the root of the tail but these are usually not counted behind the hypural joint. Some fishes (herring, mullet, etc.) have no lateral line tubes evident, so one counts the scales between shoulder and tail where the lateral line "ought to be" and expresses the result as Sc. 29 or whatever the number may be. Another scale-count is the "transverse line" (L.tr. or Tr.), found by counting the scales down one side of the body from the first dorsal spine to the middle of the belly. In our diagram, we might find "L.tr. 4/1/10," there being four rows of scales above the Wat. row and, say, 10 rows of scales below it. Predorsal scales (Pred.sc.) are those in a line along the top of the head in front of the dorsal fin.

The proportions of the head and body and their parts have to be noted in descriptions of fishes. The teeth are of many forms. Scales may have their margins smooth (cycloid) or finely toothed (ctenoid). The gill-arches have a number of strainers, called gill-rakers, on them and these are sometimes important in classification. Then there are the internal organs - the ichthyologists require so many details, but the above bare outline may help aquarists and students to understand some of the "shorthand" descriptions which convey so much information in a little space, and in the long run, lessen confusion.

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

R.L. Bowman, Esq.
49 Chadstone Road
CHADSTONE, Vic.
AUSTRALIA

28th April, 1960.

Dear Ron

Suppose you have given me up as lost by now but eventually I get around to everything. There are two little matters connected with you that have been on my conscience for some time.

Firstly is the matter of the fishes which I promised to send ages ago. Have after much deliberation decided that my little fish from north Queensland are identical with the Papuan species *Rhombosoma goldiei*. I remember that I said at first that they were *Melanotaenia nigrans* first described from Port Essington, N.T. Actually they are all the same but I would rather you forget this and just think of them as *Rhombosoma goldiei* until I get around to publishing my taxonomic revision of the Australian and New Guinea "Melanotaeniidae". Behind this little discovery is a real hornet's nest of trouble as a whole string of nomenclatural changes within the family will be required. All this is best put aside until I can explain the whole situation in some scientific periodical and properly establish the status of these and various other names.

Did have a chase around Sydney and raised the odd pair of *maccullochi* but they are rather small so will keep them for a while to see what sex they turn out to be since I want a male to mate with my old female. Have been in touch with Frank Lewis in Brisbane and he says he has about 40 fry but had sent the parent breeders to Hong Kong, otherwise he would have made them available. Also he has been making several efforts to get hold of *Rhadinocentrus* but so far has got nothing worth while. Possibly he may send some direct to you now I have told him what I wanted them for. Probably he has also told you that he is going north in June as far as the Gulf of Carpentaria and understand that he is going to send you folk representative samples of the things he comes across. He will also be sending the same things direct to me so I will be able to keep you posted on identifications.

Have also been in touch with the Townsville Aquarium Club and they have promised to send down *rubrostriatus* and other things as soon as opportunity permits. Been a bit flooded out along the watercourses apparently and have not been able to do much hunting lately.

Second matter on my conscience is the odd facts and photos of my just completed fish room. Ian Derrick rang me up while in Sydney probably two months ago and asked if I would send this down to you for a 'Let's look in on' feature. Been some delay here since a few things were not complete and there were a lot of missing tanks in the section that offered a chance of photographing. Have only recently got these in place together with final wiring and other fittings. Then found out that my camera lens was

not suitable so enlisted the help of our professional boy at the lab. He has come good with quite a reasonable series from which I have selected two as giving the best idea of the layout. Also there are five pages of typing accompanying the photos. These are not intended for publication as such but merely to scratch through and for you to pick out some bits which you will want to rewrite in your own words. I think that there should be enough here to go on. If not let me know. Sorry I could not fit into one of the pictures but there is 6 ft and 16 stone of me and the fish house is rather small.

This is all that is on my mind for the moment so will close now.

Best regards,

Ian S. R. Munro

LET'S LOOK IN ON



IAN MUNRO

This month "finchat" travels interstate to visit the Sydney home of Mr. Ian Munro – eminent ichthyologist and authority on Australian native fishes. Mr. Munro, in looking in on himself, has provided an article which should prove interesting and amusing to all readers, beginners and old hands alike. We are looking forward to hearing more from Mr. Munro and other interstate contributors.

How the Fish Room Happened

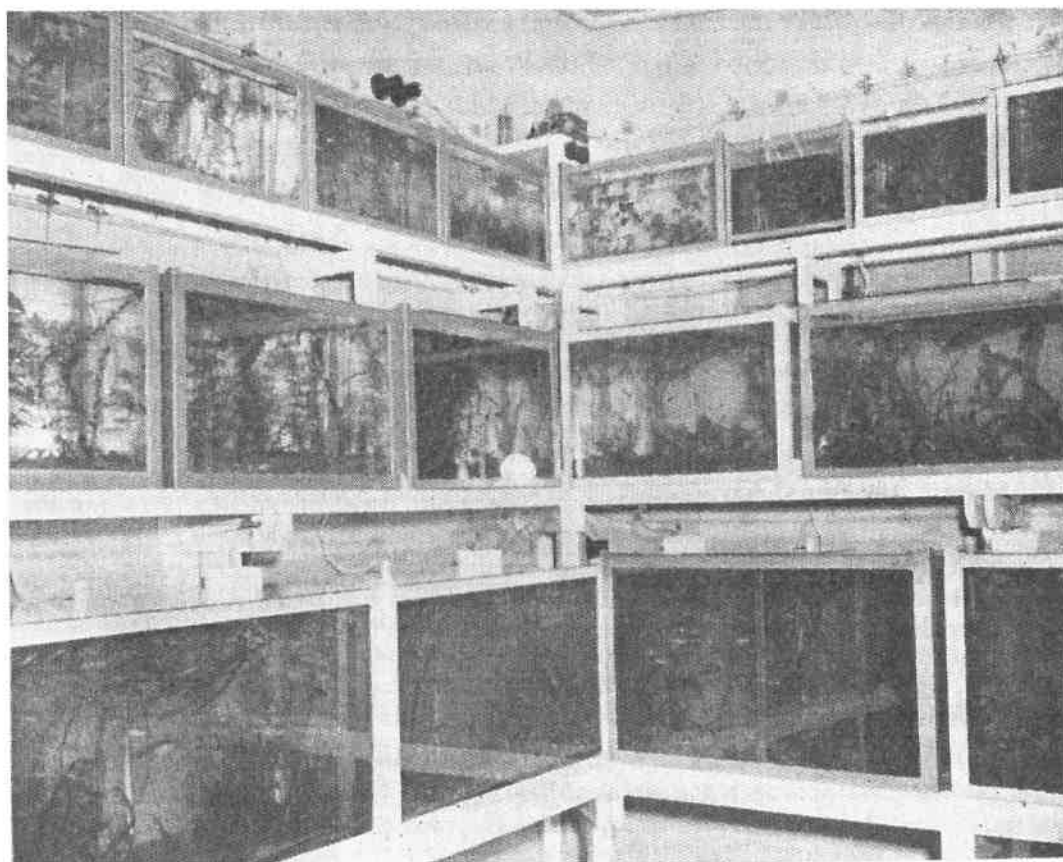
Could be just another story of how one small tank of goldfish in the living-room graduated first to tropicals and then grew into a fully-equipped laboratory-like fish room. This took only one short year to happen. Could be just another case of being badly bitten by the fish-keeping bug, but there is some case history. Back in boyhood days was that old discarded cement bath tub full of goldfish, and expeditions to the local creeks around Brisbane to catch *Melanotaeniids*. When the war broke out troops went into service and got bitten by mosquitoes, and then came a rather unusual commission – that of making surveys of native fishes with a view to natural control of mosquito breeding in some areas. After this marine and fresh water fishes became an obsession and the basis for a profession as a marine biologist and ichthyologist. There was a trip abroad, with official visits to many of the famous public aquariums of the world, and then the construction of an experimental salt water aquarium of about 120 tanks at the C.S.I.R.O. marine laboratory at Cronulla. Now there is pre-occupation with shelves of museum jars full of fishes in formalin and the task of writing handbooks on the fishes of Ceylon, of Australia and of New Guinea.

About 12 months ago something happened – maybe it was just the sickening sight of preserved specimens or maybe the almost daily telephone enquiries about fungus attacks, spawning goldfish or the like. Perhaps it was just the need to get close to live fish again. On and off there was the odd tank or two of native species or some swordtails that somebody had got tired of feeding. One of these old tanks was recovered from the loft, re-puttied and set up in the living-room with a small selection of tropicals. The damage was done. It is from here a very familiar story. The fish had babies and the plants grew lush. More tanks were needed, and more fish were acquired. They started to spread out of doors in too bright light and winter winds. The electric light bill was getting impossible. Besides this there was an official investigation of the *Melanotaeniid* and *Pseudomugilid* fishes in hand – a study of their distribution and speciation in so far as it gave a key to the understanding of the distribution of all fresh water fishes in the water sheds of Australia and New Guinea. The *Melanotaeniids* proved difficult to identify because of their great variation in growth and colour. Museum specimens were not providing the full answer to many of the problems of speciation, so the next step was that of rounding up friends, old and new, who could catch wild fish that could be kept and studied in tanks. Fish began to arrive, and more tanks were needed. No more need be said – a fish room was born.

The Building

Restricted space of a small suburban back yard ruled out any possibility of erection of a new building which might include the most desirable principles of design. Only alternative was conversion of a small existing outhouse, a brick fuel shed which had already been partly taken over to accommodate the nucleus of the battery of tanks. Now the demolition of brickwork, the laying of new bricks and the alteration of the concrete floor. This took quite a lot of week-ends, and was hampered throughout by having to do all this, including demolition and mixing cement, around a stack of tanks precariously perched on temporary racks of scrap timber and loose bricks. The place was virtually occupied before it was built. Only broke one cover glass during the operation, but the most serious mishap was on the hot day during which I must have consumed all the oxygen in the room and left it full of carbon dioxide. Then came the evening and the plants began to produce more carbon dioxide, so by the morning there was universal distress and lots of deaths. At this stage I had no air pump, and had to resort to a complete change of water in every tank, a process which took 12 hours continuous effort, to save the bulk of my stock.

Room dimensions are 9 ft. 6in. x 8ft. 3in. floor area, with a maximum height of 8ft., sloping down to 7ft. 6in. on the eastern wall. Not as big as one might wish for, but the worst trouble was the jig-saw puzzle of trying to fit in as many tanks as possible in a fixed space without wasting one inch of space. If there had been even a few more inches, then there could have been more 3ft. tanks.



IAN MUNRO'S FISH ROOM, WHERE MANY SPECIES ARE DISPLAYED.

The structure is on concrete footings with a substantial concrete floor which has a fall in all directions to a standard C.P. drainage grate. The walls are of single thickness brick cement, rendered inside and out. The outside is weatherproofed with Boncote cement paint, and walls are lined inside throughout with standard ½in. thickness canite sheets separated from the brickwork by a ½in. air gap. Sheets are joined flush with Gyprock paper strip and a waterproof adhesive. The skillion roof is that of the existing building, sheathed with corrugated fibro cement and lined inside with flat fibro sheeting. The 4in. air gap is completely filled with slag-wool flock as insulation. Natural top lighting is provided by cutting in two 5ft. standard fibro cement skylights, equally spaced to give even distribution of daylight. Skylights are double glazed with wired glass externally and white painted obscure glass internally. The internal glazing of each light is in three removable panels, so that one or more can have the water soluble paint removed during winter to control light and heat according to seasonal requirements. Along the eastern wall is full length highlight, and in the northern wall two hopper-type opening highlights for ventilation. All have outer glazing of obscure glass and two inner layers of taut P.V.C. film as insulation, the middle one being dark green to limit light from this source. Artificial lighting has not yet been installed, but will be in white fluorescent strips adjacent to skylights. The ceiling is white, to provide best reflected light from above, and walls medium green to blend with aquatic plants. Since the painting was done while the fish were in the room, a quick drying plastic finish was used. There was little in the way of fumes, and none of the fish suffered any ill effects.

Entry is via a covered patio with tropical pot plants and barbecue, this joining the fish room to the back of the house. A fully glazed door is provided, so that much of the fish room can be observed without entering it.

The Tanks

Tanks are arranged along three walls only, the fourth being left blank and partly taken up by the entrance door. A total of 32 tanks is arranged in tiers at three levels, and supported by neat framework skeleton of white enamelled oregon. The framework also serves to carry electrical wiring and air lines. The bottom tier starts 27 inches above the floor, and carries tanks all 18 inches in depth. The middle tier is of 15 inch depth tanks along two walls and 12 inch tanks along the third. The top layer carries all 10 inch deep tanks, used mostly for rearing small batches of fry, quarantine, etc., but are not too high for general observation. The tiers are staggered out from the wall to provide servicing space and the maximum of top lighting. Tank sizes are 36in. x 18in. x 18in. (one), 30in. x 18in. x 14in. (five), 24in. x 18in. x 12in. (one), 24in. x 15in. x 12in. (seven), 24in. x 12in. x 12in. (three), 18in. x 10in. x 8in. (twelve) and 12in. x 10in. x 8in. (three). All are provided with glass covers. No floor tanks have yet been installed, but thought has been given to this, and I am tossing up between glass-fronted aerated concrete troughs or shallow glass ponds with slagwool insulation packed under and behind them.

Heating and Aeration

At present I am operating on individual electric elements in all tanks. This seems to be the cheapest approach to electrical heating and with tank settings of 76 to 80 degrees keeps the room just pleasantly warm. Have experimented over a period with a borrowed 2400 watt heater-fan linked with a central thermostat near the ceiling, but

have abandoned the system as too expensive and as creating a heavy, hot-house atmosphere. All 24in. and larger tanks have proprietary brand Pyrex sheathed non-submersible elements of 100 watts, each operating off 240 volt mains. These are arranged in groups of 3 to 5 to an immersed thermostat, wired in parallel. Smaller tanks have similar type heaters of my own manufacture, providing 50 watts at 48 volts, and wired in series in groups of five to each thermostat. The system gives a possible range of temperatures. All heater holders have been modified to provide earthing to every tank.

The present air supply is not quite adequate, and consists of one "Prockter" heavy duty vibrator and one Model B "Hyflo" twin piston. The former works seven 15 in. and three 12 in. lifts to standard filter trays. The latter operates seven similar 18-in. lifts and supplies 15 air stones for the top tanks.

The Fishes

The majority of large tanks are at present occupied by community set-ups, arranged according to relative size and compatibility, but species are gradually being re-organised into quarters of their own. The most colourful is a mixed community of Neons, Ramirezi and red-wag and red-nosed blue platys, with a background of tall *Ambulia* and Cellophane plants, and a low foreground of brilliant green *Callitriche*. Heavily populated separate tanks of brilliant red (German) swordtails and guppies also make good show pieces.

Most prominently featured are Australian native fishes. One larger tank is devoted entirely to the North Australian and Papuan *Rhombosoma goldiei*, and another to brilliantly coloured *Melanotaenia carteri*. Another has a fair sized school of Northern Blue-eyes (*Pseudomugil signatus*). These are all wild fish flown down from their home in the Torres Straits islands. Other native Atherinids include *Melanotaenia rubrostriatus*, *M. maccullochi*, *M. fluviatilis*, *Rhadinocentrus ornatus* and the North Queensland Jewelfish (*Craterocephalus stercusmuscarum*). There are also two species of Chanda Perch from Queensland, *Ambassis macleayi* from the north and *A. agassizi* from the south.

Exotic species have not been neglected, as there is a fair range of livebearers, including mollies, guppies and various colours of Swordtails and Platys. So far the livebearers have been the busiest breeders., and are already creating an accommodation problem. Characins are represented by the commoner species, notably Head and Tail Lights, Pulcher, Lamp Eyes, Head Standers, Bloodfins, Penguins, Pencils and Tetras, including Glowlights, Neons, Red, Lemon, Black and Serpae. Amongst Cyprinids are Bitterling, White Clouds, Zebra and Giant Danios, Harlequin and Scissortail Rasboras and various Barbs, including Sumatra, Nigger, Cherry, Checker, Ticto, Golden and Cockscomb. There is the odd Black Shark, fat Coolie Loach, Sucking Catfish, Glass Cats, Corydoras and a few Siamese Fighters for colour. There are Blue, Lace, Kissing and Dwarf Gouramis, the latter with several broods and others busy thinking about spawning. Amongst the Cichlids are the various types of Angels, some getting quite large and another young pair busy hatching eggs, Etroplus, Ramirezi, timid Festivum and a large pair of Severum. Besides Bumble Bees are Javanese Carp Gudgeons and some local Compressus.

Most time and energy has been devoted to construction to date but there has been a steady programme of stocking with smaller examples of the various exotic

tropicals. In the meanwhile they have grown, so there is plenty of experience and amusement ahead now that many are beginning to think of mating and spawning. Current ambitions centre around a more comprehensive selection of our Australian native species and experiments with spawning and perhaps hybridization of some of these.

Aquatic Plants

Generally there is an abundance of healthy vigorous plants, which provide attractive backgrounds and shelter for the fishes. Several of the larger tanks have been more thickly planted and have lush jungles of the more familiar species, notably long trailing *Vallisneria*, *Cabomba* and *Elodea*, mixed with large Amazon Swords and *Cryptocorynes*, amongst all creeping dainty *Cardamine*. Here and there are thickets of *Val. torta* and bunches of *Hygrophila*. Amongst earliest acquisitions were the broad and fine leafed water sprites, but these have now been thinned out to some extent to make way for the speedier growers except in the guppy tanks. Some tanks have been planted out exclusively with one variety of plant, such as Water Wisteria, *Ambulia* or *Hygrophila*. Pigmy chain swords have spread out alarmingly fast along the sand at the front of tanks, but a recent addition from Queensland is the nucleus of a low-growing hedge of brilliant green *Callitriche*. Amongst other plants not often seen in Sydney are the more robust curled-leaf *Elodea crista*, and from Southern Queensland a very large leafed *Ambulia*. Also scattered throughout the tanks are the usual *Ludwigia*, North Queensland Lace, *Aponogeton ulvaceus* and *A. undulatum*, with, of course the soft plumes of *Ceratophyllum* and *Myriophyllum*.

Helping Hands

Oldest of three brats, Donald (aged 8) claims a share to part of the fish room. He has his own small selection of tropicals, personally selected and purchased with carefully saved weekly allowance held in hot little hand. His taste runs to the more bizarre Angels and colourful Neons, Serpae and Siamese Fighters. Sister Benny joins Mum with the fish widows, but Lindsay, not yet three, transplants *Salvinia* to the living-room carpet, and terminated experiments in outdoor wintering of livebearers by recently adding a packet of Lux flakes to the patio ponds. Now that it is too cold for the kids to use their small concrete swimming pool. Dad has been busy with some manure and a net – mosquito wrigglers and *Daphnia* now doing well.

C/- C.S.I.R.O.,
RESEARCH STATION
KATHERINE, N.T.

30th Aug. 1960

Dear Ron,

Many thanks for your letter of August 23rd. re our mutual friend Blackmast.

I have so far been on two expeditions, but was unsuccessful. It is felt that a more reliable method of catching is necessary because of the rate of flow of the river.

In the copy of 'finchat' Nov. 1959 it states: "was discovered by Mr. Eric Worrell in 1945 at the Katherine River Crossing". Also the same article quotes: "At night, hundreds of these fishes would scrape at his legs in the water and could be seen in the torchlight."

Your instruction list quotes: "try to spot shoals of small fishes from bridge".

Now all this is very difficult to understand for the following reasons:-

- 1) There are two Katherine River Crossings known as -
The Low Level Bridge Crossing,
Nott's or Nixon's Crossing.
- 2) The Low Level Bridge Crossing is a weir with a roadway above and a spillway beneath this. On one side is a swirling mass of water - approx. one million gallons per hour and the other side, whilst relatively calm, is approx. 8 ft. deep.
- 3) The Nott's or Nixon's Crossing has no bridge and the actual crossing is a rapid approx. six inches deep with another swirling torrent on one side and relatively calm water - but still flowing swiftly, on the other side.

The only other bridge on the Katherine River is the high level railway bridge, which is 70 ft. above water level.

There are many places along the river where one can walk around in say one to 4 ft of water and where this is reasonably still although still flowing, but these spots are nowhere near any of the crossings.

I think it necessary to mention that the Katherine River flows all the year round.

The questions that appear to be relevant are as under:-

- 1) Which Crossing did Worrell refer to?
- 2) How does the bridge come into it when it would be impossible to walk about in the water at that point?
- 3) As the Katherine River rises each year from 20 to 60ft. and as the rate of flow at this stage is extremely fast even from its source up in the Katherine Gorge, could these fish remain or could they again move upwards toward the source against a swift current and over many swift rapids.

NOTE: At the Low Level Bridge area it would be possible to walk around at a point approx. 400 yards away on the downstream side but even there the flow is fast.

During the dry season and when the river is at its normal level there are many small fish and many large ones including bream, catfish, cod, rifle fish and barramundi. It has been said by local anglers that the small fish cannot survive until the large ones have been fished out (which is easy here).

However, on my two attempts, I did catch a few small fish (not THE ones though), and I found that it was necessary to concentrate near the bank but because of the rate of flow and the speed of the fish one had to be very quick. I feel that a net approx. 4ft. square, no more than 14 inches deep and rigged on a frame would be more suitable if mounted on a tripod arrangement. What do you think?

Anyway, I hope you don't mind these comments as I feel it is necessary to illustrate the problem. In the meantime I will keep trying as this fascinates me.

Will certainly look forward to seeing you down there about the middle of November. In the meantime kind regards to you and yours and if you see Brian, to him also.

Yours sincerely,

(sgd. Bob)

R.J.Wren.

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

September 8, 1960

Dear Ron,

Have just received your letter and am interested to hear of the efforts to get hold of some *Quirichthys*. I have just consulted Gilbert Whitley's original account of this species but he gives even less information about the Katherine River locality than he gave in the 'finchat' article. Probably the only chance of getting more detail would be from Eric Worrell himself and I am not quite certain of how to get in touch with him. However I will make some investigations and write to him.

Probably we can take it for granted that the original specimens came from very shallow water and from what experience I have had with *Melanotaenia* and Blue-eyes in the field would suggest that fast flowing water would be out. However some of the more typical atherines are happy enough in a fair run of tide and like the Ambassids will congregate in schools head on to the flow of current. Personally I would begin looking in sheltered open sunny pools and back corners away from the run of current. Also if there are any neighbouring pools cut off from the main river and hold more or less permanent water, they would also be a good place to look. Of course it is virtually impossible to catch some of these fishes in deeper water without a small hauling seine and probably a boat of some sort to shoot the net from. Even with this gear one is up against the problem of keeping clear of snags in fresh water streams. I carry a small one in the back of the car but seldom can do anything with it because of snags. Swift flowing water also makes it difficult to handle, in fact almost impossible when one is on his own.

This sounds silly but a couple of friends have told me that they have captured Archer fish and *Melanotaeniids* in the far north by sitting down quietly on the bank in Isaac Walton fashion with a thread of cotton and a tiny hook or bent pin. With care the mouth does not get hurt and the method apparently produces the larger run of these small fish in deep and snaggy water. I tried once to catch some *Rhadinocentrus* on Fraser Island armed with only a small dipnet about 9 inches wide. The fish were far too swift for me and the water a trifle deep to get into and handle a net. We hit on the idea then of using the net as a butterfly net and swept about in the grass and collected a handful of insects. My offsider then stood on a little bridge over the creek and dropped the kicking insects on to the surface. As soon as an insect touched the surface a fish would rise to swallow it so it was just a matter of coordinating one's timing to scoop the fish from a calculated point and the surface. Both these methods just might happen to work once our friend locates his fish.

Unfortunately I cannot do anything through this organization about the supply of a net. We have got nothing suitable in stock and any gear we had is now worn out. Our net maker shot through about two years ago and replacements have not been made. Even if we had the gear it would not be politic for me at the moment to try to organize a loan for the particular purpose. Please do not misinterpret this since I am extremely sympathetic towards the general cause and am as keen as you are to lay my hands on some of these little fishes. The fact is that there is considerable political pressure being exerted on me to get my MSS of the Australian and New Guinea books out of the way as quickly as possible. Needless to say there must be no diversions and I am not being encouraged to take any interest in fresh water fauna more than is essential for the

background of these books. This of course does not stop me having a hobby but at the moment I have to draw a very firm line between what is work and what is hobby. You will appreciate my difficulty here since the paths meet and cross so often.

Possibly this situation will resolve itself in the near future since this division may have to accept some responsibility in the field of Aquariology in Australia, at least to advising on technical aspects of construction of public aquaria and to put extension work to the hobbyists on a sounder basis. Oddly enough there have been several things this week. The Commonwealth and State fisheries departments get together within a week or so and amongst the items on their agenda is one of paramount interest to aquarists, namely the question of uniformity of procedure in importation or prohibition of exotic tropicals from overseas. I have already been brought in on this and possibly there will be further developments.

Another item was an invitation to me from Jean Garnaud and Capt. Costeau to attend the International Congress on Aquariology at Monaco in November this year to celebrate the Museum and Aquarium's jubilee. Should be an interesting meeting since they are expecting about 150 personalities from about 50 nations and discussions, although centred around public aquaria, will deal with all the aspects of latest developments of technique and equipment. The sad part however is that I will almost certainly have to decline since CSIRO have not allowed in the budget for fares or expenses. This is a great pity because there is a fair chance that this division may be erecting a new aquarium block in the foreseeable future and it seems that we could well make use of this sort of experience. However unless Santa Claus and a few fairy godmothers materialize from space I think I will still be sitting in this same chair grinding out descriptions of fishes like turning the handle of a sausage machine next November.

On another front I have been worrying about what has happened to Frank Lewis. I have not heard a sound from him since June and am beginning to wonder if I have personally upset him or whether he has given me away on account of lack of interest by this division in his gulf trip. You probably know that he invited me to go with him but I was not free to do so. Jeff Knight managed to come out here on the only free evening and promised to investigate when he got to Brisbane. Have you got any knowledge of what went wrong?

Anyway I am supposed to be talking about nets so must get back to that subject. When it comes to scoop nets I have always favoured one with a triangular frame. Theoretically the larger the better but there is a practical limit to size based on ease of handling and the mechanical structure of the frame. Probably 12-15 inch per side is about the limit. Frame needs to be roughly $1\frac{1}{2}$ " x $1\frac{1}{3}$ " flat brass welded at the peak with sturdy straps bolted to the handle. Net is probably best of strong mosquito net with a reinforced calico band attaching it to the frame. A sturdy broom stick or rake handle about 5 feet long is best to give reach and leverage. The triangular shape is better than square or circular as it permits better movement through weeds when used for sweeping and cuts the water better for a quick dip and snatch. The length of the bag should not be greater than to give adequate overlap across the frame when closed, otherwise it gives too much water resistance. Also the tip should be moderately rounded rather than pointed.

A useful tool also is the cast net, i.e. useful for those that are skilled in using one. If they are too big and wrongly thrown the user is likely to end up with the crocodiles. There is a ban on the use of these in some states. You are probably familiar with this type of gear and I think there is a picture of one in the back of Innes' book on aquarium fishes

I have already mentioned hauling nets and have often used a miniature version. Minimum useful size is about 30 yards and 4-6 feet depth in hanging. The centre section can be of mosquito net but is better if made of light weight fishing net of mesh about $\frac{1}{4}$ " to $\frac{1}{2}$ ". This of course is highly illegal and even with a permit in the collector's hand he finds it hard to get hold of a small enough mesh. The central bunt is best if it has a small bag in its middle but with a lot of flue in the middle the net is equally satisfactory. There would need to be about 6 yards in the small mesh central section but the rest can be made up of wings of much larger mesh. The larger mesh will hound in the fish during the earlier stages of hauling until they are completely imprisoned by the small mesh of the bunt. Head and foot ropes can be made of sash cord or some other light cording of about $\frac{1}{4}$ " diameter and only the smallest corks and leads to hang such a net so that it will be properly balanced and fish properly without rolling or spilling the catch.

There are two modifications of this type of seine which cut out the need for a boat and can be operated by one instead of two men. The first is a scissors-net as used by prawn fishermen. In its smallest and simplest form consists of two broom sticks tied about $\frac{1}{3}$ rd of height from top and with a lead line tied loosely across the bottom. A mesh bag with a reasonable amount of free flue is attached to the poles and leadline. It is operated by walking along holding the free ends in the hands and pushing it ahead of you with the lead line riding over the bottom. Needs strong arms and shoulders.

Another variation is just merely two broomsticks with a short length of seine net attached to lead and cork lines. These are usually 6-10 feet long and about 3 feet deep but need two men to operate them efficiently. A small model can be operated by one man in a rather clumsy fashion. One could just about get away with mosquito net here but it is never as good as $\frac{1}{2}$ " mesh which is usually adequate to retain all but the smallest things. I rather fancy that this is the type of net used mostly by collectors of tropical fishes in streams overseas.

This just about exhausts my thoughts on the subject. In case you don't think that all these suggestions are mad and assuming that you are not familiar with them all I will include some rough sketches. The details are mostly a question of personal preference.

The fishes from Townsville sound interesting but I take it that all are salt or brackish water species. It would be hard to even venture a guess on the identities without seeing the specimens. The Rhino-horn Goby is rather a surprise and you will be interested to know that it never has been recorded officially from Australia. The nearest I know of is the island of Waigeu off Dutch New Guinea. Its correct name is *Acentrogobius balteatus* (see "finchat" cover bottom of next page).

There is no further news here especially in view of having received no fish from Queensland. I have had word from Vienna about the type of *Ambassis agassizi* and am fairly certain that the south Queensland species is not the same. Have also received further details about the type of *Melanotaenia nigrans* and am now quite confident that it is the same as *Rhombosoma goldiei*. Please let me know if you have received any specimens from Frank Lewis and if this is amongst them. If not I will send you down two or three pairs from my tanks. Mine are healthy but not growing much mostly because they are probably too crowded. I have not lost the three big Blue-eyes and my own lot from Torres Strait have gradually dwindled in numbers. However I was pleased to discover last night that I had spawned a few of this lot. Only got a few fry and had not noticed any eggs. Must get on to these again and isolate the eggs and see what sort of a hatching eventuates. The orange finned are conditioned so I must separate them and see if I can get eggs and fry from this species also.

Must close now so best regards to all,

Yours sincerely,

Ian S.R. Munro

T E L E G R A M

12 SEP. 1960

Katherine NT

Mr R. L. Bowman

49 Chadstone Rd.

S.E.10 Vic.

Will be consigning approx 3 dozen live specimens as per special arrangement TAA Thursday flight 589/513 from Katherine Arriving Melbourne 7.25pm. Am holding in special condition In my laboratory here.

Regards / Wren



Cover of the December 1960 Issue of FINCHAT announcing the first report of the discovery of the Rhino-horn Goby in Australia (photo by Ron Bowman)

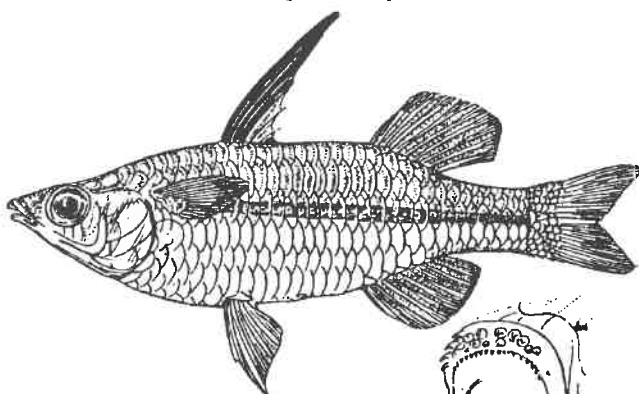
A September shipment of fish, collected near Townsville and despatched to T.A.G. by the Townsville Aquarium Club, contained among other interesting species, some Rhino-horn Gobies. We reported this to Ian Munro, an authority on Australian fish species, and we quote his reply:- "The Rhino-horn Goby is rather a surprise, and you will be interested to know that it never has been recorded officially from Australia. The nearest I know of is the island of Waigeu, off Dutch New Guinea. Its correct name is *Acentrogobius balteatus*."

ARMCHAIR SAFARI

by Ron Bowman

Being the story of the collection and delivery of the first live specimens of the Australian Blackmast, *Quirichthys stramineus*

Inset lower right
mouth showing the teeth
outside the lips.



Drawn by G. P. Whitley

A description of an Australian fish, the Blackmast, was given in the series "Fresh Water Fishes of Australia" by Gilbert P. Whitley, and published in "finchat" of November, 1959.

The editor of "finchat", Ron Bowman, was intrigued by the description of the fish, which we reprint here to put you in the picture:

"This beautiful little fish, which may yet achieve world recognition as an aquarium pet, was discovered by Mr. Eric Worrell in 1945 at the Katherine River Crossing, Northern Territory. At night hundreds of these fishes would scrape at his legs in the water, and could be seen in the torchlight. He travelled many miles along the river by dugout canoe and other craft without encountering the species elsewhere. When he brought specimens to the Australian Museum, Sydney, and to Melbourne Ward's Gallery in the Blue Mountains, I tried to classify them and found that they belonged to an unnamed genus and species related to Celebes fishes called *Telmatherina* and *Paratherina*. His specimens were straw-yellowish in colour and I named them *Quiris stramineus* because of the "*Quirites straminei*," or figures of straw (effigies of Roman citizens) which used to be thrown into the Tiber in bygone days. I did not know then that someone else had used the name *Quiris* for an insect, so the fish had to be re-christened *Quirichthys* because no two kinds of animals are allowed to have identical names. I called these fishes Strawmen, but Mr. Worrell was more impressed with their black dorsal fins and called them Blackmasts, a name I gladly adopt. They obviously came "in between" Blue-eyes and Sunfishes, and had remarkable teeth over the lips outside the series of teeth in the jaws." (See illustration, bottom right inset.)

Well, Ron read this description many times, and no matter how many times he read it, Katherine seemed just as far away – certainly there was no hope for Ron himself to get there, as he was too busy in his job as a commercial artist. And how far away was Katherine? Two thousand miles!

One day, so we're told, Ron was reading the Blackmast epic when he should have been drawing, when inspiration struck. He dashed to the phone and rang John Meeking, who heads the Publicity Department of Trans-Australia Airlines.

"John, does T.A.A. call at Katherine? It does? Well listen to this!"

Ron told of his idea – John should send a copy of November "finchat" to his Katherine agent, asking him to get one of the locals to try to locate the fish, and this done, Ron could organise him to catch some, send them down, and if all went well, the Blackmast would be seen alive for the first time in the big cities.

Was John interested? Could he use the story if it came off? He certainly was, and he certainly could.

The weeks turned into months, and poor Ron began to despair. He rang John, and heard the discouraging news that the Katherine locals weren't exactly galloping around after these fish – in fact, no one seemed to care – after all, at 2½ inches, who'd want them anyway – that guy in Melbourne, he must be crazy.

Just when Ron was losing hope on his brain-child, one of his co-workers in the advertising agency, Brian Fogarty, happened to mention that he was going through the Northern Territory on a buffalo and crocodile shooting holiday with a couple of his pals.

"You're passing through Katherine on your way to Darwin?"

Brian nodded.

"You beaut. I may get you to do something for me if you can afford the time!"

Ron then outlined the details of his search to Brian, and arranged to make some nets available when the party was due to leave.

Quite a deal of planning and work went into the next few weeks, as Ron realized this could be his now or never chance of getting the Blackmast.

With no practical fish collecting experience (outside an aquarium), Ron had to explain to Brian, who had no fish collecting experience, how to catch a fish he had never seen, in a river about which he knew exactly nothing, apart from the brief notes in the Blackmast article.

When departure day came, Ron had organised

- One daphnia net plus 5 foot handle (borrowed from Cec Davis);
- Three cardboard cartons (donated by Fred Parkes), which he had addressed and marked very clearly to Ron B.;
- Six large plastic bags (begged from Mal Horwood), arranged so that there were three sets of two bags for double security;
- One 6ft. x 6ft. sheet of heavy "Visqueen" P.V.C., which had been fitted with draw strings to pull the sides in, forming a portable 4ft. x 4ft. pond;
- One November "finchat" containing an illustration and description of the Blackmast; and
- One "How to go about catching the Blackmast" (entirely fictitious, based on observations of the behaviour of fishes in aquaria) and "How to pack and consign fish when and if caught."

So Brian set off with his two mates in the Station Wagon, and Ron settled in for the long suspense – they expected to make Katherine in about a week.

Some three weeks later, when Brian returned after he flew back from Darwin when his leave pass from work expired, Ron learned of the attempts to locate the Blackmast at Katherine, and also received his first description of the area.

Brian found that the main road at Katherine River actually crossed a weir, and above this the water was very deep, and the banks very steep. Below the weir there was swift-flowing water through rocks.

Brian was unable to locate the fish, but fortunately he made contact, as per plan, with a Katherine resident, Mr. Bob Wren. (Brian met him in the pub ... of course).

Here we had our really great piece of luck, for Bob Wren is at the Commonwealth Scientific and Industrial Research Organisation (C.S.I.R.O.) Research Station at Katherine, which has a laboratory, and his hobby is cave exploration and collecting specimens of native fauna found in his travels. He has a private museum in which to display his collection.

Here then was someone well qualified and interested in our quest.

Brian left the nets and gear with Bob, in the hope that he would be able to locate the fish.

The next phase of the story is best told by a letter which Ron received from Bob Wren some two or three weeks later:

30th August, 1960.

Dear Ron,

Many thanks for your letter of 23rd August re our mutual friend Blackmast. I have so far been on two expeditions, but was unsuccessful. It is felt that a more reliable method of catching is necessary, because of the rate of flow of the river. In the copy of "finchat," November, 1959, it states "was discovered by Mr. Eric Worrell in 1945 at the Katherine River Crossing." Also the same article quotes: "At night hundreds of these fishes would scrape at his legs in the water, and could be seen in the torchlight." Your instruction list quotes: "Try to spot shoals of small fishes from bridge."

Now all this is very difficult to understand for the following reasons:

(1) There are two Katherine River Crossings, known as

(a) The Low Level Bridge Crossing,

(b) Nott's or Nixon's Crossing.

(2) The Low Level Bridge Crossing is in fact a weir with a roadway above and a spillway beneath this. On one side is a swirling mass of water (approximately one million gallons per hour), and the other side, whilst relatively calm, is approximately 8 feet deep.

(3) The Nott's or Nixon's Crossing has no bridge, and the actual crossing is approximately six inches deep, with another swirling torrent on one side and relatively calm water, but still flowing swiftly, on the other side.

The only other bridge on the Katherine River is the high level railway bridge, which is 70 feet above water level. There are many places along the river where one can

walk around in say one to four feet of water, and where this water is reasonably still, although still flowing, but these spots are nowhere near any of the crossings. I think it necessary to mention that the Katherine River flows all the year round.

The questions that appear to be relevant are as under:

(1) Which Crossing did Worrell refer to?

(2) How does the bridge come into it (Low Level) when it would be impossible to walk about in the water at that point?

(3) As the Katherine River rises each year from 20 to 60 feet, and as the rate of flow at this stage is extremely fast, even from its actual source up in the Katherine Gorge, could these fish remain or could they again move upwards towards the source against a swift current and over many rapids.

NOTE: At the Low Level Bridge area it would be possible to walk around at a point approximately 400 yards away on the downstream side, but even here the flow is fast.

During the dry season, and when the river is at its normal level, there are many small fish and many large ones, including bream, catfish, cod, rifle fish, barramundi. It has been said by local anglers that the small fish cannot survive until the large ones have been fished out (which is easy here).

However, on my two attempts I did catch a few small fish (not THE ones though), and I found that it was necessary to concentrate near the bank, but because of the rate of flow and the speed of the fish one had to be very quick. I feel that a net approximately 4 feet square, no more than 14 inches deep, and rigged on a frame, would be more suitable if mounted on a tripod arrangement. What do you think?

Anyway, I hope you don't mind these comments, as I feel it necessary to illustrate the problem. In the meantime I will keep trying as this fascinates me. Will certainly look forward to seeing you down there about the middle of November. In the meantime, kind regards to you and yours, and if you see Brian, to him also.

Yours sincerely,

R. J. WREN.

On reading this letter, Ron had it copied and sent this to Ian Munro, our ichthyologist friend in the C.S.I.R.O. Marine Laboratory in Sydney, seeking advice and answers to Bob Wren's problems.

A prompt answer from Ian was received, and we publish the first page of this letter for your interest:

8th September, 1960.

Dear Ron,

Have just received your letter, and am interested to hear of the efforts to get hold of some *Quirichthys*. I have just consulted Gilbert Whitley's original account of this species, but he gives even less information about the Katherine River locality than he gave in the "finchat" article. Probably the only chance of getting more detail would be from Eric Worrell himself, and I am not quite certain of how to get in touch with him. However, I will make some investigations and write to him.

Probably we can take it for granted that the original specimens came from very shallow water, and from what experience I have had with *Melanotaeniids* and *Blue-eyes* in the field would suggest that fast flowing water would be out. However, some of the



THE BLACKMAST,
***Quirichthys stramineus*,**
Here he has his tall, black
dorsal fin fully erect.

– Photo by Neil Armstrong

more typical atherines are happy enough in a fair run of tide and, like the Ambassadors, will congregate in schools head on to the flow of current. Personally, I would begin looking in sheltered, open, sunny pools and back corners away from the run of the current. Also, if there are any neighbouring pools cut off from the main river, and holding more or less permanent water, they would also be a good place to look. Of course, it is virtually impossible to catch some of these fishes in deeper water without a small hauling seine, and probably a boat of some sort to shoot the net from. Even with this gear one is up against the problem of keeping clear of snags in fresh water streams. I carry a small one in the back of the car, but seldom can do anything with it because of snags. Swift flowing water also makes it difficult to handle, in fact, almost impossible when one is on his own.

This sounds silly, but a couple of friends have told me that they have captured Archer fish and Melanotaeniids in the far north by sitting down quietly on the bank in Isaac Walton fashion with a thread of cotton and a tiny hook or bent pin. With care the mouth does not get hurt, and the method apparently produces the larger run of these small fish in deep and snaggy water. I tried once to catch some *Rhadinocentrus* on Fraser Island, armed with only a small dip net of about 9-inch side. The fish were far too swift for me, and the water a trifle deep to get into, and handle a net. We hit on the idea then of using the net as a butterfly net and swept about in the grass and collected a handful of insects. My offsider then stood on a little bridge over the creek and dropped the kicking insects on to the surface. As soon as an insect touched the surface a fish would rise to swallow it, so it was just a matter of co-ordinating ones timing to scoop the fish from a calculated point at the surface. Both these methods just might happen to work once our friend locates his fish.

Ian then went on to describe and illustrate many different nets and methods used for collecting fishes, but before Ron could do anything about organizing any such equipment, he received the following telegram:

Katherine, Northern Territory. 12th September, 1960.

Mr. R. L. Bowman, 49 Chadstone Road, S.E.10, Victoria.

Will be consigning approximately 3 dozen live specimens as per special arrangement T.A.A. Thursday, flight 589/513 from Katherine, arriving Melbourne 7.25 p.m. Am holding in special condition in my laboratory here

Regards, WREN.

During the next four days Ron found it very difficult to concentrate on his work, and eventually at about 8 p.m. on the Thursday Ron left Melbourne Airport with his three cartons of fish.

He took great care in transferring the fish to their tanks, the transfer being completed in the small hours of Friday morning. Meanwhile, the Australian Broadcasting Commission had been on the phone seeking details of the arrival of the new fish, which were featured in the Friday morning news broadcasts.

When Ron staggered out of bed on Friday morning, he rushed into the fish-house to discover that there were no casualties – in fact, there was not a fin frayed.

It was then noticed that, apart from the Blackmasts, there were also several 1-inch fry of a *Melanotaenia* species. That morning was pretty hectic, for Ron had to assist in a TV film for showing on the evening newsreel, and he received a letter from Bob Wren which filled in the missing parts of the story on how the fish were collected.

We leave it to Bob's letter to explain

14th September, 1960.

Dear Ron, By the time you receive this letter you will have received approximately three to four dozen fish. I sincerely hope they reached you alive, and further I hope, they are, the species that you required.

They were caught on Sunday, 11th, Monday, 12th and Tuesday, 13th, in the Katherine River, approximately 100 yards below the Low Level Bridge, in a pool approximately 10 feet x 15 feet x 2 feet 6 inches, through which the current was flowing at the rate of approximately two to three knots. In the same pool were four other species of fish of a larger variety. The pool also contained several fresh water crays (yabbies) approximately four to 10 inches. The atmospheric temperatures were 91.1, 93.4 and 100.2 respectively for the days mentioned (maxima). Water temperature was constant at 82 degrees F.

They were caught in the manner indicated in your instructions, but they do not appear to be as friendly as stated. In fact, they are very timid, and after approximately a half hour a lull of another half hour appeared to be the best method. They soon became very aware of the net. The larger ones were difficult to catch, and the death rate is higher amongst them. Approximately 12 large ones were caught, but they died within an hour. One which survived the river phase, died the following day in the pool.

The fish were kept in the "Visqueen" pool, which I erected in my lab. The temperature was kept constant at 75 degrees F. Water was exchanged each 12 hours at the rate of approximately one gallon.

Packing was in accord with your instructions, except that the amount of oxygen was not quite clear. However, the bags were filled as instructed.

Authority for the export of the fish was obtained from the Director of Animal Industry in Darwin (all wild life is governed by various export controls and in fact licences are required for most things). The specimens that died have been preserved in alcohol, and are in my private museum.

After some questions, Bob continues:

I am going away during next week, and will be working in areas in the vicinity of the source of the Katherine River – Katherine Gorge. I will see what is up there also. It is doubtful as to whether I will be able to catch any more for you until I return from my leave. I will be leaving here on 29th September, and expect to be in Melbourne about the third week in November. I trust it will be in order for me to bring the net, etc. down with me unless you would care to leave them here for later work. However, I do hope they are O.K., and at this time of writing they are swimming around the pool looking very fit and happy. I only hope it all goes well tomorrow.

With kind regards.

Yours sincerely,

R. J. WREN.

When Ron arrived home from work that evening, he was shocked to find that many of the Blackmasts were dead, and most of the others were staggering around the tanks with mouths and gills working overtime ... the *Melanotaenia* fry were all fit, but of all the Blackmasts, only three survived ... the two largest and one small one.

Ron cannot be completely positive until Katherine River water samples are received for testing, but he thinks that the fish died from shock, and that they cannot tolerate the presence of any salt in the water. (Most Australian fishes travel better in slightly salted water, but these could be the exceptions).

After his initial disappointment, Ron was happy to have his three Blackmasts in his aquarium, where he could study their behaviour with other fishes. We'll let Ron conclude this story in his own words:

"The Blackmast, *Quirichthys stramineus*, is an interesting fish. He is lively and peaceful, and quite distinctive. The tall, black dorsal fin is folded back whenever he is worried (this makes photographing very difficult), but is usually held erect as he chases around the tank. There is a black stripe along the body, and a blue-green iridescent stripe immediately above this. The clear second dorsal and anal fins are edged in yellow. Other fins are clear, except for the first dorsal fin, which has a feather shaped "black mast," with the rest of the fin clear. The body is quite transparent, apart from the silvery sac around the organs.

The three surviving fish are, I think, two large males and, possibly, one young 1-inch female.

Now that I have had a chance to study the fish, I am sure that it will become well known to aquarists in the next few years, and I hope to get a further consignment of fish from the Katherine area when Bob Wren returns from his leave.

Thanks are due for the success of this project to John Meeking of Trans-Australia Airlines, to T.A.A. Freight Services for their efficient handling of the consignment, to Brian Fogarty who diligently arranged my contact to Bob Wren – and, of course, to Bob himself for the work he has already done.

It still seems rather unbelievable that, by our persistence and a large slice of luck, we have managed to obtain these fish by just using the office phone and the writing pad to get such a successful result with our 'armchair safari'".

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

August 15th 1961

Dear Ron,

You are dead right I do owe you a letter from September last year. I thought I had answered that one but with your article in 'finchat' about *Quirichthys* and later on a visit from Bob Wren in person I feel that I have lived all the story myself and imagined that I must have answered you. Last night I eventually found your letter amongst a lot of bills that I was attempting to settle. Your reminder of August 9 came at a good time, namely I had reached a point where I had decided to answer all neglected official correspondence which had been sadly neglected since the end of last year. All correspondence has been neglected owing to pressure of many commitments, mostly deadlines set for the finishing of my MS on the fishes of Papua and New Guinea. None of the deadlines have been achieved and I am 8 months past a promise for the finish of volume I, a massive MS of over 700 typed pages which I think are not going to see the light of day anyway. Government departments are not happy about finding about £8,000 to print 2 volumes of this size and it looks that I have to get to work with a pair of scissors and remove two thirds of this text during this coming month or so and then turn around and prepare a similar Volume II covering about 500 more species by the middle of February. Apparently after this I stop identifying fish for a crust but go on to the job of identifying larval fishes and eggs that float around in the wide blue oceans - this is what I started out to do about 15 years ago. It should be interesting because it means setting up a saltwater aquarium again and really searching for the proverbial needle in the haystack. At least it means that I get out of my armchair and begin riding the waves of the ocean swell in little boats with a plankton net trailing along behind.

The pressure of trying to write the New Guinea book against time bent me a bit towards the end of last year and like those little fishes that have to travel long distances in plastic bags I ended up being doped with Sodium amytal. I decided that there was no percentage in being treated like a fish so I decided to let everybody else do the worrying. The result is that the handbook never met the deadline, cabinet ministers are tearing their hair, and none of my correspondence got any attention. It would be much easier of course if people asked simple questions in their letters but somehow or other they always send me hard ones. You will probably have heard and realize that one of the tough ones popped on me during the last 12 months is the convenership and secretariats of the Advisory Committee on Importation of Live Fish. Little did I imagine when I stuck my nose into the aquarium hobby that I would be landed with this nasty little task; I was hoping that long before now there would have been an official press release on the work of this Committee and that I could have passed on something reassuring to publish in 'finchat'. This of course has much bearing on future activities of aquarists in Australia and you may have heard a little through Dick Slacksmith.

Since I heard from you last I have been to Brisbane twice, in October last year in connection with my father's sudden death and again in December to spend Xmas. On both occasions I had my first contact with Frank Lewis and brought back quite a few indigenous fishes. I talked to Frank about the tragedy of your *Quirichthys* and his opinion was that the trouble lay in pH shock. I would not know about this since it is something that has never affected new additions to my own tanks. Actually I seem

to be having a lot of pH trouble right now but it is my impression that undesirable pH takes time to manifest itself. Over the last year or so I have bred large quantities of livebearers but during the past few months have been practically cleaned out. I have never worried about pH and until recently never bothered too much, doing occasional tests with the universal indicator papers of suitable range. Lately I have suspected that my water was getting rather acid very quickly so I borrowed a nifty little Lovebond comparator. Using Promocresol purple as indicator I find that much of my water is at or below the lower limit of 5.4 and suspect that other indicators might show that it is even more acid.

Other people that I have spoken to seem to think that their tanks are acid too but only use Bromthymol blue which has a rather limited range, so possibly their tanks are more acid than they think. My guppies died off first and I thought this was due to too much inbreeding because this had happened before and everything went well again after I mixed different stocks. Late last year I became impressed with subsand filters and fitted them to all my tanks. Most of the boys here say this is the cause of increased acidity but I think it might be tied up with CO₂ production and limited photosynthesis resulting from the poor natural light conditions which we have had in Sydney this winter. Towards the end of summer I had so many plants that they were being tossed on the compost heap and now the growth has deteriorated considerably. I have yet to decide which is the cause and which is the effect. In the last few weeks I have completed an installation of lights over all the tanks and imagine that the plants are beginning to pick up again. At least all the tanks have sparkling clear water and look very attractive under the fluorescent lights but I am not sure that the expense and effect are worth it if acid conditions are going to kill off all my stock. Live food is very difficult during the winter in this neck of the woods and I will be happy to see and hear a few mosquitoes around again. To keep to the subject I have never bothered to test pH before introducing new fish and I am sure that there must have been some noticeable differences but I have not seen any react like your Quirichthys. The business of quick breathing is nothing new to me and I am inclined to think that high acidity in water of low calcium content may be the prime cause. High CO₂ content does not necessarily mean any drop in O₂ saturation but apparently it has bearing on osmosis in the gill membranes and upsets the respiratory rate. Do not quote me on this because I am not a physiologist. I would be surprised if the Quirichthys were susceptible to a low saline content. I guess that they are derived from the typical salt water Hardyheads, some of which along with the Blue-eyes have colonized fresh waters and should have some sort of hereditary tolerance. The related Melanotaenids are nearly always restricted to fresh water but my *nigrans* in Prince of Wales Island did occur in small numbers in water that was too brackish to drink. I have often changed many of my Melanotaeniids from tanks containing about 1/20th seawater into newly set up pure soft water run from the tap, the only precaution taken to bring the temperature within a degree or so. It may horrify you to know that in winter I boil up a jug or two and toss it in to get the temperature right. I have never seen a fish get a shock or die as a result. Usually they are delighted to have the invigoration of some nice new water. All the Melanotaenids and Craterocephalus that I have kept here seem extraordinarily tough and tolerant of a wide range of conditions. The only major loss was recently when I stirred up a tank of old water which had probably reached a critical level of high acidity to remove some rosy barbs which were looking rather scabby and breathing hard. There were about a dozen fine old *Melanotaenia fluviatilis* in the same tank and they looked OK so were left. In the morning I had no more stock of this species. I still haven't. I gather from Bob Wren's notes that he changed over the natural water before dispatching the fish south. Would it be that he used rain water (soft) whereas the natural water of the Katherine may be hard and alkaline? I am not clear about the logic of changing over the natural water anyway.

You have not said (I think) whether the 3 surviving Quirichthys are still with you or if not how long they survived under Melbourne conditions. Bob Wren gave me a number of preserved samples presumably the larger ones which died during his attempt at capture. He did not include amongst these any of the Melanotaeniids.

I gather from reading Finchat and your letter of the 9th that these have survived, grown and been successfully bred. I take it that the couple of pairs of red-tailed rainbows are of this original catch from the Katherine River. Certainly I would like to see them because outside of New Guinea the only ones which have red in the tails seem to be *maccullochi* and *fluviatilis*. The supposed hybrid that "Big Peter" Tsang bred while with Harry Martyn and Frank Lewis and which I had a male of for about two years had a bright red tail. He eventually got beaten up by some bullies and died from the fungus or the malachite green I tried to cure him with. The small size and red tail of your species rather recalls *maccullochi* but this does not sound right for that locality. A few months back I got a batch down from Papua including two species. One apparently is the true *goldiei* which has orange on the flanks and tail. And the other I imagined was, from its dark longitudinal stripes, *maccullochi* when I first opened the bags for the quarantine officer. When I got them home and put them next to *maccullochi* I changed my mind. They have black lines much the same except that one of the lower ones is wine red. The flanks and fins colour up a bright lemon yellow. Apparently this is identical with preserved ones I had had from Papua and mistaken for *maccullochi*. I am describing them as a new species. I do not want to distribute any of these until I get a description published and the name given status.

The *goldei* were a surprise too because I imagined that it was identified with my *nigrans* but I was quite wrong — the colours in no way resemble one another and there is an apparent statistical difference in fin counts. I have also suddenly noticed that those 3 so-called *carteri* which you bred and sent to me earlier on are not the same as the thing from Torres Straits that I call *rubrostratus*. The Rubros have dark carmine lines on the body and similar coloured marks on the fins and have no spot on the operculum. I am still uncertain whether or not yours are *carteri* or not. If I eventually got the facts sorted, the parents of yours came from Rockhampton, ex Frank Lewis, and may represent a separate eastern stock of which the earliest name would be *splendida*. Last week I managed to get a few fish collected from about 100 miles from Darwin. Something went wrong probably in the handling and packing, since most arrived dead and the rest badly bitten. All but two are now deceased. There were 200 and 10 of what appears to be true *carteri* which I think is the same as *maculata* they were not very different from your brood but much more vivid and predominantly yellowish. I thought I was going to get one male out of these but he suddenly fungused around the head and suffocated from inflammation of injuries around the head and gills. Amongst others that survived the trip is a small *nigrans* same as the Torres Straits ones which confirms that the species ranges west through the type locally Port Essington and makes me happier that I have got the right name on the right fish. Also were 4 Mouth Almighty (*Glossamia aprion*) and I know why this Apogonid mouthbreeder got this odd name. The big one ate all the smaller ones, with a great mouth gape which extends far behind the eye.

As you will have gathered I did not find any fairy godparents and did not go to Monaco for the Congress in Aquariology. There is a little souvenir postcard and a short letter in shocking handwriting in the French tongue from Jean Garraud. I had no education in French and most of my colleagues probably should have had more than they did. I gather that between regrets and salutations that everyone had a happy get-together and most of the proceedings of the meeting will be published in the bulletin Oceanographique of the Institute at Monaco. When he did not say. Also he adds, if we have read his French and his writing correctly, that he is personally engaged now

(or soon, if and when he has time) in preparing plans of layout of the perfect public aquarium set-up. If the project for a public aquarium in Melbourne is to go ahead and you folk are involved, you will need to get in touch with this little gentleman with the goatee beard. Had a visit today from your Director of Fish & Game, my colleague Alf Dunbavin Butcher. I asked him about the progress but he seemed rather pessimistic owing to the large expenditure involved in building an installation of a worthwhile size. No doubt there will be progress and we will hear more as time passes on.

August 29th. I must have got tired before I finished a fortnight ago but with Finchat arriving this afternoon I realised that I had not completed or posted this letter. However I suddenly got enthusiastic about some additions to accommodation here and got busy on my drawing board and completed a set of plans which are now with the council. We have 3 kids (2, 1) sharing a single bedroom and with another due in about 2 months the situation finally filtered through. Flat building in this town seems to have come to a sticky end between protests from residents and credit squeezes, new valuations have come in from the V.G. and rates are not going to be too terrible. Anyway nobody wants to buy this house so we have decided to stay and enjoy the convenience. The architect which we had did not come up with good suggestions for extensions despite the size of his bill and I have ended up doing my own thinking and did a new set of plans and specs myself. Any day now I will be on a shovel behind the concrete mixer and laying bricks so I see a certain amount of neglect for the fish house during the next six months or more.

I have been tooling up for some time now and have a fairly well equipped fish house even if I will not be in the position to get the most out of it for a while. So far I have seen no reason to convert to any new form of heating other than the individual electric elements which I installed initially. The only modification has been the cutting down of wattage to 25 for the 18", 50 for the 24" and have stayed with 100 for the 30 and 36" bottom layer. Bought one of these 1500 watt oil filled electric room heaters. When Joan thought it was inefficient in the living room I thought it would go to the fish house but it has proved too useful to dry kids' clothes on wet days so that was the end of that thought. In the past month or so I have installed fluoro lights over all the tanks. I wired up the room so that all the ballasts were down low in the corner spaces between tanks so that there is about 600 watts for air heating while the lamps are burning. One might as well get their money's worth out of the light bill. Have had a lot of criticism about the type of tubes used because I have gone for Osram "White" mostly because they give the best overall illumination and light penetration and do not seem to be too bad on colour - neon tets still look like their proper colours. I get away with one 20watt strip to every 2 ft. The whole outfit looks very good at night with total illumination of the room coming out of the fronts of the tanks. Have yet to find out how the plants will react. Despite various notions to the contrary about fluoro versus tungsten, I have kept in mind that our lab always used fluoro whites for all their culture work but may get away with this because they burn their lamps for the full 24 hours.

The alarm bell on the PMG line from our salt water aquarium system at the lab is ringing merrily now I have settled down to this letter so I better finish off quickly and go and see what is wrong. Have had calls in torrential rain at 3 am for 3 consecutive mornings so am not very happy.

Will do my best with the Blue-eye identification if you can send specimens. All my stocks of the northern species have been promoted to glory and have had an infection which has practically cleaned out the Frank Lewis jobs which I was very proud of.

Incidentally I can claim a small fragment of thanks for that article in the Women's Weekly. The Sydney reporter worried the soul case out of me for about 3 weeks checking and cross checking on points for this and that - phone calls nearly everyday. The Sydney edition was short of the last two photos which I thought rather a pity but they sent me a complimentary copy of the Vic edition.

Would like to receive the promised Melanotaeniids from the Katherine. Anytime would suit but please send a wire and mark package "Hold Mascot, Phone 523-47517. I have some young *rubrostriatus* which I can send you. However it would be best if you can be patient for a week or two on these because I have a bit of white spot (from where I can't imagine) or something which I would like to clear up before I distribute it elsewhere. The tanks containing the fish concerned are clear but I would like to see it gone from the other tanks just in case. Have only a few *maccullochi* now, not enough to spare. Bob Gray, one of the others on the Fish Import Committee, told me the other day that he has a brood and we might be able to get some through him. I am really quite surprised that you have not already had this well-known species.

I have received a copy of Gilbert Whitley's article on the Australian gudgeons. If you like I will write a short review on it for 'finchat' that is if this is the sort of commenting you would like from me. I have not more than casually looked through it to date. He seems to have generally covered the subject but it might be rewritten in a different form to be of particular interest to aquarists.

Well Ron you will have had enough by the time you have wandered through these several pages of rambling. That bell is still ringing so I better get the car out and see what has gone wrong, Will look forward to these Melanotaeniids and let you have an identification. Hope that they turn out to be something that I know.

Regards to all,

Ian S.R. Munro

Australian Aquarium Fishes

by Frank Lewis

I have often wondered why most Australian aquarists never have any Australian indigenous fishes in their aquariums, and I think that this is due to one or all of these four reasons. (1) They do not know that Australia has suitable fish; (2) If they see the Latin name, or local popular name, it means nothing to them, as they do not get a mental picture of the colour or shape; (3) If they have had them, they do not know the conditions under which to keep them, so that they show full colour and deportment; (4) There is no popular textbook on their habits, with pictures, such as there is for imported fish.

Because the two species of Rainbows are mentioned in overseas textbooks, most Australian aquarists think that that is the sum total of our aquarium fish. How wrong can you be? In a list given to me by Ian Munro, chief of the C.S.I.R.O. Marine Laboratory, New South Wales, he quotes about eighty species, out of which I recognise about forty species that make either quite pretty aquarium fish, or have extremely interesting characteristics. Let us look at a few of these and see what we know about them.

The Moreton Bay Rainbow, *Rhadinocentrus ornatus*. Its appearance is similar to the ordinary Rainbow, but is more slender in body, shape; its anal and dorsal fins start about one quarter of a body length from head and the extremities of these fins run in two parallel lines, with red edges. Body colour is blue green above lateral line and whitish below lateral line. A bright green line follows its shoulder curve, and is very attractive. Its disposition is calm and peaceful, a wonderful community fish. In its natural habitat it has cool, running water, mostly neutral and soft, but sometimes found in dark brown acid water. It breeds either singly or in community and does not eat its eggs or fry. Full size about 3½ inches.

Southern Blue-eye, *Pseudomugil signifer*. This is a small fish, maximum length about 1½ inches. Its body is transparent yellow except for the intestine portion, which is white; the dorsal fin is long and curves backwards, this and all the other fins being yellow to orange. The lateral line is brown, its disposition lively and peaceful. In its natural habitat, it frequents the banks of slow moving streams. It is found in mostly medium hard water with pH neutral to about 7.6. It breeds easily in well-planted tanks, but it will eat its eggs. Frequents salt water.

Northern Blue-eye, *Pseudomugil signatus*. This is very similar to *P. signifer*, but grows larger, to about 3 inches, and like the above, also frequents salt or brackish water at times. However, *P. signatus* has longer flowing anal and dorsal fins and the lateral line gives the appearance of a broad, gold line, with evenly spaced black checks along it. Peaceful and lively disposition, and also breeds easily. In both these species they get their name from the startling blue circle surrounding the pupil of the eye. About the only other fish in the world with a blue eye is the Golden Medaka, or Rice fish.

Smelt, *Retropinna semoni*. This fish is a long, thin fish, bright orange in body and finnage colour, with the exception of the intestine sac, which is white. As its name *Retropinna* suggests, the dorsal fin is small and starts at about two-thirds of the body length from the head. This fish is generally found in the larger fresh water streams, in running water; there are two colour variations, one yellow and one deep orange – the

latter one is much stronger and lasts longer in the aquarium. These fish do not do well in small tanks, but do very well in the larger tanks when there is plenty of surface area free of floating plants for them to swim just under the surface. I know nothing about this fish's breeding habits.

Melanotaenia fluviatilis or Queensland Rainbow. This is the normal Rainbow found in northern N.S.W. and right on up to Rockhampton, and also inland on the Darling Downs. There seems to be some doubt as to whether the one listed in Innes and other such books is not this fish, instead of *M. nigrans*. However, the picture in Innes describes this well.

Melanotaenia maccullochi, or McCulloch's Rainbow. This is correctly described in Innes; however, if you want those brown fins and horizontal stripes to turn bright red, try keeping it for a while in very soft water with a pH from 6.0 to 6.5. You will get a pleasant surprise.

Craterocephalus stercusmuscarum, or Fly-specked hardy head, or Atherine, Pencil fish or Jewel – depends on what popular name you prefer. This is a long (up to 4 inches) tubular fish, with a pointed head, something like a sharpened pencil. Above the lateral line it is olive green and below it is grey green. Its lateral line consists of parallel gold, green and black bands. Its disposition is peaceful and lively, wonderful community fish and quite hardy, once it has settled in. It breeds easily in large, outdoor ponds, but I have never tried to breed single pairs inside.

Selenotoca multifasciatus, or Silver Scat. Described in Innes. This fish is generally available only from January to March each year.

Scatophagus argus. Also described in Innes. Available north of Rockhampton January to March each year. All of the scats are salt water fish, but come into brackish water each year to breed around Christmas time. If they are kept in water as follows, they live for years if fed well. Total hardness about 150 ppm or more; pH no less than 7.3; salinity of not less than 100 ppm – which will not even harm most plants. Their food must consist of some green stuff, such as algae or shredded lettuce; they are big eaters, but are well worth the effort, as they become quite tame and will eat out of your hands – in fact, if you hold the food about half an inch out of the water they will stick their heads out and take it from the hand.

Monodactylus argenteus, Silver Batfish. Described in Innes. This fish is plentiful from Sydney all the way up the coast to Cairns – in fact, all the way up to New Guinea, I would say; but Sydneyites can see them playing around the piles of the wharves and possibly they may be in Melbourne – I have never looked there. These also make wonderful pets and are good community fish when with big fish. When young, about the size of sixpence, their dorsal and anal fins are tipped with red and the body is nearly all black – quite a pretty fish. These young fish are found in plant clumps in brackish water and even where the tide has minimum effect, the water being sometimes brackish and sometimes fresh.

Ambassis agassizii, or Olive Perch. This is a perky little fish about 3 inches long and a deep body about 1 inch deep; the body is translucent except for the intestine sac, which is silvery; like the Rainbows and Blue-eyes, it has two dorsal fins, but where they have the post dorsal as the major sized fin, the Olive perch has the first dorsal quite large, and the post dorsal about half the first dorsal size – when the fish is in good condition, it spreads all its fins, which are edged in black and looks very smart and cheeky.

Ambassis agrammus, Northern Olive perch – same as above, except the front dorsal fin is extremely high and grows bigger in body size.

Glossamia aprion gillii, Queensland Mouthbrooding Perch. A big, ugly fish, eats anything it can fit in its huge mouth; extremely interesting in breeding habits, as it protects the young fry by hiding them in its mouth, which has rows and rows of galleries, into which the young lodge themselves.

Kuhlia rupestris, or Rock Flagtail. A very attractive fish, which grows to at least nine to twelve inches in the wild state, but if obtained small seem to stay that way in the aquarium. The body is somewhat mullet shaped and is silvery with small, brown checks uniformly covering the sides. Its main attraction is the caudal fin, which has markings very similar to the Scissor tail, but the black markings are much wider in proportion. Found in rocky mountain streams, with soft, cool, neutral water. Probably would not breed until quite large.

Madigania unicolour, or Spangled grunter. This has a body shape similar to the above, but body is brownish gold colour, and is uniformly covered with small brown-red spots – very attractive fish when small, but pugnacious when large. Grows to about eight inches in nature, probably bigger.

Amniataba percoides, or black striped therapon, or grunter. Similar body shape to above, but has silver body, with five vertical, broad black stripes. Caudal and anal fin edged in yellow.

Notestes robustus, or Bull rout. When large, this becomes a dangerous, ugly type of Rock Cod sort of fish, with a deadly sting; but when about one to two inches is very pretty with dark brown body with irregular, creamy white vertical stripes. It will also try to camouflage itself and change colour when placed against different backgrounds. Seems to be a good community fish when small, but is not always lively and sticks generally around the bottom of the tank. Evidently breeds in brackish water, as the young are always found in such water.

Hypseleotris compressa, Empire Gudgeon. Grows to about four inches in nature and generally drab, but if some attention is given them, it is possible to keep them in colour for months at a time, and then they are a sight to see. The rather tubular body becomes flushed all over with a deep red rosy hue, while the dorsal and anal fins stand out with even black bars, edged with a white broad tip, in fact they always remind me of an Indian chief's headdress.

Hypseleotris gallii, or Firetail Gudgeon. One of the smaller gudgeons, growing to about three inches in nature. The body is somewhat tubular, and olive green in colour. All of the fins are blood red and it is very attractive. No research on breeding habits has been made, but just after spring thousands of young Firetails can be obtained in practically any muddy creek where the water is fresh. pH or hardness does not appear too critical.

Periophthalmus barbarus, or Mudskipper. This is our famous, Northern tree climbing fish; grows to about five inches long and is described in Innes. This is a very pretty fish, especially its two dorsal fins, with the red tips. This fish is ideal for the Terrarium tank, as it must climb out of the water periodically. Its periscope eyes, with independent eye movements, are intriguing. Breeding habits not known.

Well, there are several species of pretty, interesting fish and, of course, there are many more. The ones mentioned are fairly easily obtained; those not mentioned are rare, or in inaccessible places and that, of course, is one main reason why they are not seen in aquariums.

It is with interest that I read that the A.S. of V. was conducting some experiments with native fish, and I hope their T.A.G. write some of the species up so that aquarists can keep and breed them, so over to you, T.A.G., for some specific articles on a specific fish.



Front Cover of the November 1961 Issue of FINCHAT.

Page 3 of the same issue contained the following statement re the cover:

COVER PHOTO:

Melanotaenia fluviatilis, (yawning)

This Australian Rainbowfish is almost certainly the fish incorrectly named in Aquarium Books as *M. nigrans*.— Photo by B. Hoffmeister.

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

NOVEMBER 30, 1961

Dear Ron,

Like the elephant I never really forget but usually I am horribly late in getting around to things. Must apologize for this long delay in acknowledging receipt of those Katherine River Rainbows which arrived here safely perhaps two months ago. I have just realized that it must be over three weeks since Frank Lewis raced through here on his way back from Melbourne and reminded me that you were anxiously awaiting a letter of comment on these fishes. Truth is that I have not really had a minute to breathe properly in the past few months and everyday I seem to get further buried under an ever increasing backlog with which I have just about given up hope of coping. Have had to do a terrific amount of work in connection with this Advisory Committee in Importation of Live Fish and the job at the lab here seems to become very demanding and hard on the nervous system. Don't ever be fooled that scientists live in a little abstract world of their own oblivious of clocks and calendars.

Things have been busy on the home front too with the arrival of Moira Jane on 4th inst rounding off our family at four in boy-girl-boy-girl sequence. She is the perfect baby who causes the least possible interruption to the domestic scene but has made the accommodation problem rather acute. I think I said before I was about to take a trowel in hand and start laying bricks to get an extra bedroom. This is not quite as simple as it may seem due to lack of finance and do-it-yourself, and has involved major demolition and relocation of kitchen and laundry. The kitchen at least is about finished and I am now waiting for a break in the ghastly weather to start digging for the foundations of the new part of the building. Probably be about six months at least before things begin to take much shape and the house looks less like a bombed out site. Net result for the time being is general neglect of the fish house. Have had a bad spell with this with tanks getting too acid, loss of far too many fish, tanks being consumed with algae, lack of live food, and probably general mismanagement on the whole. Lost my *Daphnia* this year probably on account of a friend using my workshop and washing off the zinc chloride from a copper fuel tank of his yacht in the pool. However the Katherine Rainbows are doing fine and when I get cleaned up a bit in the fish house I will give some thought to breeding them.

I am not terribly certain about their identities but think that they must be examples of *Nematocentris australis* (Castelnau). This is the species described from the Swan River, W.A. where no *Melanotaenids* occur, and it is now assumed by ichthyologists that Castelnau's material must have come from some point further north. I have seen a variety of preserved material from the Fortescue River around to the W.A.- N.T. border but unfortunately these have lost colour and very considerably in body form and persistent markings. I think the Katherine River specimens must be the same because they fit in with the others in fin counts and pattern. Dr Gerlof Mees who is curator of vertebrates at the Perth Museum personally collected much of this material. He passed Cronulla a few weeks back and I gave him a look at your specimens. He did not think they were the same in view of the bright red finnage. Previously he sent me colour notes on one sample from the north-west (field notes in Dutch just to make it hard) which looks like a weakly marked *australis* but is said to have the caudal and other fins light brownish-yellow with orange spots and blackish borders. One lot of material from King Edward River, Kalumburu, in the preserved state has markings which are a fair match for *N. ogilbyi* from Lorentz River, south Netherlands New Guinea. Whether all these specimens belong to a single variable species subject to

colour difference due to environment, or whether we have a species cline of some sort, or a complex of species is something yet to be determined. Looking at the location of the Katherine River there seems little reason to doubt that *australis* might extend at least this far to the east. If this is so then it is possible that *Quirichthys* might turn up elsewhere in the north west, even on south Dutch New Guinea. There seems to be evidence in several fish groups that there is a difference in the faunas east and west of some point a little west of Darwin. Dr Mees has an aquarist friend in Perth who had some westralian rainbows from somewhere north and it was arranged that I should receive a pair or two. However, I lost about six months in my usual slowness of correspondence and missed out. Apparently his stock has diminished and he is desperately trying to breed from what is left. I hope he gets enough to send some over so that I can get an idea of the colours for matching with the Katherine ones. For the time being I am accepting that *australis* is a distinct form and that the Katherine River stock belongs to that name.

I have not forgotten about the Torres Strait Rainbows of two species which I am to send you. However, I have mislaid the instructions on where I have to send them and details of advice. Would you mind reminding me? I have promised some to Frank Lewis too and must make the effort towards the end of next week and send both batches off. My *nigrans* are getting a bit senile as I must send off a few pairs in several directions to those who are likely to make efforts to breed them. I was to get another batch from Thursday Island before we close down our station there but nothing has turned up to date. The only *nigrans* I have lost are those which get curvature of the spine and waste away wriggling around in a vertical position. They are not big fish but I think it is mainly due to old age. My stock is getting down a bit through this cause. Bob Gray gave me a batch of fry of *maccullochi* but these do not seem to be happy. When he first brought them down they had velvet which he treated before handing them over some weeks later. We reckoned that you would not want any in this condition. They are clean now but seem to be dying off and I am not happy about them. Frank Lewis said they were of the colourless type and not as good as the ones he now has. If you have not got any *maccullochi* yet it would be better to get the brighter ones direct from Frank. Must finish here with these few words.

Best wishes to all in Melbourne,

Sincerely

Ian S.R. Munro

P.S. - Yes there was something else on my mind. Received a letter a few days ago from J. Y. Costeau. Director, Institut Oceanographique, Monaco re the International Congress of Aquariology last November. He says there are about 80 papers to be published in four separate booklets. The first issue will probably be ready before the end of this year and I will be kept informed of the dates if publication of the others. Will let you know more later.

A THOUSAND RARE FISH ON SHOW

More than 1000 fish of 70 species are on view in the Exhibition Hall, Garden Plaza, Chadstone, in the largest show of tropical fish ever staged in Australia.

The exhibition by the Aquarium Society of Victoria will be open daily until February 17 from 10 a.m. to 10 p.m., and from 2 p.m. to 9.30 p.m. on Sunday.

The organiser, Mr. Ron Bowman, who lives in Chadstone Road, Chadstone, said that since the Melbourne Aquarium was destroyed by fire in 1953, the Aquarium Society had been concerned at the lack of aquarium display facilities and was setting about arousing interest in the building of a new aquarium for Melbourne.

To stimulate this interest and whet the appetite of the public for studying these creatures, the society has organised the exhibition, the first of the type to be presented in Australia.

Keen aquarists in Queensland had co-operated with the organisers, catching and transporting many beautiful examples of Barrier Reef fishes.

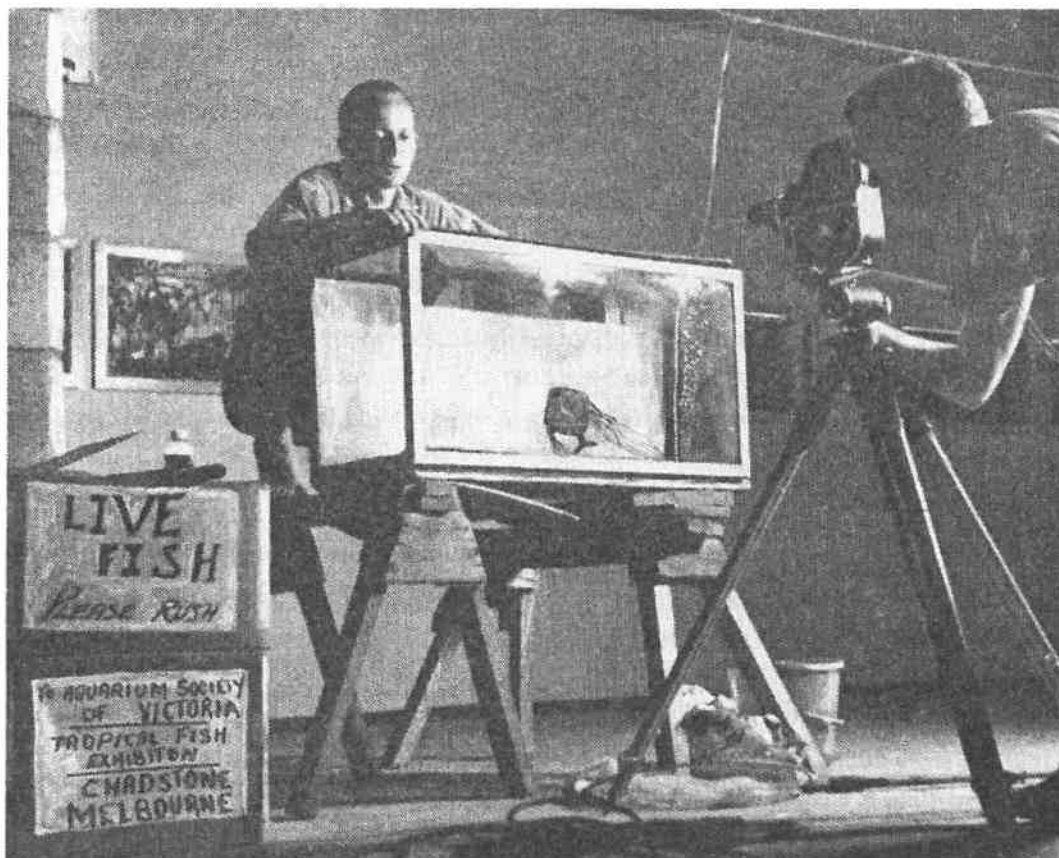
Four aquariums are used to display these, and another two are used to display some colourful fishes collected in our Victorian waters.

The main section of the display shows representative species from tropical Africa, South America, Mexico, India, Malaya, Siam, China, Japan and also the tropical area of Australia is represented by seven freshwater species.

One of these fishes, popularly known as the Katherine Rainbow, is being shown on display to the public for the first time in the world.

It is only a little over 12 months since this fish was first caught and flown out of Katherine, in the Northern Territory, consigned to the fish tanks of Mr. Bowman, who has since bred the fish.

AS PUBLISHED IN THE *SUN NEWS PICTORIAL*, JANUARY 1962.



Channel ABQ2's Gold Coast cameraman Scott Derrick records for TV newsreel a shipment of Marine Tropicals being shipped to the recent A.S. of V's Chadstone Show by his brother Ian. The fish "on camera" is the beautiful Blue Ribbon Fish (a member of the Trevalli family) and the "streamers" from the dorsal and anal fins are up to two feet long. Unfortunately, both fish died prior to shipment. However, although "rare", an attempt will be made to capture another pair for T.A.G.

THE CHADSTONE STORY

THE IDEA:

The Chadstone Aquarium Exhibition first eventuated when Mr. Bert Mulcahy of the Chadstone Shopping Centre management rang Ron Bowman after seeing the tropical fish article in the *Australian Women's Weekly*, July 1961, with which Ron had been largely concerned.

"Could Ron exhibit his aquariums at Chadstone?"

No, Ron could not, but he thought the Aquarium Society might be interested.

Ron warmed Cecil Davis to the idea, and the details were put to the next A.S. of V. Council meeting.

PLANNING:

R.B. conceived the idea of using island stands, on which the aquariums were to face in alternate directions, providing people with room to view each exhibit. (See cover photo.)

The stands and tanks, including outside of back glasses, were to be painted dull black, a feature very necessary in the all-glass Chadstone Exhibition Hall. Indoor plants were to be used to soften the functional lines of the stands. Each tank was to display no more than two fish species, with nomenclature and details of each displayed on cards above the tank for the interest and education of the public.

Some four months before the exhibition date, members were told of the fishes that would be required, and a list was compiled so that members could grow their fish to a mature size.

WORKING BEES:

The first working bee was called some two weeks before Christmas, and the sparse attendance at the Showgrounds Aquarium left a lot of work to a few.

The spartans who cleaned out all the tanks, washed and bagged the sand, were Jim and Edna Keenes, Ray Kirkwood, Theo van Schlam and Clive Manson.

The work was completed early in the New Year by Bruno Hoffmeister and Bernard Gillhoff.

No doubt the inconvenient time of the year was to some extent to blame for the lack of attendance at this effort.

Must mention Tom Scott for some good transport work with the sand.

Ron Bowman consulted with Theo van Schlam on the job of listing and describing the 70 fish species. Theo did much preparatory work, and this enabled Ron to complete the considerable task during a beach holiday.

Ray Kirkwood supervised the type setting and printing of the cards, and Jim Keenes made the tinfoil frames which were to carry them above the tanks. Here are two examples of the 70 cards that were done:

NEMATOCENTRIS AUSTRALIS

Popular Name: Katherine Rainbow.

Range: North-Western Australia.

Size: 4-inches.

Temperature: 70-85 degrees. Freshwater. Breeding: Eggs hang from plants by adhesive thread, are laid daily for several days. Breeders are removed after seven days.

The first time this species has been displayed to the public anywhere in the world.

PERIOPHTHALMUS BARBARUS

Popular Name: Mudskipper.

Range: Tidal areas Northern Australian coasts, East Indies and South Asia.

Size: 6 inches.

Temperature: 75-82 degrees F. Brackish to Freshwater.

Breeding: Not known.

These fascinating fish illustrate the stage in prehistoric times when some fish adapted to leave the water to hunt for their food.

Saturday afternoon, nine days before opening, the tanks were transported from the Showgrounds to Myers (Chadstone) roof by Bill O'Donell of South Suburban Taxi Trucks as his contribution to our effort. On arrival they were taken by trolley and lift to the reserved area on the roof, where they were sandpapered and painted by a good sized group, including several keen, young associate members.

This work was completed at 1 p.m. Sunday. Next time you have forty or fifty tanks to paint, whip a roller-coater onto them – take it from us. Apart from the need for some small brush work in the corners, the 'coater does the job to a very high standard.

Saturday, the 3rd of February, saw R.B. at Chadstone at 11 a.m. checking on last-minute preparations, and buying screw eyes and things as they came to mind.

Then it was on.

One group went to Myers roof and began loading the tanks onto the trolleys.

When the taxi truck arrived the stands were quickly unloaded and set out in their positions. Tanks were being scrubbed and checked for leaks on the footpath – they mostly leaked, some nearly as fast as they could be filled. Soon the tanks were going on the stands, sand was going in and a team with hoses began filling. Leaks "took up" after a while.

Jim, Tom Scott and Flo Bush arrived with the sea water, and soon the five marine tanks were ready.

Telegrams from Frank Lewis and Ian Derrick were on hand, and Flo and Marj Davis went out to the airport for the Queensland fishes. Frank and Ian deserve our warmest thanks for their efforts in providing variety in the marine section.

The airline team had the 96 feet of tanks serviced with air, and the old "chuffer" was pushing out the air in fine style.

Late Saturday night we all became actors for Channel Nine's "Nightwatch" cameras.

Sunday: disaster when two 8-inch Silver Scats were found dead in the marine tanks, also the Parrot fish, Striped Catfish and Angler fish.

The 10-inch Black Scat was lying on the sand gasping, but quick action by Ron revived him and he suffered no ill effects.

It was later found that a power pole had burnt in a car smash and all power to the district had been off for several hours during the night, causing oxygen deficiency in the marine tanks. The smaller marines were O.K.

Rocks and plants went into their tanks. Incidentally, forgot to tell you that all the rocks were collected by Bruno Hoffmeister, Chris Butson and Ron Bowman one Sunday afternoon in mid-January.

All the fish were in by 3 p.m., and then the cover glasses and reflectors were assembled, with Ron Bradley and Charlie Bush to the fore.

Then the cards had to go into their holders, and then onto the tanks; who loaned which fish also had to be stuck on.

The survivors raced round to the Bowman TV at 10.30 to see the News (also saw the burning pole which caused the overnight casualties).

When midnight arrived Theo still had some energy and a pretty good pen lettering style. R.B. was out on his feet and mighty glad to have Theo finish off the "No Smoking" and "Don't Touch the Glass" signs.

The doors opened at 10 a.m. on Monday. No further fish had been lost, and we were all pretty excited about the prospective impact of this show.

The Exhibition was officially opened by the Mayoress of Malvern at 2 p.m., and after Ron had shown her the exhibits, she was taken to afternoon tea by Mesdames Bush, Keenes, Davis and Bowman.

Indoor plants were graciously loaned by Rowena Nurseries at Chadstone.

Here is a run through of the tanks and what was in them for the Chadstone Aquarium Show:

Tank No. 1: Oscars, Albino Catfish. 2: *Cichlasoma severum*, *Aequidens tetranterus*. 3: Angels, *Leocassis siamensis*. 4: Tinfoil Barbs, Lepto Barbs. 5: Lace Gourami, Blue Gourami. 6: Kissing Gourami, Thick-lipped Gourami. 7: Australian Katherine Rainbows, Blue-eyes. 8: Black Scats, *Mogurnda mogurnda*. 9: Tiger Barbs, *Corydoras aeneus*. 10: Nigger Barbs, Gold Barbs. 11: Cherry Barbs, *Corydoras paleatus*. 12: Pearl Danios, *Corydoras rabauti*. 13: Checker Barbs, Ticto Barbs. 14: Zebras, Hoplo Catfish. 15: Neon Tetras. 16: Glowlights, *Corydoras julii*. 17: Blind Cave Tetras. 18: Pristellas, Flag Tetras. 19: Harlequins. 20: *Rasbora maculata*, *Rasbora pauciperforata*. 21: Archerfish. 22: Mudskippers. 23: Tropical Marines. 24: Black Scats, Silver Scats (Marine). 25: Local Marines. 26: Goldfish: Lionheads, Celestials. 27: Black Moors, Fantails. 28: Comets, Shubunkins. 29: White Clouds, Medakas. 30: Firemouth Panchax. 31: Spiny Eels. 32: Kribs. 33: Moray Eels (Marine). 34: Small Tropical Marines (later replaced by freshwater, featuring Blue Calliurums). 35: Red Tail Sharks. 36: Swordtails. 37: Platys. 38: Mollies. 39: Guppies. 40: Siamese Fighters.

Tropical Marines in tanks 23 and 34 fell victims to a marine version of rust disease, and were replaced by freshwater species.

One wall, 44 feet in length, was provided to dealers, who displayed several Tropical Community set-ups. This section fell short of expectations, but it is hoped that the potential here may be realized in future shows.

HEATING:

Thermostatically controlled floor heat in the tiled floor meant that the whole Hall became a giant fish-house. Myers loaned three Travellair Room Conditioners and two large fans to help with cooling. Veals of Chadstone loaned three small fans, and buckets of crushed ice were used in the tanks on a couple of really hot days.

STAFFING:

The Society employed staff of Manager and Ticket Secretary, the two Managers alternating six-hour shifts. (The Exhibition was open from 10 a.m. to 10 p.m. Monday to Saturday, and from 2.30 to 9.30 p.m. on Sundays.)

FEEDING:

Two 3-foot tanks were kept stocked with Daphnia and Guppies for satisfying the hunger of the masses. A packet of fish bait was bought at M.S.D., Chadstone, and held in their deep freeze for feeding to Marines.

DISEASE PRECAUTIONS:

A bucket of antiseptic solution (Dettol) was used for nets and to wash hands. This kept small outbreaks of White Spot and Rust disease localized and loss of fishes were very small, except for an unfortunate accident to one tank involving Malachite Green.

PLANTS:

Members sold available plants to the Society, and were issued with receipts for their plants. After the show these plants were sold to members at the purchase price. It is recommended that in future a small margin be allowed, otherwise a loss here is inevitable.

Generally it was realized that most tanks were over planted, with some fish hard to find.

PUBLICITY :

Free publicity on a news basis is available with the right approach.

Television coverage on "Nightwatch" had the greatest impact, with further spots on the News on Channels 2 and 7.

Press mentions were obtained in the "Sun" (with photo) and "Age" (Alan Nichols' column) and follow-ups on the spawnings of *Mogurnda* and *Severums* were obtained in the "Age" (Alan Nichols again) and the "Sun" (Keith Dunstan's column). No publicity was obtained in the large evening paper "The Herald", except for one insertion in the "Where to go on Sundays" section.

Radio was neglected, and much could have been done here with a positive approach from a women's publicity group to the various high rating women's sessions.

ATTENDANCE:

All records at Chadstone were broken in the first week, but second week was quieter.

Chadstone and Myers' officials, however, were thrilled with our effort, and we were asked to run a third week. Lack of follow-up publicity meant that poor attendance this third week only just covered our running costs. Admission was 1/- adults, 6d. children.

We were disappointed that only two of 600 schools notified sent parties of children through.

CLOSING :

The Exhibition was completely dismantled in six hours on Sunday, 25th February.

Tanks and stands were taken back to the Showgrounds.

Lack of manpower at the Showgrounds was the only unfortunate blot on the day. The three stalwarts there were left in the air, but showed some good Australian ingenuity in coping with their problems. Bradley, Busby and Bissett – fine fellows all.

SUMMARY:

Chadstone taught us more about running Exhibitions than any other effort, and should be the forerunner of some very successful fundraising efforts. The Society's goal is coming into clearer view now ... that of establishing our own clubrooms.

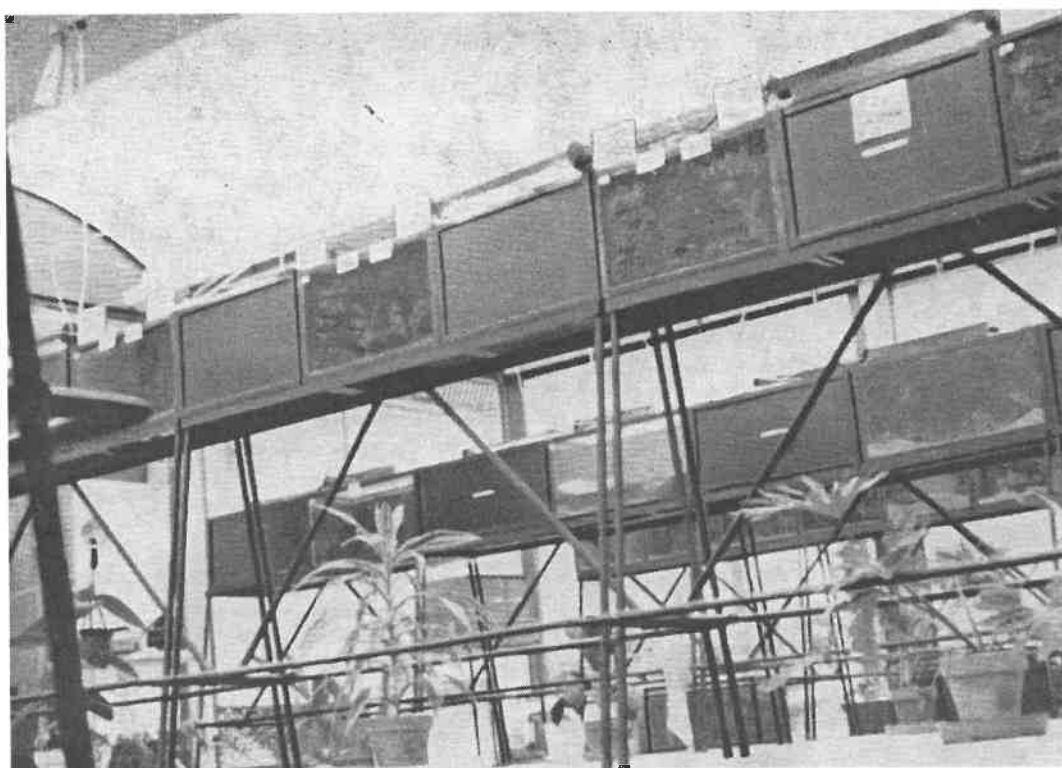
Our other target of a public aquarium for Melbourne has had some attention paid to it through this effort. The public is more fish-conscious, and further exhibitions may well bring us to the point where such an aquarium is demanded.

The assets realized from Chadstone are our new stands, cash in the bank (shared by ourselves and the Cultural Centre) and, most important of all, experience.

Members who supported Chadstone know now how much was gained by contacts made with fellow members – how much better these members know and regard each other – this is their reward. Those members who let the Chadstone effort pass them by are all the poorer for it. We hope to get to know them next time.

To all those members who helped to make Chadstone the success it was, the Society says thank you – we are proud that you are one of us.







Previous pages include images by Ron Bowman taken at Chadstone – the “young” man pictured above left is none other than ANGFA Victorian member, Ian Stewart – the Chadstone Fish Event must have certainly had a “lasting” effect on Ian.

Mr Ian S.R. Munro
C/o C.S.I.R.O. Marine Lab
Box 21, Cronulla Sydney
NSW

49 Chadstone Road
Chadstone SE 10
10 April, 1962

Dear Mr Munro,

I am hoping you may be able to supply me with some names and addresses of Curators or directors of 2, 3, or 4 of the world's leading Aquariums.

Given such contacts, I hope to persuade them to provide some basic information for our group (the Melbourne Oceanarium and Research Foundation) to work with for our presentation to the Victorian Government.

How are the *Nematocentris australis* going?

Any family?

And the fish room construction?

The T.A.G (TECHNICAL ADVISORY GROUP) within the Aquarium Society of Victoria is being elevated to a Senior Society level - if you ever think of any project T.A.G. could work on don't hesitate to put it forward - I am optimistic about the possibilities of this group.

R.L.B.

C/- C.S.I.R.O.,
RESEARCH STATION
KATHERINE, N.T.

July 4th. 1962

Dear Ron,

It was indeed a pleasant surprise to hear from you again and I really feel ashamed of myself for the long delay in writing and doing all those things, which I promised. Truth is, Ron, I hardly get enough time to scratch myself. Almost every week I say "well I should get a break now and catch up on everything" but always something comes along and there goes my good intentions. In fact I have been the world's No 1 procrastinator.

Life up here during the past 18 months has been crazy with conferences, visitors and traveling from one place to another. Northern Territory appears to have become Australia's No 1 agricultural hotspot. Here in Katherine five experimental (pilot) farms are being opened plus two up near Darwin. Thomas Playfair & Sons are opening an export meatworks also in Katherine with Hooker and Killen (both of whom own almost as much country as Vesteys). Of course this keeps us all busy as advisers in various fields. CSIRO are also opening three more experimental areas 150 miles north of here as the sites are different soils and higher rainfall areas. The Research Station at Darwin (Rice) is now in full swing except for staff. With all these things I have been kept extremely busy.

Apart from all this John Mulvaney at Melb. Uni is coming up here next year with a team of archaeologists from other unis and museums and this has also kept me busy with certain preparatory work as they are getting a special government research grant for the work they are going to do up here. Earlier this year I had to make a rush trip to Sydney due to a serious family illness and although I was away only ten days it did throw me out of gear.

On 16th this month I have to go over to our Kimberley Station for a week's Annual Conference. Return here on 29th. And link up with N.T. Reserves Board Members (I am now a member of this Board) to survey areas around the top part of Nth. Aust. for possible national parks and flora and fauna reserves. This will finish in Darwin with a two day conference, then back to Katherine to set down two field experiments and get them going before the next rains set in. And so it goes on and on and on.

Quite frankly it is getting me down a little as I have too little time for relaxation, it costs me money and I am unable to do all the things, which I want to do. So please, all of you down there, don't think too harsh of me, I will get around to doing all the things I should, ultimately.

Now to answer some of your questions; I assembled three of the aquariums, caught some Blackmasts etc. but had to go to Alice Springs and my "mate" forgot to do all the things I asked and so they all died. Haven't had the chance since to do anything positive, but will do my best before the coming wet season. Was thrilled about the "Katherine Rainbow" and will try and send a few more.

I am sure there are interesting varieties of small fish in Nth. Aust. You may be interested to know that "Blackmast" exists in most Nth. Aust. Creeks and rivers. I have seen him at Howard Springs, 30 miles south of Darwin. Also in the Cullen, Ferguson and Edith Rivers. He is also at the Katherine Gorge and can be seen at most places along the Katherine River. As yet I don't know if he exists south of Katherine

but the indications are that he does as most of these rivers connect. If you look at a map you will see these places which I have mentioned. One thing is certain and that is he does exist in most Nth. Australian waters. A few weeks ago I saw fish which were about 3-4 inches long; some had blue tails and others red.

The significant thing about all this is that the pH of the water in all these places varies. For instance the water at the Katherine Gorge, which originates from sandstone, is 11 pH. The water at the Low Level Crossing (where I collected the fish you received) is very high. The water in some of the gorge (100-150 miles) is almost pure by virtue of its travel). Whether fish have the ability for quick adaption from high to low pH or not remains to be seen.

At the Low Level Crossing (Kath. River) Blackmast is very timid and will not come near you. At the "Donkey Camp" about 10 miles up stream he is very friendly and will flock around your legs, and appears to enjoy "sucking" at your skin. Now the pH at the Donkey Camp is low and at the Low Level very high. On the other hand there could possibly be a Sodium factor. Water at the Low Level originates from underground springs (say 90% of it anyway) and contains relatively high amounts of Magnesium and Sodium (obtained through the dissolving of the limestone) Water further up stream, which does not originate in limestone, but from catchments on and from sandstone is low in magnesium and sodium. Now this could possibly account for low level Blackmast's distaste for "salt" or in other words the addition of salt increased the sodium content to the point of being toxic.

Blackmasts' friendliness at the Donkey Camp could be because of his desire for the salt from one's legs (sodium). Of course this is only a theory but I feel that it is worth following up. You may often notice that animals will often lick you if their salt diet is low. Anyway Ron I wouldn't mind having your opinion about this.

Unfortunately, the plastic bags which you gave me have been mislaid, I had them in my laboratory but apparently some one has used them at some time. If you could send me a few more as soon as possible I will send you down some fish from a) Low Level Bridge b) Donkey Camp c) Katherine Gorge d) places further north. If you could get them to me next week it would be a help. I will do my utmost to make amends to you all.

I'm pleased to hear that Audrey is well and give her my best regards. Your son is growing eh? Please convey my best wishes to him for his birthday. Also give my regards to Fred Parkes and Brian and all at Aldwych - I do often think about you all down there even though I don't write. Hope to hear from you soon, I will do my best Ron - I promise.

Yours sincerely,

Bob Wren

C/- C.S.I.R.O. MARINE LABORATORY,
BOX 21, CRONULLA, SYDNEY.
AUSTRALIA

July 10th, 1962

Dear Ron,

Being the end of the financial year and having not succeeded in attaining my several goals and having got my office, stacked feet high in books and papers like the proverbial professor's desk, I knocked off for a few hours last week to disentangle the jungle. To my horror I found 3 closely typed pages of letter to you dated April 26, unsent, sitting under a great heap of other papers. How I came not to post it remains a mystery. I am very sorry about this and had planned to write a new letter tonight now I have clear of tax returns, bills, medical benefits claims, calculations for roof timbers and other pressing items. Your letter came in at lunchtime today and made me feel more ashamed than ever. The first bit of my unsent letter deals with the information you wanted on aquarium contacts so I will cut this off and pin it on to this note. This fixes your item No.1.

Item No.2. Nomenclature of the Melanotaeniids. The position is simply this. The fish generally called *Melanotaenia nigrans* by aquarists is not the *Atherina nigrans* from Port Essington described by Sir John Richardson about a century ago. *A. nigrans* is the type species of the genus *Melanotaenia* Gill 1862. My research on the type specimen of *A. nigrans* Richardson in the British Museum reveals that it is identical to a species which occurs from at least as far west as Darwin to Cape York Peninsula into Southern Papua, and belongs to the group of Melanotaeniids with different dentition variously placed by authors in *Rhombatractus* Gill 1894 or *Rhombosoma* Tate Regan 1914. Identification of the type species of *Melanotaenia* as a member of the second group of species makes the name *Melanotaenia* applicable to this group and not to the one containing the species known to aquarists as *nigrans*, namely *fluviatilis* Castelnau. Introduction of *Melanotaenia* is prior to the other two generic names mentioned and thus has nomenclatorial priority for *nigrans* Richardson, *goldiei*, *affinis*, and some other closely related forms from New Guinea. The type species of *Rhombosoma* is *novaeguinea* which is a synonym of *goldiei*. This makes *Rhombosoma* Regan an absolute synonym of *Melanotaenia* Gill. There is some difficulty about designation of a type species for *Rhombatractus* Gill, who introduced this generic name as a substitute for *Aristeus* Castelnau 1878, a name preoccupied in crustacean by *Aristeus* Duvernoy 1840. *A. fitzroyensis* is by subsequent selection considered to be the type species of *Aristeus* Castelnau. *A. fitzroyensis* presumably is a member of the genus which embraces *fluviatilis*, *maccullochi*, *rubrostriatus*, *carteri*, and others from Australia and New Guinea, in other words the group we used to call *Melanotaenia*. It would seem to me that *Rhombatractus* would be available for this group and is not an alternative for *Rhombosoma*. However we find an earlier generic name used in connection with the *fluviatilis* group, and this is *Nematocentris* Peters 1866 of which *splendida* Peters from Fitzroy River at Rockhampton is the type species. It seems fairly clear that this *splendida* is what has been called *rubrostriatus* from the Australian mainland, and is in fact the species you published about spawning of in Finchat, and when I first came over your horizon. It follows, that is if you can follow this procedure of reasoning that the earliest name for the so-called northern rainbow is *Nematocentris splendida*. The southern rainbow belongs to the same genus and is *N. fluviatilis*; *maccullochi*, *australis*, and *carteri* (the yellow-finned species from the Gulf drainage probably identical with *maculata* from south Dutch New Guinea) are also congeneric. These are the sort of headaches that I have to sort out every day for some fish or another.

Item No.3 Bob Wren and the Blackmast. You have dug up more of my conscience; I owe Bob a letter or two also. It is very interesting to hear that the Blackmast has wider distribution in the N.T. than formerly thought. I do not know what your knowledge of N.T. geography amounts to but mine as regards Arnhem Land needs help, and none of the maps handy to me at the moment offer much detail. The Ferguson is a tributary of the Katherine-Daly system but can't put my finger on Howard Springs, Cullen or Edith Rivers, and haven't got time to start searching the archives for better maps just now. Bob might be a bit generous in saying that the Blackmast exist in most north Australian rivers. I suspect that it will be found further to the east and west of the Katherine-Daly system judging by what I know of distribution of other Leichardtian fresh water fishes. Probably I indicated this theory in an earlier letter (that is if I posted the letter!). Apart from Worrell's original example, nobody seems to have turned any up from anywhere except Bob. Perhaps a few local aquarists in Darwin have kept them at sometime seen or caught them but nobody there would be in a position to identify them. The Stockholm Museum sent an expedition to north-west Australia in 1894-95. Under the leadership of the Norwegian Dr. Knut Dahl. This expedition collected freshwater fishes from the Victoria R. to South Alligator River. Professor Hjalmer Rendahl described quite a few new species including a *Rhombosoma trifasciata* from Mary River, this being identical with true *Melanotaenia nigrans*. (I must digress here to say that 10 years ago I met the old Prof. in his study in Stockholm, a picture I will never forget - a shrunken little man with a great mop of hair hidden behind a great desk, the sides of this and all the odd remaining furniture covered in gaudily coloured surrealistic monstrosities of art, the whole hidden in a veritable jungle of lush indoor tropical plants, amongst which, in cages and chained to branches, were impish looking monkeys and exotic gaily-coloured parrots. The climax to all being an invitation to a birthday party in the basement, all speeches in German. Anyway this expedition never got anything like a Blackmast during collecting in South Alligator, Mary, McKinley, Adelaide, Daly or Victoria Rivers. I have received fresh water fish, preserved and alive from the hinterland of Darwin but no hint of a Blackmast. The Australian Museum has a relatively good collection from Arnhem Land including South Alligator River, Rum Jungle, Yam Creek, Bakers Jungle and a host of other places; these including *Melanotaeniids*, Chanda perch, Gudgeons, etc., but no signs of Blackmast. I must chase up Bob's localities mentioned and ascertain if they are outside the Katherine-Daly watershed.

I do not get the full message about the fishes 3-4 inches long, some of blue tails and some with red. Does Bob mean that these were Blackmasts or some other sort of fish? Your melanotaenids which you sent up from the Katherine certainly had red tails - perhaps these are the red-tailed jobs that he saw. I do not know of any *Melanotaeniid* type of fish with a blue tail!

Assuming that your early shipment of Blackmasts was lost due to pH shock, it would then follow that the species has not the ability for quick adaptation from high to low pH or vice versa. It seems to me that if all the fish observed at different places by Bob were all identical with the species in question, it only means that they can tolerate, under certain circumstances a wide range of pH and hardness, which most fishes seems to be able to do up to a point so long as the change is not too sudden. Anyway in a balanced fish tank there is bound to be diurnal fluctuation in pH depending on plant photosynthesis and CO_2 -Ca balance, unless there are some potent buffering substances present. In a natural stream with abundant flowing water one could hardly expect CO_2 liberation in hours of darkness by plants to significantly affect the pH, although in ponds and dams this can be so because of excessive vegetation. If Mg and Na are dissolved out of the limestone, what about Ca? Will not Ca & Mg have greater effect on hardness, and in presence of CO_2 , tends to make pH rise on the alkaline side? Of course Na bicarbonate, and especially Na carbonate produced in such systems make the pH rise, so when we speak of excessive Na do we mean that the trouble lies with

excess sodium salts such as NaCl or resultant hard alkaline water due to Na and Co2 combination. I do not quite follow Bob's theory about the Na. In one sentence he suggests there is an upper threshold of tolerance of Na, presumably in form of NaCl; in the next sentence he speaks of friendliness of Blackmasts at Donkey Camp, where they nibble around the wader's legs. At Donkey Camp the pH is low, and he suggests (presumably) that water in this region is low in Na (and Mg), and that the Blackmast could be seeking salt from the skin. If the Na in some quantity is vital why do they choose to live in a place where it is deficient. When only 10 miles downstream at Low Level crossing there is plenty of dissolved Na, but presumably not enough to be toxic. Also if it is likely to reach a toxic level, it seems unnatural to go looking for it. Scraping the skin is not a new discovery as far as the melanotaenids go - back in 1908, the late Prof Max Weber, Dutch Zoologist, who discovered many of the New Guinea melanotaenids, observed that certain species, especially some of the Rhombosomas (= Melanotaenia, see Item 2 above) indulged in this practice. He proclaimed that it was scraping, possibly for food. Remember here that true *Melanotaenia* has better developed dentition than *Nematocentris* to the extent of much of it being external to the lips in numerous rows instead of being nearly all inside the mouth as in *Nematocentris*. Other N.G. genera such as *Centratherina* and *Chilatherina* have even greater development of external teeth, obviously a character of adaptation to scraping food. That is plant or organisms growing on plants, sticks and stone, rather than chasing mosquito wrigglers and other aquatic organisms. Also remember that *Quirichthys* has these unusual thorn-like teeth implanted externally on the lips, and could thus be well adapted as a scraper. Frankly I do not think too much about suck-the-salt theory. As far as I know all the Atherine type of fish came originally from marine environments and certain genera which we are fortunate in having indigenously in Australia and N.G. have become adapted to fresh water through time and evolution. This means that Na (and probably Mg) are not basically toxic substances, but are all important in osmotic adjustment. As a general principle salt water fish have to use salt water of their environment and would dehydrate through osmotic gradient between their body fluids and the environment if they did not have some mechanism to bring in salt water and excrete salt. Fresh water fishes which live in an environment less salty than their body fluids would swell up and bust if they did not return salt-free water back to their environment and something about retaining their salts, to the extent of recovering them from urine etc. Well that is supposed to be the theory of it anyway. Looking at the Katherine position it would seem that the species can stand reasonably wide ranges of pH and hardness (figures would be of interest!). Undoubtedly they will be more comfortable under some set of conditions and may, as many do, require them to be reached before spawning becomes possible. If they tolerate such ranges in nature then why worry until the point of acclimatization to Melbourne water, which should be OK if done gradually, and finally adjusted later to give the best response. Perhaps it would be best to ditch any added salt during transport or acclimatization in Melbourne, and to arrange holding in Katherine (Bob's tanks) and shipping in their natural water at point of collection. One pH shock in Katherine might not be too bad, but to follow with another on arrival of shipment may throw the balance. However after rambling on I must not pretend to be an expert, because in fact I am really a lousy aquarist myself.

To revert to your first letter (March 21, April 1), on subject of public aquariums. A month or more ago I had a visit from a Mr. Lee who apparently is an architectural student at (I think) Melbourne Uni. He visited the lab to get information on laboratory (marine) requirements to incorporate into your project which is to design "a public aquarium, marine laboratories, and associated facilities" or something along this tack. He had selected a site and was proceeding with his development of the scheme. I asked him whether he knew of efforts (yours and who else's I don't know) to interest government circles in a public aquarium, but he knew nothing. Perhaps your paths have crossed by now. He had been in contact with many overseas aquaria for ideas and

had much literature received from them. He would be worth a contact which you might achieve from the Architectural School at Melbourne Uni, or Monash, or where ever else he is likely to have emanated from. His project was just theory but I did wonder whether more interest is being taken in government circles and the theme of the project had been passed to his professor!! If you are one of the promoters of activities in this direction, you might be interested to investigate further whether this has got any relation to what might be going on behind the scenes visible to the public. If you can find this Mr. Lee he should have much of the information that you are looking for, and this would be an indication of the scope of material which could be expected from overseas institutions approached.

Have not bred your *Nematocentris australis* yet. Have not tried so far. Lazy you will say. Not sure now whether they are this species. Have some (3m and 1f) true *australis* from Roebourne, NW Aust. Brought over to me by a Brian Parkes. They do not match yours from the Katherine, not nearly so showy. Unfortunately the f passed on. Still have a few *nigrans* left but never get a chance to go near the city or airport on week days, and have been hesitant about shipping on a night plane.

As you will have read also in Finchat that I have joined in with the newly formed marine aquarium research group in Sydney. There is a meeting on Thursday night but I missed the last being in bed with a rotten cold. Was quite impressed with several marine exhibits at the Brookvale Show (also two excellent exhibits of indigenous fresh water fish). Also very impressed with Prof. Emmens' salt water tanks. They are a dream. Most of his fish are direct imports from Ceylon. I will probably get on to marine keeping myself as soon as I get a break from house building. Will have to extend the fish house. Would have made a start this week except for lack of space and time plus the question of funds, expenses being rather high with building rooms, and Donald's appendectomy last week. My mate has gone off to Thursday Island to wind up the station and I had made plans with him to collect Ampiprions and Demoiselles as a trial shipment, but chickened out at the last hour for reasons stated, but am now sorry that I did not make the best of this opportunity.

On the subject of TAG and research. One item I would like to see opinions gathered, perhaps as a sort of symposium of experts, is the pros and cons of subsand filtration. Have had sad experiences and acid water and rotting of plants. Could something on this subject be arranged for publication in Finchat? Possibly there is something I can add, foolish or useful as it might be. If others would be interested in contributing their respective experiences we might manage between us to sift out a few useful conclusions.

This is a nice long letter and I think that I have touched on all the items concerned. I don't write very often but seem to get wound up properly once I get going. I feel this letter is long enough to make up for the ones I haven't written lately. It is getting late so must finish.

Best regards to all,

Sincerely yours,

Ian S.R. Munro

EXTRACTS FROM A LETTER TO BOB WREN FROM RON BOWMAN

Reply to July 4 Letter from Bob Wren

July 15th 1962

... your letter read to T.A.G. of A.S of Vic ... copied part to Ian Munro who has just replied.

Plastic bags (6 large) were to be sent to you Friday 13th. You will need some cardboard cartons to protect them.

Ian Munro says that Blackmast has been missed by most scientific fish collectors - no specimens in Australian Museums, apparently also Katherine Rainbow is now in collection it seems that Katherine-Daly river areas have not been fully investigated although (Eric) Worrell traveled through and collected some Blackmast which Gilbert Whitley described. Your proposed collection may take on some importance, both from the Blackmast angle and other species.

Consensus of opinion (and mine) is that:

Cause of death of first collection of Blackmast sent to me was osmotic shock - too great a difference of mineral concentrations in Katherine water and Melbourne soft water!

Addition of salt added to the hard water may have aggravated the situation - next time send in original water as much as possible.

In Donkey Camp Blackmasts were hungry for salt; they would swim down to Low level crossing. Ian Munro suggests fishes with such external teeth normally feed by scraping for food.

You say you have seen fish 3-4 inches long, some with red tails, others with blue.

The red tails may be the Katherine rainbows - send samples to check if you wish.

The blue tails have us mystified - before we got the chance to see some.

Have you seen any of the little yellow fish with vertical black stripes you mentioned when you visited us in Melbourne?

Your idea of sending fish from different locations is interesting - we may be able to form some opinions of their tolerance of varying conditions. After you told us the pH of the place you collected was 11. We need much more information on the various water conditions in different locations and seasonal variations. (It was interesting that the Katherine Rainbows inadvertently collected and sent with the Blackmasts were not distressed by the water change in Melbourne and none were lost).....

Ron Bowman

SUNNYLAND AQUARIA
22 VIMINAL HILL CRESCENT CAMP HILL
BRISBANE QLD. AUSTRALIA

19th July 1962

Dear Ron

Just a quickie to let you know that of all the *N. rachovi* I told you about, there was the one & only male - I waited until his final eggs were due to hatch a week ago, but the procedure is good and none hatched (eggs were eaten) - the next lot due in August - I will wet portion of moss and if any pop out, I'll pop the next of the moss down to you & I'll be satisfied you will get them that way. Meantime, I'm working him to death & have plenty of bags of peat moss, which I hope are full of eggs.

So hang on a week or two old boy and I'll send some *maccullochis* with the *rachovi* eggs. Enclosed is cheque for 'finchat' adverts plus copy for next time.

Regards to everyone I know down there and behave yourselves - if possible.

Cheers,

Frank Lewis

MONASH UNIVERSITY
CLAYTON, VICTORIA, AUSTRALIA

DEPARTMENT OF ZOOLOGY
AND COMPARATIVE PHYSIOLOGY
PROFESSOR A. J. MARSHALL
24th October, 1962.

Mr. R. L. Bowman,
The Aquarium Society of Victoria,
C/- Aldwych Advertising,
450 St. Kilda Road,
Melbourne.

Dear Mr. Bowman,

I will be very happy to attend your meeting on November 7th because during the past year I have already had preliminary talks on the same subject with two Americans who have much experience and interest in marine aquaria. These are Professor Perry Gilbert, the eminent Cornell authority on sharks, and

Dr. K. Norris, of the University of California, who was the first scientific director of Marine Land, Los Angeles, and who is now consultant for the new place that is being built at San Diego.

They and I agreed that it is only a matter of time before such an institution must be founded in Australia but during our conversations it was emphasised that it was essential that the place, wherever in Australia it was situated, should get off to a good start as a place of original research and education instead of becoming merely a show-place where people could goggle at performing seals and dolphins. Gilbert suggested that the ideal place for it is Sydney, which may be true. However, I am told that, as yet, no great enthusiasm has been shown there in certain quarters because an outstanding new place would compete with the Taronga Park aquarium! Whether this is correct I don't know.

It seems to me that such an institution could quickly become one of the first-rate attractions in Melbourne, as well as a Pacific research centre that would achieve international renown. If this is what we want, I would be glad to help in every way possible. I believe too, and both Gilbert and Norris agree, that it would be relatively easy to get a considerable amount from both public and private sources for such an enterprise. Further, Marine Land at Los Angeles quickly became self-supporting and its research facilities quickly attracted a group of most talented young workers from all over the world. We could, no doubt do the same.

Yours sincerely,

(signed) Jock Marshall

TOWNSVILLE AQUARIUM CLUB

6th January 1963

Mr. R. L. Bowman
49 Chadstone Road
Chadstone SE10
MELBOURNE

Dear Ron

Firstly, here is wishing you and your family the Seasons Compliments and hope 1963 brings everything you could wish.

As usual I am late in answering your letter but T.V. and annual holidays have intervened.

We're pleased to hear that the plants, and in particular the fertilized seed pods have survived. In your previous letter you offered us 50/- for 50 odd plants which of course we will accept and look forward to hearing the result of this "test planting". Airfreight amounted to 9/-.

Club activities - we had our usual Annual Exhibit at the Townsville Show in July, a photograph and report of which will be forwarded to you shortly. All rivers have been dry for several months so we have not had any field days except for the Plants. We have several new members in the Club, but we still lack a lecturer having to rely on our own, trial and error and general discussion, which of course still teaches us - most interested in your offer to send eggs of *Cynolebias ladiges* and if you are able to send these (together with cost and expenses of same) would you also enclose a short "lecture" on what to do when they arrive.

The drought has broken so the Club will become more active now.

Happy New Year to you,

Yours sincerely

Geoff Garlick



Front Cover of the September 1960 Issue of FINCHAT

EXHIBIT AT THE TOWNSVILLE AQUARIUM SHOW by the
TOWNSVILLE AQUARIUM CLUB

The Townsville Aquarium Society has been sending us many of our native species during the past few months, and through this contact we have come to know this group quite well.

Recently they staged an exhibit at the Townsville Show, and a photo of this exhibit is featured on our cover.

Secretary Geoff Garlick tells us that Harold Martin was behind the idea. The background was painted by Frank Bruer and was 12 ft. by 8 ft. Three 36 inch x 18 inch x 18 inch aquariums formed the foreground, then behind them was a mighty 8 ft. x 8 ft. x 2.5 inch galvanised iron tray which gave the river effect back to the back drop.

In this tray were 300 Gambusia to provide life and ripples.

River bank sections each side with natural plant setting made a most interesting display, and we are sure that, short of digging up a whole river bed, they could not have done better than the excellent representation they achieved.

So good luck to you, Townsville, and we hope you like our cover.

1 Maher Street
Hurstville

16th April 1963

Dear Ron,

Just a short note to let you know that I have nearly caught up with things after Brookvale show. I expect to send the fish on Wednesday next (24th). There will be about a dozen *maccullochi* and about a half dozen *nigrans* all about 1" to 1½" long. I have to send some *maccullochi* to 'Glolite' so I will pack the two bags of fish in the one box and address it to "Glolite" and you will be able to pick it up on the way home that night without having to go to the aerodrome. If you do not like this idea let me know and I will send them separately.

I hope your wife and new baby daughter are both well.

Best wishes to all,

Bob Gray

Editor's Note:

The proprietor of "**Glolite Aquarium**" was Fred Parkes who had a strong interest in popularising native fishes.

20 Hopetoun Avenue,
MOSMAN. N.S.W.

6th August, 1963

Mr. R. L. Bowman,
49 Chadstone Road,
CHADSTONE. S.E. 10. VIC.

Dear Mr. Bowman:

Thank you for your letter of August 3rd. I hope that one or another of the contacts I gave you may prove helpful. At the moment I am not at all clear about the future of my own rather extensive fish keeping, in that I am in the process of cleaning up the fish room and am not sure when I shall start it up again. In view of this I shall not accept your kind offer to have some northern Queensland species sent to me, as I would not be in a position to house them properly.

I have much admired the Katherine Rainbow and am sorry that it has not been positively identified. If Ian Munro can't do it, I don't know who can. Is there any possibility that it is a new species? Incidentally I was most disappointed at the coverage of Australian fishes in the new book put out by Axelrod, (Exotic Tropical Fishes) in which my own name appears as an author, but purely of a section on aquarium management. I asked to see the proofs of the whole book prior to it being published, but I never got them. Had I done so I should have protested violently about a number of things, particularly the mis-identification and poor coverage of Australian species. Ian Munro is supposed to be putting out a volume of his own on Australian fishes, but tells me that he will probably not have time to do a proper job of it. I understand that even the number of plates is being arbitrarily cut down, so that not all will be figured. This seems an enormous pity, but unless some other organisation other than C.S.I.R.O. might be prepared to finance full publication I don't know what could be done.

With best regards,

Yours sincerely,

C. W. Emmens



Pictured from left: A. C. Jones (Exotic Aquariums), Prof. C. W. Emmens (Sydney University) and C. Davis (President, Aquarium Society of Victoria).

4th. December 1963

49 Chadstone Road
Chadstone SE10 VIC

Dear Ian

I won't have time to write much this time - anyway you haven't replied to my queries of last year. Replies take time though Ian and I know you have been kept flat to the boards. Now to the immediate point.

A few years ago, if I remember right, you asked me to see if any of my contacts could try for the Babinda Sunfish. I have now an offer from the Rockhampton Society President to try for this species. They want any clues you can give them on habitat and description of the fish. If you can get me anything on this in the next week, I will pass it on in the hope that some of the chaps may be able to have a look during the Xmas break.

Next: Did you see any of the fishes Frank Lewis collected? If so, were there any 'finds' and has he established them? I hope to get a letter away to Frank in the next couple of weeks, and will quiz him then. He told me in a letter August 30 that he had a couple of Rainbow species breeding. I'd like to check with you on Frank's spelling, as he is rather careless with names at times. I believe he also failed in his attempt to send Blackmasts.

Next: Did you ever reach any conclusion on Katherine Rainbow identification? You may know by now that I had David Pollard describe this fish from a rather disfigured specimen and he had hoped to discuss it with you when he was in Sydney a while ago - it so happened that you were away at the time. I haven't seen David for several weeks so don't know if he ever got around to contacting you.

Last, but most important is that we wish you and your family the best of the Season's Greetings and the coming year will be a happy and healthy one for you all.

Hope to hear from you soon, even if you only have time to send the Babinda information for the present.

Yours, in a hurry for now,

Ron Bowman

CSIRO Prawn Survey
P.M.B. Service
CAIRNS

June 25, 1965

Dear Ron,

I think your last letter in haste was dated December 1963, and I was at least a year behind then. Well things are well out of control now and I doubt if I have any correspondents left though I have a stack of letters a yard high all dating back for a year or two - still to answer. I carry them each time to Karumba in the hope of finding time to answer them, then I carry them back to Sydney and never find time there either. Today it is early afternoon and I've cleaned up everything here within the limits of convenience and must wait 'til daylight for a plane to Sydney so I will start on your letter first.

The story is that I am now a "Gulfie" and live more than half my life in the wild outback along the shores of the Gulf of Carpentaria in the official capacity of Project Leader of the joint Commonwealth and State Governments' Gulf Prawn Survey. This has been a long, weary, frustrating two years. We have tackled an immense job of prospecting for new prawn grounds and it looks now after all our efforts that there might be a commercial prawn fishery up here. You may have heard along the bush telegraph that I have thus been divorced from society generally in this capacity and see little of my home, wife and kids, and even less of my poor fish. Every time I get home I manage about one day to clean up the worst of the debris and thin out the jungles of vegetation protruding from the tanks and climbing towards the ceiling. CSIRO no longer allow me to do any work on fish taxonomy so I have become a surveyor, navigator, office boy, clerk, personnel manager, drain digger, wireless operator, draughtsman, labourer, cook and countless other things which contribute to sustaining existence in this strange wilderness of muddy water, paperwork and tropical alcoholic lethargy. But so life goes on and there is a job to do but little in the way of amusements and certainly no time for hobbies.

As a place Karumba is not too bad even if isolated from the rest of the world during the monsoonal wet for half the year. I am pretty sure that we finish up about the end of July and then I may have to shift house to Brisbane and perhaps move from there to the shores of Arnhem Land for more survey and prospecting work on prawns. My book on New Guinea fishes has been with the printer for at least a year but I have seen little of proofs and have worked like a nigger on the line blocks and colour plates during two short spells in Sydney since Xmas and hope that I will have the final proofs by next week - meaning that it should see the light of day before the end of the year. I have another spell to do up here during July and August to wind up the survey and close down the field station. There is always so much to be done in too little time and I have had to refuse two offers from publishers for copy for popular books on Australian fishes.

Even up here I do not get out of the office much and have not had time to look around any local rivers and water holes and pick up indigenous fishes for friends or myself - it would not be much point in me getting material for my own tanks as I am never home enough to look after them. I have noted however plenty of *Toxotes* and *Nematocentris carteri* - some of the latter are very fine large coloured males. Also there are some Ambassis and several of the Therapons. If you are interested in some of these I might be able to organize a shipment to you after I return from Sydney in July. Walker's Creek will be down then and I might be able to get a net into it. Air service is not too bad and I could get material through in one day from here to

Melbourne. The plane goes out from here about 7 a.m. and can connect through via DC3 to Cairns, Fokker to Townsville, Viscount to Brisbane and 727 to Sydney and Melbourne, getting there about 8 or 9 p.m. It would not be difficult getting a shipment to and away from Cairns because I know all the Ansett boys on the run but one cannot guarantee anything beyond Townsville. The only real problem would be topping up with oxygen as there is no supply in Karumba. There is oxy-welding gear belonging to the depot here but this is usually out of reach on the mother ship and its availability could not be relied upon.

To return to your letter of December 10 (1963) I am sorry I failed you about information on that little Babinda Rhadinocentrus (or whatever it is). Anyway there was no information on habitat available. Perhaps your contacts on what we call here 'the east coast' managed to get onto some. I have not seen a copy of 'finchat' for at least 18 months and am way behind with news. I think my wife forgot to renew my subscription but with 4 kids under 12 and all household problems, accounts and remnants of my fish room to care about, she really can't be expected to cope with everything. I must get financial with the Society again and hope I may be able to get back copies to fill up the gaps in my series of 'finchat.' I managed to dig up Frank Lewis on one trip through transit to Brisbane but that must be over 18 months ago.

I saw some of his N.T. rainbows that were sent to one of the Sydney dealers and he gave me some pickled ones. I have not seen any of the Sydney aquarium folk since long before I came up here and have no idea of who is still alive.

Thus life goes on and I am getting older and wearier with an ever mounting backlog of things undone. My time is never my own here or at Sydney and weekends and holidays just do not exist any more. I live and work up here in a room 9 ft square which is bedroom, office, chart room, library, storeroom and radio shack all in one and I sit in the middle on a swivel chair doing 30 things simultaneously. It is not light 'til about 7 a.m. and no power 'til about 8 a.m. Nights are not much use because we have to have yellow lights everywhere to keep the insects out of the place. It is too poor to read or write in and my eyes are no longer as young as they used to be so I have to fill in the evenings with the constant stream of visiting cabinet ministers, company directors and general miscellany which pass through this last outpost of the British Empire. As one crawls out of this room at sunset and makes for the bright lights of the Lodge bar I wonder why nobody is hauling down the flag and sounding the bugle call for the end of another day. Nevertheless it has been a grand experience up here but I think two years of it has taken a certain toll and made it quite clear to me that one can no longer pursue the little sidelines that mean so much to some of us. We have one small delight each week during the dry period and that is a bone rattling trip by road over 50 miles of ruts, salt pans and cracked scorched black plain to Normanton to get stores and mail from the Wednesday Fokker. I have seen many strange things here including staff of my own who have gone off their rocker, cyclones, aeroplane engines on fire, men in anger and men in the last stages of the horrors; in fact all the things that make novels sell.

Still I haven't made out in a straight jacket yet but somehow cannot keep up with my correspondence. So please excuse my lack of correspondence.

Anyway my best regards and tell any others who have thought me dead and gone that I am still very much alive and hope to get back amongst the little fishes again some time soon.

Yours sincerely,

Ian Munro

8280 Julie Marie Drive
West Chester, Ohio 45069
USA

July 25, 1965

Dear Ron:

Many thanks for your letter of June 8th. For one thing, it saved me from making several mistakes in an article on Australian fishes I had in preparation! Your letter was most interesting and I read it over several times.

Fred Parkes and I have plans afoot to publicize Australian fishes in the US, and this time to do it right. As a starter I have a comprehensive article which is a survey of Australian fishes, ready for press. After this, I would think that articles on individual fishes would be called for.

However, there is a very interesting situation existing in the United States regarding publications presently. As you know there are 4 commercial publications at the present:

Aquarium Journal, Tropicals, Aquarium and T.F.H. (A fifth, Aquatic Life, is more of a hobby than a publication so I do not list this). The Aquarium magazine has recently been purchased lock, stock and barrel by Aquariums, Inc., a large firm which is in the business of making aquariums, filters and allied equipment. Secondly, Tropicals has suspended publication and it is not known whether or not it will resume publication in the Fall. Finally the Aquarium Journal will cease publication as of its August issue.

There are rumours afoot that one of the other magazines remaining might buy it. So, in the space of a few weeks, the publication picture in the US changes from 4 magazines to possibly 2! Depending on the outcome of pending negotiations, where I publish this information regarding Australian fishes is a bit doubtful at present. All of this should be resolved in the next 14 days, however, and then I should be ready to go then.

So, in the meanwhile, bear with us until this rather fluid picture is resolved. Incidentally my titles of Associate Editor (Aquarium Journal) and Contributing Editor (Aquarium Magazine) are strictly honorary so I have nothing to do with these machinations. However I am greatly concerned that there will only be 2 voices in the hobby, both controlled by people producing equipment, foods, etc. for the hobby. If this occurs, there will be no truly independent thought possible without the approval of the publishers. In my own way, I am trying to do something about this.

As ever,

Your friend,

Al

(Albert J. Klee)

1 Allison Road,
Cronulla NSW
November 26, 1965

Dear Ron,

Your note to Joan came in last night and it is good to hear from you again.

I have been back from the Gulf since the end of June and will be here for some time now. The main bother is that we collected so much data up there and the result is too much to process and too many tedious and detailed reports to get together in too little time with too little help. The result is that I am bogged down pretty hard and do not get much time to breathe. The department is trying to transfer me permanently to Brisbane but I am resisting this. Having spent the best part of 2½ years away I would like to have a bit of settled home life and try and get my old fish house back into shape again.

Today I am putting in the mail a copy of a paper on New Guinea fishes. This is rather technical but it contains quite a lot of revisionary material on the Melanotaenids, explaining the changes in names and listing what species belong to which. The only descriptions of species are those that are new. I still have quite a few of my new *N. sexlineatus* from southern Papua. I have not tried to breed them but they are busy doing it themselves and fry keep turning up in new tanks every time I shift a bit of weed. I gave Bob Gray a few pairs a while ago so he could breed them but I asked not to hand them around until I had named them. Never the less I guess they are around a few aquarists' places by now. Some may have got to Melbourne. If not let me know and I will send you down a couple of pairs. They are a bit like *maccullochi*. I have lost most of my range now and it will not be easy to get replacements as most of my sources have dried up. I used to have one of the best displays of indigenous fishes but I can't claim that any more.

If you have material that needs identification I will be glad to help but I hope it is straight forward because I can't spare a great deal of time until I get the Gulf material further ahead.

Anyway we will be hearing from you so all my best regards,

Yours sincerely,

Ian Munro

P.S. My book on New Guinea fishes has been with the printer for two years or so and this should be available early in the New Year. The main hold up now is need for help to get the index finished off. It contains descriptions and figures of all the New Guinea Melanotaenids and lots of other things which I think you will find helpful.

November 28, 1965

49 Chadstone Road,

Chadstone S.E.10.

Vic.

Dear Ian,

How pleased you must be to be back home with your wife and family after your stint at the Gulf. I hope your stay-put efforts work out for you.

These two fish, one male, one female, are typical of 500 sent to Fred Parkes several weeks ago by Peter Tsang, Innisfail, I think. All Fred can find out about them is that a fisherman brings them to Peter from an island off the coast up there, they are allegedly caught in slightly acid water, soft, and that is all Peter will say.

I bought three pairs from Fred, and became first to breed the species in the Society, (big deal you know Ian). The frustrating part was however, that I could keep none of the breeders alive. After losing three, I put some seawater with some and transferred one to a harder tank. Within four days all were dead and I had the theory that these fish cannot tolerate temperatures above 80 degrees. Of the fry I found I had 1 belylslider and 15 normal fry. These were kept at the same heights in the fish house as bred, and after one warm day, I found one fry fast breathing — a sure sign that next day he'll be dead. Sure 'nuff that morning, I transferred all the fry + water into a low level tank, have not lost any since. The fish are variable in colour. Some were all red others all blue and many blue with red fins. I suspect that this is a very colour variable species as are the Siamese fighters. My two pairs that bred were red x blue f. and blue x blue. Fred shipped most of his to U.S.A. where all but two promptly died. He is busy breeding from the residue in the hope of sending replacements. Meanwhile we need to know the name if you can pin-point it. Peter thought they were a *Rhadinocentrus* species.*

I got 6 *M. sexlineatus* from Bob Gray and am growing fry from these. Should be able to get them established here.**

You may not know that Peter sent a fine shipment of *Pseudomugil gertrudae* to Fred this year, onto which I promptly pounced. Have about a dozen young from these three-quarter grown and collect fry at the surface of tank so will gradually build up a collection. They are a really beautiful species. I remember you telling me about them about 1961.

Perhaps the Babinda sunfish will turn up soon eh?

Albert J. Klee (U.S.A.) is Editor of a new hobby magazine there and is relying on Fred and I to steer him right on some of the breeding references on Australian species. He is after confirmation of *Nematocentris* v *Melanotaenia* and Fred has sent him your address. He is a fanatic on accuracy with his work on nomenclature, translates from several languages, and has assimilated a great fund of know-how on the various facets of fishkeeping. He seems to be the great white hope for the hobby in U.S.A., loathes Axelrod who now rules a vast commercial chain of pet publications and stores and has

recently taken over the Aquarium Journal with which Klee was associated. Al Klee is likely to prove a most interesting aid to the describing and publishing of fishes from this country. He has seen the two surviving *Rhadinocentrus* specimens and was most impressed. A copy of your 'Additions to the Fish Fauna of New Guinea' would probably be of great assistance to him, but no doubt you will be hearing from him shortly. Many thanks for same Ian, I have not had much time to study it fully, but have seen enough to excite my curiosity (always a dangerous thing for my peace of mind). It will be invaluable reference for me in my quest for info on this area.

I am looking forward to seeing your New Guinea book.

By the way, our Melbourne Oceanarium and Research Foundation is progressing steadily. The papers got wind of it (Sun on 25th, Herald on 27th.) and gave it some quite interesting mention. Our application for site is at the Lands Department and is going well. We have to wait on Act of Parliament to reserve the land for our purpose. Have you the address of Jean Garnaud - I'd like to check whether he can assist with his 'perfect public aquarium' ideas.

Cheers for now Ian,

Your old friend,

Ron

* Later identification confirmed as morphs of *Rhadinocentrus ornatus*.

** These were found to be *Melanotaenia papuae* when the real *M. sexlineatus* species was collected some years later.

R.B.

The birth and death of:

The MELBOURNE OCEANARIUM and RESEARCH FOUNDATION

Ron Bowman convened a meeting of interested parties on 1/11/62 to discuss ways and means of establishing a public aquarium and aquatic research centre in Melbourne.

Among those attending were:

Professor A J. Marshall, Head of Zoology Dept., Monash University. Dean of Science Faculty.

Sir Robert Blackwood, Chairman, Dunlop Australia.

John McNally, Director of the National Museum.

A.D. Butcher, Director Victorian Fisheries and Wildlife.

Dan Lynch, Victorian Fisheries and Wildlife.

Hope McPherson, Conchologist, National Museum.

Brigadier F.O. Chilton.

Ron Bowman, Aquarium Society of Victoria.

Daryl Maddock, A.S. of V.

The meeting agreed on the name of the Foundation, its aims and objectives and discussed the methodology of tackling the project.

During the next 3 years the committee investigated possible sites along the eastern foreshore of Port Phillip Bay with emphasis placed on water quality, convenience of access to researchers from Universities and best access to the general public. Aerial photographs supplied from Ports and Harbours surveys reinforced the view of the experts on the committee that Rickett's Point was by far the most suitable site.

Two designs for a brochure on the Oceanarium proposal were produced by Ron and his designer friend, Bob Salveson.

Ian Munro had alerted Ron to the presence at Melbourne University of a final year architectural student who was researching for his Degree project the concept of a public aquarium theoretically sited on Red Bluff near Sandringham. This student from Singapore, Yee Mah Lee, was happy to allow his images to be used by the committee for discussion and display purposes.

Ron met with Dr. Philip Law, the Antarctic and Oceanography explorer and researcher. Dr. Law had received media publicity on a proposal he had made that part of Point Nepean could be reserved for a research establishment to study the marine life of Bass Strait. Dr. Law expressed interest in the concept of the two possible projects cooperating with benefits to each from funding, administration, livestock and live food exchange.

Jock Marshall was confident that his contacts with the Ford Foundation and Rockefeller Foundation U.S.A. would provide a springboard for fundraising and indeed Jock was the key member of the group with his enthusiasm, passion for the project and his rock-solid contacts in the scientific community across the world.

Ron met with the Honourable Don Chipp, the Federal Member for Higginbotham, who expressed interest in the project and offered to assist where appropriate and asked to be kept informed of progress from time to time.

Approval in principle for the project was received from the Sandringham Council.

A public meeting was organised at the Beaumaris Community Centre on July 4, 1966 in order to inform the local residents of the scope of the project and answer any questions.

Jock Marshall, diagnosed with cancer, had been admitted into hospital in the last week of June and so the Melbourne Oceanarium and Research Foundation was represented by Brigadier F.O. Chilton, Mr. R.L. Bowman and Mr. J. McNally (Director of the National Museum).

Brigadier Chilton outlined the origins and composition of the Foundation, and the reasons for the selection of the Rickett's Point site.

Mr. Bowman used projected illustrations to describe the functions and proposed location of the Oceanarium.

Mr. McNally gave details of scientific groups interested in the project, and enlarged on factors influencing the choice of the site.

All speakers emphasised the research aspects of the project, pointing out that there was no opportunity in Australia at that time for intensive study of marine life.

The local residents then had their say, and it immediately became apparent that intense anti-Oceanarium lobbying had preceded the meeting and that the Foundation representatives' presentations had fallen on deaf ears. Only 4 of the 154 locals present voted to support the Foundation and the three enthusiastic presenters were shocked by the rage and parochial bias demonstrated against them.

Only one resident was brave enough to express support for their endeavour ... he said that, "although there were some grounds for criticising the project, many of the objections expressed at the meeting were parochial and irrelevant, that the objectors appeared to think that Rickett's Point belonged to the people of Beaumaris when in fact it belonged to the people of the whole of the City of Melbourne".

It was a welcome but small ray of unbiased thinking in an otherwise dark evening.

The Melbourne Oceanarium and Research Foundation project was blown out of the water ... they went to that meeting enthusiastic, optimistic and naïve. They suffered a rowdy ambush by the locals and left, shell-shocked and painfully aware of the violent opposition of the local community.

The following week, Jock died ... there was no point in battling on without him ... it was then all over.

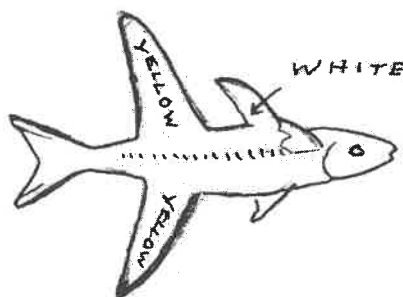
Love Lane

Townsville

Dear Ron,

I have managed to catch a few fish which appear to be a new variety of Blue-eye. Their body shape and finnage is similar to the Townsville Blue-eye; however their colours are far more striking.

Unfortunately the creek where I found them is over 300 miles from here and they were in very small numbers; here is a sketch of the male. (fins extended when chasing female).



All fins edged with black and white.

I have about half a dozen which I would like to send you if you can advise how and when to send them.

The males are not quite full grown and the females are mature but empty, they fill up to resemble a female guppy when in spawning condition.

I found them in a small water hole with a temperature of 70°F at the bottom and 75°F near the surface; pH was 6.5 and hardness 70 p.p.m.

Although I looked for about half a mile up and down stream they were only in the one hole, even though small connecting streams would have allowed their passing into the other holes. No other fish were present in any of the places I searched. They will eat heart and brine shrimp and I guess would soon learn to take dried foods.

I have sent the only adult pair I collected to Professor Emmens at the Sydney University in case they are not as yet classified.

Regards

Ray Leggett

1 Allison Road
Cronulla

8 December, 1965

Dear Ron,

Thanks for your letter and for the two specimens of Melanotaeniid fish. I think you have come to the end of your quest for the mysterious Babinda sunfish. I think that this must be it. I have looked at the male and female this morning under the microscope and am quite sure that these are of the genus *Rhadinocentrus*. I dug out the original description and figure of *Rhadinocentrus rhombosomoides* Nicholas and Raven 1928 and note that the specimen which they drew is a female judging by the finnage. Their description is not as detailed as it might be. The body proportions seem about right but the anal fin counts of your two are a bit higher than in the type specimen but seem within normal sort of range for this family. The body scales also seem rather different but probably also within a reasonable range. One of the main features about *rhombosomoides* is the presence of teeth outside the lips and for this reason I have wondered whether it was strictly a *Rhadinocentrus*. Your specimens do not show the teeth very well-developed but there are indications that they do extend outside the lips, but otherwise look more or less normal for *Nematocentris*. I have checked back on series of *R. ornatus* but these do not have the teeth outside the lips and tend to have smaller mouths anyway. Your two examples are smaller than the type and thus the teeth might not show as well as in the old hoary ones. There are a few paratypes of this species at the Australian Museum and I have seen these several years ago but I would like to look at them again to check up on the teeth and other details. I do not get into the city very often so it may be some time before I can do this check.

If I am correct about my identification we can now record that there is sexual dimorphism as regards colour. I do not think the pattern between males and females in *R. ornatus* differ much. Also I have looked again at some old preserved specimens of a *Rhadinocentrus* from Fraser Island and these differ by having less striking colour pattern than *ornatus* from Moreton Island and localities on the mainland around Brisbane. They are rather dusky in both sexes. I have kept live ones from Fraser Island years ago but cannot remember much about them now. The main character of the genus *Rhadinocentrus* is the lack of pungent spines in the fins. There may be a complex of several species on the Queensland eastern seaboard and I will look into this some day when opportunity permits.

That your specimens came from an island off Innisfail supports my theory that these are *R. rhombosomoides*. However I would like to see some bigger ones to compare with the paratypes. Also I am interested in your notes on the "reds" and "blues" and would like to see some live ones and study the reason for these colour types, i.e. if it is tied up with degree of development of pigmentation.

Must get on with some work now so best of regards

Yours sincerely,

Ian S.R. Munro

CSIRO
DIVISION OF FISHERIES AND OCEANOGRAPHY

P.O. BOX 21 CRONULLA NSW 2230
TELEPHONE 523 6222
TELEGRAMS CORESEARCH CRONULLA TELEX 24875

Mr R.L. Bowman,
49 Chadstone Road,
CHADSTONE VIC. 3148

24 March, 1976

Dear Ron,

It seems that our last contact was as long ago as July 1967 so I hope this finds you in good health and still active in aquarium circles. The reason for this letter is that a Dr Jurgen Clasen of Heide, northern Germany will be visiting Australia later this year. Apparently he is a water engineer/chemist and is a keen aquarist with particular interests in Melanotaeniidae and related atherinid fishes. He plans to travel with his wife on a private visit and plans to spend some time in Sydney with a counterpart from the Water Board to look at dams and laboratories. He then wants to go north and do some collecting and checking of water qualities. He hopes to take some fishes back to Germany as a nucleus for breeding. He particularly mentions the environs of Cairns and Darwin.

It occurs to me that he might have a far more productive visit if he had some contacts with interests in aquariology and especially native species. I am out of contact with virtually everybody except government people and these will probably feel disinterested in a private visitor. I am wondering if you and/or other society members still follow your former interests in indigenous species and have contacts or correspondents with similar interests in Queensland or the Territory. If you can provide any suggestions I am sure he would be grateful for any help they can provide in guiding and perhaps transporting to local collecting places.

Judging from his correspondence he has a good command of the English language and there should be no difficulties with communication. You probably have access to the German language periodical "Aquarien Magazin". He has just sent me a reprint of his article on Rainbowfishes in Vol. 3 (March 1976): 92-100. This features some fine colour photos of various Australian and New Guinea species. The most spectacular is *Glossolepis incisus* from Lake Sentani. Most of the others I have kept. Fig. 2 *N. sexlineatus* is my species.

Fig. 5 looks like *N. rubrostriatus* which I brought into Australia from the Torres Strait islands and I think some of my stock got into a Chinese breeder's hands and this one might even be a descendant. Some time ago Dr Clasen alerted me to a new species *Iriatherina werneri* from Merauke ("Das Aquarium", vol.55 (Jan 1974). This has a resemblance to *Telmatherina ladagesi*, has most spectacular finnage in males and is now being bred in Germany.

Personally I have not been very active as an aquarist. A few years ago I sold my house to a bulldozer and of course lost my fish house and glass house. I still have all the equipment which I am gradually installing between cars and workshop equipment in the lower floor garage. It lacks the insulation and natural lighting which I originally provided and my aquatic jungles and stocks will have to be re-established.

With best regards,

Yours sincerely,

(Ian S.R. Munro)

Principal Research Scientist

CSIRO
DIVISION OF FISHERIES AND OCEANOGRAPHY

P.O. BOX 21 CRONULLA NSW 2230
TELEPHONE 523 6222
TELEGRAMS CORESEARCH CRONULLA TELEX 24875

YOUR REF.

IN REPLY PLEASE QUOTE AM18/100

Mr. R.L. Bowman
49 Chadstone Road
Chadstone VIC. 3148

2 June 1976

Dear Ron,

Many thanks for your letter of April 17 concerning Dr Jurgen Clasen's visit here in September-October this year. I wrote to him today and passed on your suggestion that they visit Melbourne and see all the wonderful things in the tanks of Victorian enthusiasts. I gave him your address so he may write directly to you. I do not know details of his intention to start in the north (Queensland??) and gradually work south to Brisbane and thence on to Sydney en route home. He may be able to include Melbourne as he plans to be in Australia for six weeks: much may depend on how far his DM will stretch and what fare concession deal he has taken up.

Also I gave him the address for Peter Tsang and told him about Heinz Staude.

Your range of Melanotaeniid species seems to have increased so perhaps you could be bothered filling in a few details for me on some of them. *N. sexlineatus* was brought in by me from the Laloki R., Papua as was also *M. goldiei*. Also it has gone to Germany from South West Irian (fide Clasen's article in March 1976 *Aquarien Magazin*). Did yours come from my original breeders or more recently imported stocks from New Guinea? Also did your *M. goldiei* come from New Guinea? I have seen preserved materials from Weipa, Qld. Where did your *ogilbyi* come from - perhaps also South West Irian? There is one very similar but presumably a new species from the Kimberley W.A. Are your *rubrostriatus* from New Guinea or a Hong Kong breeder, or ex my original breeder from Mulgrave (Badu) Island, Torres Strait? I do not know (as such) your "magnificent rainbow from Goyder River, N.T.". Could I have a body (or more) please? The Gin Gin R. species is probably the one that Gher. Schmida (padstow) recently showed me. Also I do not know about your 'N. tsangi' unless it is the north Queensland one which Ray Sperring gave me and which he wanted me to name "Sperringi" after himself. The Katherine River rainbow remains un-named. *M. nigrans* proper has now found its way to Germany.

In passing I might mention that I got two different shipments of *Quirichthys stramineus* from Katherine some years ago. One came D.O.A. and the second batch did not make more than a day or two. The N.T. fisheries people say it was living happily in their tanks in Darwin. It has now been found in the headwaters of the Gregory R. as well as the Katherine R. I spent a weekend in Katherine several years ago but was unable to go fishing.

The latest is a lacustine species from Fraser Island with very prominent black streaks and speckles and extremely blunt teeth which do not seem to conform with either *Nematocentris* or *Melanotaenia*. I have seen no live ones as yet. Amongst other odds and ends that have come in here is a small banded species from one of the North Queensland crater lakes and which seems to have some affinities with *maccullochi*.

I was interested in your comments on *N. fluviatilis*. By "both east and west of range varieties", do you mean these from the coastal belt of south Queensland-north N.S.W. and the Murray-Darling River system, respectively? If so how do you distinguish them? Currently I am preparing a section on this family for a book being prepared on freshwater fishes of S.E. Australia (NSW State Fisheries & Australian Museum) and have been looking at the variation and geographical range of this species. The type of *N. fluviatilis* are from the Murrumbidgee R. (and Ropes Creek = Mulgoa, Hawksbury R.) thus including both coastal and inland kinds. The Murray-Darling form was redescribed as *N. neglecta* with types from Cudgegong River, Rylestone (upper head waters of Macquarie near Mudgee) with other material from Colombo Creek near Narrandera. I note that the Goulburn River (Victoria) is a tributary of the Murray and your form from there should logically (if there is any logic in speciation and distribution of this family) be the same. I have specimens on loan which I will look at today from Albury and Tocumwal, but I doubt if I will be able to distinguish them from others scattered throughout the whole Murray-Darling basin. Currently I am examining a wide range of material from coastal and Murray-Darling systems in the hope of being able to find some constant characters which might distinguish the two forms. So far the differences found are so slight that they are not convincing. Consequently any pointers from aquarists' angle would be greatly appreciated.

I am unable here to fill in all the blanks of happenings on the professional and domestic fronts since our last contacts. I am sorry to hear of your wife's health problem and your niggly aches. We have not fared the best at this end either. In January this year my wife survived a diabetic coma following a regular operation (there is no known family history) but is doing fine now thanks to insulin and modern medical approach. My share was a coronary in 1968 and a few nasty frights since, constant control of hypertension, partial deafness and periodic immobilization with arthritic inflammations. Like you we survive and keep more than busy. My home sale to a bulldozer come high-rise development in Cronulla took me back to square one in some things - changing somebody else's house and garden to one's preferences in décor, standard and facilities. My family has grown up, two having attained their majority and the third steaming that way with the last still in high school. Donald passed his finals in the Solicitors Admission Board and is about to complete Articles. Margaret completed her general nursing certificate with a high distinction. Lindsay reneged on higher studies and settled for being a clerk with Main Roads. Currently all are living at home making the household six people, three cats and five motor cars. As you can see there is not too much time these days for fish keeping but I have some tanks back in operation but unfortunately no indigenous species other than a few dull blind-looking carp gudgeons.

As an aquarist this item may be of interest re longevity. Seventeen years ago the late Harry Martin who had an aquarium business in Campsie gave me a dozen dull-looking drab gudgeon of Javanese origin imported as "Rainbow Prigi". He could not sell them. I was never kind to them and they mostly lived in dirty tanks on the floor with no heating during winter. When my stocks got down some years ago I shifted them into a well-balanced tank and discovered they were better than I thought - the males going jet black with canary-yellow fins at night. One still survives and is still very active although a bit bent and pot-bellied. In my earlier days I kept meticulous records of acquisitions so I can verify this age. It is a *Hypseleotris*, possibly *guentheri*.

On the work scene I have spent a good slice of my life on the Gulf Prawn Survey and working up data collected. The survey has become a legend and the industry a multi-million dollar concern. In the last few years I have largely returned to fish taxonomy and am proceeding towards the completion of the Handbook of Australian Fishes. Currently I have an American ichthyologist working with me on this project.

I went back to the Gulf for a few weeks during 1971 and again in 1972. During these visits I was able to do some collecting in the fresh waters of Normanton environs. Summer working conditions were rather arduous and as there were no support facilities to receive shipments I made no attempt to bring back live stock. We got lots of species including the inevitable bony bream, catfishes, rainbow (*carteri*), three species of perchlets, therapons, gudgeons and gobies and a few little freshwater sole. I am getting itchy feet to wander Australia again but will probably use vacation time or long-service leave to do this. Strange as it may seem my last two vacation tours into north Queensland were with my sons to catch butterflies. Also in the last year or two I have taken a fancy to keeping cacti. By the time you get another letter from me I will probably have developed other peculiarities.

Best regards to all,

Yours sincerely,

(Ian S.R. Munro)

Principal Research Scientist

Dr. Jurgen Clasen 11.8.1976
Heidestr. 20
5204 Lohmar 1 - Heide
West Germany

Dear Mr. Bowman,
Recently I received a letter from Mr. Munro, in which he mentioned your extensive collection of indigenous fishes. Mr. Munro recommended to look at your aquaria during my journey to Australia, which I will make in September and October of this year. Since I am very much interested in Australia fish species, especially in Rainbows, I would be very glad if you could allow me to see your collection. I intend to stay in Melbourne from 1st September (noon) to 3rd September (early morning). Please let me know, whether you have time of half an hour or so for me during these 1.5 days and what time of day would be most convenient for you.

Sincerely yours,

J. Clasen

Heide, 18.9.76

Dear Mr. Bowman,

Many thanks for your kind letter which arrived yesterday. Since your letter came here very fast, I hope you will get my reply in time.

I will come to Sydney with M.A.S., flight MH 893, accompanied by my wife. From there we will take the circle flight Leichhardt of TAA. The first flight of this tour will be 417 leaving Sydney at 12.00 and arriving in Melbourne at 1.10. We intend to leave Melbourne on Friday morning in order to go to Adelaide, where I intend to see a colleague. In Melbourne I not only intend to see you, but also two gentlemen living near or at Heidelberg. I have however not received message whether one of them or both are free during the time we are staying in Melbourne. Concerning my stay in Melbourne it is my primary aim to see your and Mr. Staude's fishes, but if there is time enough we (especially my wife) would be glad to make a trip to the Sanctuary near Healesville.

We are very glad that you intend to meet us at the airport, and I think we could then speak about further details.

Please excuse my bad handwriting.

Sincerely yours,

J. Clasen

R.B. will always remember this whirlwind day during which Jurgen and his wife, Cilli saw his fishes, Heinz's fishes and had a picnic lunch at Correnderk Reserve, Badger Creek, Healesville, walked them through the adjacent rainforest on the southern slopes of Mt. Riddle where they were fascinated by the fungi, lichens, birds and tree ferns in this pristine habitat, then down the road to the Sanctuary where they amazed Ron with their knowledge of all the Australian birds ... (so excited when the Kookaburra laughed they forgot to turn their tape recorder on) ... and animals and finally, after dropping them off at their motel, he made it in time to conduct his evening tutorial by 6 p.m. at Prahran T.A.F.E.

CSIRO
DIVISION OF FISHERIES AND OCEANOGRAPHY

P.O. BOX 21 CRONULLA NSW 2230
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October 27. 1976

Dear Ron,

There have been two letters from you amongst my great pile of unanswered mail which I am gradually clearing. I think I will keep you off the official files and pay my own postage but I will compromise by using the firm's paper. Things have been pretty busy this end, even on the domestic front with more than average roll up of old faces appearing out of the limbo and my elder son deciding that he would engage a bride to be (next March).

Jurgen Clasen and his wife have come and gone but we did not see much of them. Joan and I met them at the airport but a German-born aquarist acquaintance also came and through his monopolizing of their time and not attending to first things first they did not get their Melbourne connection. It was an extremely foul wet day and my old car played up (I used the old EH Holden SS as it had more space than the Corolla but no demister or other modern aids to driving in mid-city peak-lunch hour scramble in the blinding rain). I thought he was going to ring you from the Sydney terminal to advise of his delay. I had had everything by the time we got back home so abandoned the day. I am so sorry about my failure to be contacted. I do not always keep strict business hours as I can manage life better and get more done other ways.

You and the others seem to have given them a good run around in the Melbourne venue. I passed on your message to Jurgen about the missing bird book but it appears that it was all a misunderstanding and that motel cleaners are not interested in bird books after all. You are indeed lucky to have an unclaimed letter returned from Darwin. Most of my correspondence between there and here does not reach its destination.

Your second letter with enclosure for Jurgen did not arrive until the day after they visited us. After a very successful trip in N.T. for which I laid a path of contacts, they moved to Cairns and stopped off again at Townsville, Rockhampton and Brisbane. They turned up in Sydney at the beginning of this month but were immediately whisked off in the unknown by Gher. Schmida who took them on a mile-consuming car trip to the back of Bourke to look at monitors and shingle-back lizards thence across the top of the state and down the coast where I think they saw some *N. fluviatilis* and some *Rhadinocentrus*. Their host apparently drove endlessly day and night and they slept under the stars. They seem to be rather confused. Little time was left and they managed to squeeze dinner and a few hours with us at home two nights before departure to Germany. The night before departure I was supposed to go to Schmida's place to see the slides and live shipments but Donald's announcement of engagement that day scotched that. I will forward your note to Jurgen when I next write. He is probably too exhausted to even read now.

He sent me pickled rainbows from N.T., having fished from west of Darwin east to the Wildman River and did an overland trip to Katherine. He got for me *M.nigrans*, *N.maculata* in numerous shapes, sizes and pattern. *N. australis* with red, orange and yellow tails. At Gove they fished several places and brought back from the Giddy River a large number of what he says is the Goyder River rainbow. This I had heard of from you and others but not yet seen. The material was of much interest as it covered a wide area, was new and colours were still showing very well in much of it. I got busy with my box of water colours and made a number of sketches of the larger and more colourful ones. We also took colour photos and am waiting return of these shots. Out of this some facts seem to be beginning to emerge. I will turn the page before the surprises.

For sometime now I have been wondering which species reside in the general area around Darwin. I have seen lots of pickled things and have wondered about black parallel lines on the flanks of some and not others. Long ago I discarded other people's opinions that some are identifiable with *rubrostriatus* and decided that they had misidentified *maculata* (*carteri*). The plainer fins on some and the said black stripes made me think of *australis* and I have been inclined to the view the ones you got from Katherine Road Crossing years ago were really only a version of *australis*. As I said Jurgen's *maculata* come in various shapes and patterns some showing deep pink and yellow chequers on their fins. Most have parallel yellow stripes. Some only have development of the blackish tail checks. The interesting thing is that in some the yellow stripes on the lower hind flanks become variously overlaid and obscured with melanophores. If a good job is made where these become very black and the fins less colourful or less chequered then we have *australis*. If we have bright red tail we have your Katherine rainbow. Also we seem to have orange tails and plain yellow tails. In earlier correspondence this year I told you that *fluviatilis* lives way west of the Darling to fish which have characteristic *maculata* patterns. The other day I borrowed the type specimen of *solata* Taylor 1964 (American-Australian Expedition to Arnhem Land Repts.) which is from Groote Eylandt. It was so named in allusion to sunburnt from its bright yellow tail and golden stripes. It (figured pl.21) like the one above it are variants of *maculata*. Jurgen got some very large ones from Wildman River and these feature vertical dark bars on the thorax much like in his fig.9 of *Chilatherina sentaniensis* (Aquarium mag. March (3) 1976). Now I am going quite potty or is it that there is but a single *Nematocentris* west of the Dividing (except for the Murray-Darling *fluviatilis*)? Yes plenty of local colour variants as noted above. I have some of the specimens on which the Australian record of *ogilbyi* from Kalumburu, WA is based. I concede that these are likely to be heavily melanistic *australis*. So back to the drawing board and look at much more material before publishing.

Next shock. The Goyder River rainbow. I presume that Jurgen is right about the big batch from Giddy River near Gove. These are *Melanotaenia* and they match beautifully with a water colour drawing I made in 1958 of a specimen from Weipa. I never really knew what species this was but tentatively thought it would be *goldiei* which it probably is not. I never had live ones then and later during my stints on the salt pans of the southern Gulf never saw it there.

My other shock now is Fraser Island. I told you of extremely melanistic specimens growing to large size with very worn-down teeth from the dune lakes. I got some live ones and they are ordinary coastal *fluviatilis*, dead-ringer for John Lake's Fig.43 from the Mary R. They show good bright reds. They are in a virtually bare tank in a dark corner and get quite dusky looking in poor light but bleach when I turn on the tank lights. I would never have matched them with the pickled ones.

The position now with me is that I am well enough set-up with tanks to handle live material so please tell Heinz Staude that I can cope. I have a three tier bank about 18 feet long, that is about 12 tanks 18" x 10" x 8", about 8 tanks 24" x 15" x 12" and 7 tanks 30" x 18" x 14" equipped with heaters and fluoro lights. Also there is another bank of about 10 tanks of the 18" types that can be pressed into action fairly quickly. A percentage need cleaning out after standing unused for about three years. I have too many small tanks but certainly they are OK for smaller species. One small temporary hitch. Joan and I are hoping to go off for a couple of weeks maybe from mid-next-week so I do not want to receive anything until we get home again. Then I would be ready for the problems and I would certainly like to obtain samples of Heinz's range of species. I will be in southern Queensland during my leave and may try to collect a few fishes from that area.

Thanks also for sending the colour prints. The Goyder River sp. *X goldiei* cross looks much like the wild ones from Giddy R. and Weipa but lacks the vivid oranges in the unpaired fins, particularly the caudal. If Heinz is going to send examples of this (Goyder R. proper or strain from this cross by Peter Tsang) will have more to say later. The *nigrans* from Darwin is the species I associate with Gunther's original description and specimens. The red on the lower tail half is interesting but is reminiscent of the yellow- orange-vermillion-carmine variations that I am beginning to see from different localities. I do not know about the Bremer R. *Craterocephalus* - most species in this aspect look rather similar. If it is really a *Craterocephalus* (having correct mouth parts and gill raker counts) it ought to be either the coastal version of *fluviatilis* or *marjoriae* neither of which have rows of spots. I have a few of the last named from the Mary River but they are much heftier in the body. It is possible that I might be visiting at the Queensland Museum when in Brisbane so I will see if they have anything like yours from the area. To be sure I will have to wait the demise of one or so of your specimens and check the body.

Before leaving rainbows I was pleased to note that your *sexlineatus* and *rubrostriatus* came from my original stock. I had one *sexlineatus* left when I moved house a few years ago but like all its mates and my stock of *rubrostriatus* are gone but not forgotten. Perhaps I have hope of regaining a few individuals! Also I am not surprised to learn that "Tsangi" and "Sperringi" are the same. This species and Goyder River ones do not have names as far as I can tell. (There are lot of old names from Northern Australia which might refer to these or anything else - probably one will never find out). Jurgen's material from Queensland was not very inspiring. Most of what he sent me were small and drab and I have tentatively dumped them in *splendida*. Apparently he did not pick up "Tsangi" or *maccullochi* in the Cairns area. I organized him government servants who had hauling nets and other gear in N.T. but he had only his own resources and a hand net in Queensland.

Now for Blue-eyes. I knew about the *P. gertrudae* from West Irian. I have a few of the collectors' corpses. It was described originally from Aru Island (Weber 1911), then from Cairns (Munro 1958) and later from N.T. (Taylor 1964). I included it in my N.G. book on probability and this has now been confirmed. Am interested to hear of the "Townsville" Blue-eye which you think could be *Iriatherina*. This of course could be possible. One of the Papua-N.G. fisheries boys found it on the Papuan side of the border much about the same time as the Germans got it in the Merauke district of West Irian. He sent me notes for comment but was cagey about letting me see a specimen as he perhaps imagined I might beat him to print. By the time the specimen reached me

I had the German description and some examples from the type locality. The same person claims to have a new Blue-eye from the same area but again he does not want me to see it. I have been offered an opportunity to examine the fishes collected by Hamar Midgely in the Alligator River systems and also material collected by Ross Pingelly of N.T. Wildlife Section. There may be Blue-eye specimens amongst these. I never saw Blue-eyes in the Gulf although I worked in brackish water and upstream in a number of the rivers in the S.E. corner.

A year or two ago Jurgen was enquiring of me about Blue-eyes domesticated in Germany and the possible origin of the strains commonly kept there. This of course could not be answered as lots of fishes from lots of places have been shipped around by lots of people and aquarists in general (present company excepted) do not say much even if their memories are accurate or place of capture important. At the time of his enquiry I was prompted to look through the material here to check out some supposed characters but found lots of variations. This made me wonder whether all my *signifer* represented a homogeneous species. The Townsville ones I have always been able to separate by the double dotted line along the sides. Northern and southern species were amongst Jurgen's Queensland collections retaining colour and I made a couple of sketches.

Your honey Blue-eye is a new one on me (or again perhaps it is not). I gather from Jurgen who had been talking to Peter Tsang that these originally came from just north of Brisbane (Caboolture district, Glass House Mts, or thereabouts). This makes me wonder about a few bodies I received years ago from the Buderim Mt. area (also close by) taken by Frank Boyes - he picked them as distinct and considered them "green eyes" rather than Blue-eyes. So far I have seen none from the Mary River or Stradbroke Island although I have collected in both areas years ago. You quote *tenuis* but checking back in an earlier letter you said *tenellus* for the Honey blue eye. This is a valid name for a species described by Taylor 1964 from Oenpelli, N.T. The holotype is in the Australian Museum and as figured by him (pl.22) is a drab female. I imagine the honey may be misidentified; and if from the district mentioned, could well be at home in soft acid water as there is (? was, because developers have destroyed much) vast areas of paperbark swamps there. I have often collected Blue-eyes (*signifer*) in very salty water. The variety of *signifer* which Whitley named *affinis* came from around mangrove roots at Low Isles (off Port Douglas).

Obviously there is need for some very detailed investigations and it is interesting to speculate on what the outcome on distribution and speciation will be for these two families. It must seem rather odd to you that I have made so little ground on the subject despite the number of years that have passed. Of course to do a good job one would have to have lots of time, finance and opportunity to collect personally over the length and breadth of the continent. There is a great amount of illustration to execute and one great mass of counting, measuring, calculating and graphing. All would need support from tank work, varying conditions, cross-breeding and almost certainly help from protein chemists. This is a far call from what can be done by a small-time museum curator sitting amongst a pile of books and bottles. Even to have enough leisurely time a few hundred jars of bleached pickled bodies in spirit are not especially enlightening - in fact most frustrating when one sees the wide overlap and variation in counts and proportional measurements. Admittedly I have an excuse in that these families are merely sideline hobby work with an hour or two now and again to think about. Also there is the Australian handbook to finish and all the Gulf prawn survey results still to get out. Perhaps the solution is to retire and walk out on the lot.

As I am now steaming up towards 60 I am beginning to be tempted. Having accrued credit for furlough for 33 years at the rate of 6 months per 20 years service (Gough wanted to bring it up to 8 months) plus about 2 months recreation leave I don't reckon on having to work more than another year or so. Admittedly it is tempting to think of the wide open spaces, a camper van and a fishing net at 60 and doing

something one always wanted. However salary is worth much more than the pension that one has been contributing to heavily for years, so I suppose I will continue to front up for another five years, doze in the afternoon and prune the roses in the weekend. I am so much part of the scenery now that nobody notices me anymore – even if I did help to put the Division in focus by my Gulf survey being one of the major achievements of the organization in 50 years. Did you happen to see a copy of the CSIRO Jubilee booklet "Surprise and Enterprise". It is a must if you happen to be an admirer of Robert Ingpen graphics!

From this you may gather that I am also an oldie put on the shelf but oddly enough the bosses still want me to produce and produce and make their publication lists look good. I much sympathize with you over your current frustrations. Of course I cannot open my mouth about import bans and noxious fishes. There was a time when I would have been called in on the advisory panels but these days expertise is proliferating like magic and about as deceptive. Knowing many of the people now pushing such matters in the governments I am very much aware of levels of technical background (or lack of it) and the power of bureaucracy. The fish importers here are pretty hot under the collar about the action to ban goldfish and limit the number of tropical species. In the second instance the reason stems from inadequacy of government officials (including biologists & ichthyologists) to cope with learning to recognize more than a few dozen commoner species. I believe that the Victorian Government never really managed to eradicate carp and I doubt if any government will really beat smuggling of some goodies.

I think I said in an earlier letter that publishers are always chasing me to provide copy for fish identification books. Apart from that funny problem of being short of time, an obstacle is the lack of illustrations. Personally I am bored with the old classics that I have been forced to use; also I am bored with scuba divers' underwater shots. George Coates, who did most of the colour piccies for Tom Marshall's book on Barrier Reef fishes, told me the other day he is gone 81 and is still going out on boats and painting fishes. It occurs to me that with your artistic skills, idle fingers and frustrations. What about colour drawings of fishes as a new part-time interest?

Just before I sign off more on *C.marjoriae*. I was in the fish collection a while ago and noticed a new accession still not put away. It contains 2 chunky Hardyheads from Magela Creek, Jabiru, N.T. June 1972. They have a well-marked row of dark spots below the lateral stole. The specimens are from Walter Ivantsoff (Macquarie Univ., expert in this genus!) and are so labeled.

Best regards,

Yours sincerely,

Ian Munro

This was the last letter Ron ever received from Ian Munro.

*Ron became heavily involved with ANGFA, as Editor of
'Fishes of Sahul'.*

*However, he has long regretted not informing Ian about ANGFA ...
Ian would surely have loved to have had some involvement in this area
about which he was so passionate.*

Heide, Nov.15th. 1976

Dear Ron,

Meanwhile since our return from Australia about four weeks have gone. Now everything for us is dreamlike. We saw many different landscapes, animal species and sorts of vegetation. Perhaps the most impressive was the Victorian rainforest which you so kindly showed to us. Even the tropical rainforest in Queensland seemed to be not as majestic. Many thanks once again for your hospitality. Yesterday I received your letter to me from Ian Munro. If I look on your fish list I should say at a first impression, that those fish cannot be a pest for Victoria, since it is hard to believe they would sustain the cold season of a climate which supports the growth of daffodils and peaches as they can be seen in the picture.

On the other hand I will discuss this list with some German experts, which of course will take some weeks of time. But I think that I can then give you a more reasonable statement.

The bird book by the way has in reality not been lost. Cilli didn't check our big baggage carefully enough. We apologize for this very much.

Unfortunately I could take to Germany only three types of Rainbow living pairs, among them a pair of the Gin Gin fish. I intend to tell more details in a letter to Heinz Staude. Now I only mention that we found a swamp full of *Pseudomugil gertrudae* south of Darwin.

Best wishes to you and your family,

Jurgen Clasen

33 Matson Crescent
Yowie Bay
NSW 2228

17th. December 1987

Mrs Effie Howe
29 Welby Street
Eastwood
NSW 2122

Dear Effie,

I was most surprised and delighted to receive your letter of October 18. I tend to procrastinate these days, especially with correspondence thus this late reply.

Of course I remember you from Cronulla, and Benny was delighted to see your letter and to hear what you have so far done with your life. We eventually had to sell our house to a bulldozer for redevelopment as high rise when the planners moved the southern limit to our front fence. We moved to a big old house near the Camallia Gardens with a view of Yowie Bay in 1973. All our children are now married. Donald was first and lives in Woolooware Road and has three children, the latest only two weeks old. Benny was next and lives Marrickville and has two girls. The other two got married this year, Moira in February and is now living in Brisbane and Lindsay in October and is living at our address in the lower level converted rumpus room.

I had to retire from CSIRO in 1984 on the eve of my 65th birthday but left a great deal unfinished. CSIRO Division of Fisheries & Oceanography was split into two, Oceanography and Fisheries Research and both were relocated in a new building complex in Hobart during late 1984 and early 1985. I escaped because of old age and it was anything but a popular move for most staff. The CSIRO laboratory site has been taken over by the State Department of Agriculture's Fisheries Research Institute. Here much the same is going on but the people sitting in the same places have different names and faces. I occupy a small office here still with access to library but without wet laboratory facilities. My big fish reference collection went to Hobart. I try to keep abreast with literature research on fish and have not quite abandoned my plans for a handbook of Australian fishes. Before I get my teeth into that I have to finish two large papers for my reports on the 1963- 65 Gulf of Carpentaria Prawn Survey - Prawn biology, and benthic Fauna. Also to see the light of day is one on the eggs and larvae of the Australian Salmon dating back to 1962 or 1962.

Benny took to nursing doing her general certificate at RPA and her midwifery at King George. She liked the babies work and got into nurse education, becoming a Fellow of the Australian College of Nurse Education (or whatever). She currently works part time as Nurse Educator (midwifery) at Canterbury Hospital and has started a BA course (Nursing Diploma) at Armidale. As you can guess, she is quite a busy girl. Her husband is in accountancy. Donald took on law and is now a partner with a big city firm of solicitors which handle amongst other things a lot of medical defence. Moira is an accountant with Ikea and her husband is State Sales manager for Otis Lifts & Elevators. Lindsay is in aluminium and "wedding cake" as production manager for Colonial Castings at Caringbah.

Apart from creaky bones and other things associated with advancing age my wife and I remain pretty active and always busy. Joan has learnt to live with diabetes and I have had cataract surgery but have regained excellent sight.

When we moved to Yowie bay I lost my little fish house but have still got all the tanks but not a great many fish now. We have a long narrow garage in the lower level and this has to house a comprehensive workshop, two cars and over 50 fish tanks. It is not too satisfactory for insulation or lighting, especially since when I fitted a roll-O-door and built a shade house for ferns along the window side. Dust is a big problem from the workshop end. Having to depend largely on my superannuation pension these days I find it difficult to finance stock and electric power for tropicals, and have taken over many tanks for goldfish. Years ago at Cronulla I used to keep many native species including blue-eyes and rainbows. I used to have more species of rainbows than most aquarists had ever seen, having rediscovered *Melanotaenia nigrans* proper. Besides this I had *Nematocentris rubrostriata* from Torres Strait Islands and a new species from the Laloki River, Papua. All my old contacts are no longer around and I cannot get this sort of material any more. I am also finding it hard to come to grips with existing price structure of tropicals and goldfish. When I see the few miserable aquatic plants available, I am wondering what has happened to all the old well tried favourites. Also I am nostalgic about how I used to throw all my surplus growth on to the compost heap.

Every now and again I get a burst of enthusiasm and clean up all the tanks but I am afraid that by diversifying into other hobbies aquariology has lost its punch. However my earlier efforts seem to have encouraged you to get into fish keeping. I suppose the only opportunity in NSW to follow up in fresh water work would be with F.R.I. at Cronulla or at the Narrandera station. There must be about 80 or so on the staff here including researchers, technicians and administrative support. I have been on the site since F.R.I. moved here about the middle of 1985 and a lot of people seem to have come and gone, possibly as they have been hired for shorter term projects after graduation. I understand a lot of staff preferred the older regime when state Fisheries was Chief Secretary's department rather than Agriculture. In retrospect I would never have thought you would be moving on into a career as a biologist or keeping up a continuing interest in fish.

I shall look out for your forthcoming paper in Aust.J.mar.freshw.Res. 38. The Atherinid fishes have always been of special interest to me, but my former off-sider Jerry Allen seems to have taken over on the Melanotaenids and Macquarie University with Walter Ivantsoff being the other throne. Lucy Crowley has offered me co-authorship on *Craterocephalus*, having got new material of a new species which I found in the Norman River, Gulf of Carpentaria. I am about to have a stir about the Crowley, Ivantsoff & Allen paper on *Melanotaenia* in Aust.J.Mar.Freshw. Res. 37 (1986). By any chance were you involved in the rearing of the eggs and larvae? According to p. 385 breeding stock of *M. fluviatilis* was from Tabulam (Clarence R. drainage) and *M. duboulayi* from Pomona (Brisbane or Mary R. drainage) - meaning both stocks came from the coastal side of the watershed divide and are thus both *M. duboulayi*.

On the subject of meetings, I now avoid them because I am now rather hard of hearing and seldom go out at night. According to the latest ASFB member list I am included but I have never really joined. However I did attend the big meeting in Darwin last August as an "Exhibit A" type guest at cost to the society and Ansett.

It is good to hear from you after all these years and to find out that you are wife and mother as well as having career interests and fish keeping habits. Best wishes for the festive season and the New Year that will soon be with us.

Yours sincerely,

Ian Munro

29 Welby St
Eastwood 2122
12/11/97

Dear Ron and Audrey,

I received Ian Munro's CV from his wife yesterday and am passing it on. Publication wise he was a very busy man. I'm also including a letter than he sent me in 1987.

You asked for anything that I might remember about him. I lived in a block of flats next door to his house in Cronulla from the age of 7-15. I remember him as a very big quietly spoken man who had a fish room (the first one that I'd ever seen) with fish that I'd never seen before. I fell in love with that room. As we lived in a flat you couldn't have much in the way of pets. I was allowed a gold fish. Ian Munro's wife Joan pronounced my first gold fish dead. The only other thing that I particularly remember was that while the Munros were away on holidays I was entrusted with feeding their fish while I was pretty young 9-11. This involved collecting wrigglers from the rock pools at the back of Shelley Beach. I hadn't realized they were there until he told me. I still collect them from the same place today.

Ian Munro had 4 children (2 boys and 2 girls) including a daughter my own age. They were all very pleasant people.

Even though he did not know it until I wrote to him in 1987 it was seeing his fish tanks with rainbows that made my mind up at a young age that I wanted a career in fish biology. I keep many fish as a hobbyist but think that I'm still waiting for the career bit to occur!!!!

Regards,

Effie

RON BOWMAN – 70 Years of Fishkeeping

by Gary Moores (reprinted from October issue of VicNews)

Floating About visits ANGFA Life member Ron Bowman and his wife Audrey. Ron has been keeping and breeding fish since 1937 having huge success with a large number of species. Most members new or old will know who Ron Bowman is. He has had a long history with ANGFA and was the first editor/designer of *Fishes of Sahul*, 1983-2000, as well as his earlier involvement with other aquarium publications. He is always seen at the meetings talking with other enthusiasts passing on his knowledge and experience. Some of the most entertaining talks I have heard have come from Ron in his relaxed style.

Ron designed and built his fish-room during the 1960's. The walls are Bessar brick and the gable roof is double glazed glass to allow plenty of natural light in. A large deciduous tree shades the roof during summer while allowing the winter sun to penetrate. The floor is 6 inches thick concrete with reinforcement to deal with the weight of the tanks and water. Above the central ceiling is a mains-fed 200 gallon tank for a constant supply of aged water. The room houses over 100 tanks of various sizes and shapes. Conventional step back racks are used to hold the tanks allowing easy access for

feeding. There is plenty of solid material, including water in the room, which acts as a heat bank stabilizing the temperature. During the winter a gas heater is used to keep the room at 23-25°C. Fish are selected for the various levels on the stands with those requiring higher temperatures positioned nearer to the top.

Several years after the original room was constructed another room was added – affectionately called “the annexe”. The room is 12 foot square. It houses six elevated 80 gallon ponds used to simulate a more natural environment. The roof is half glass and half acrylic sheets to again allow plenty of natural light in. The ponds are heated from beneath by individual Bunsen Burners which are manually regulated according to temperature requirements. It is a great sight to see large schools of beautiful fish swimming up and down the ponds.

The ponds and all the shelving and available space are used to grow aquatic plants, both under water and emerged. (Just prior to my visit, Ron had an unwelcome visitor in the annexe. A possum had fallen through the roof and in its panic to try and get out, knocked over most of the containers of plants and made a huge mess before eventually finding its way out).



Ron Bowman harvesting brine shrimp – photograph by Gary Moores

I have had the pleasure of knowing Ron for several years now and being a visitor to his house on a regular basis over that time. Time seems to stop whenever you visit. Ron will happily talk for hours about his fish and how he keeps them so successfully.

For Ron the challenge of the hobby is to learn by patient observation, so as to understand why fish and plants behave as they do. Ron has developed a "*got a feeling for what the fish need*". As he says you need to listen to what other people are doing and then make your own mind up on what works.

Ron is a firm believer in what he calls the natural aquarium or the "old style" of fish keeping. He keeps species tanks with low fish populations and with good plant growth. This helps remove fish waste and ammonia from the water. Minimal water changes are conducted, mostly just top ups because of evaporation. As he points out you can neglect a tank, but you can't neglect a tank without plants, it's a recipe for disaster. Ron doesn't rely on filtration, only using it as an occasional 'clean-up' tool or to supply a gentle current for those fish which come from a river environment. When you see his fish you have to agree that he must be doing something right. Ron is proud to claim he seldom has sick fish and mostly when he loses a fish it is because of their old age.

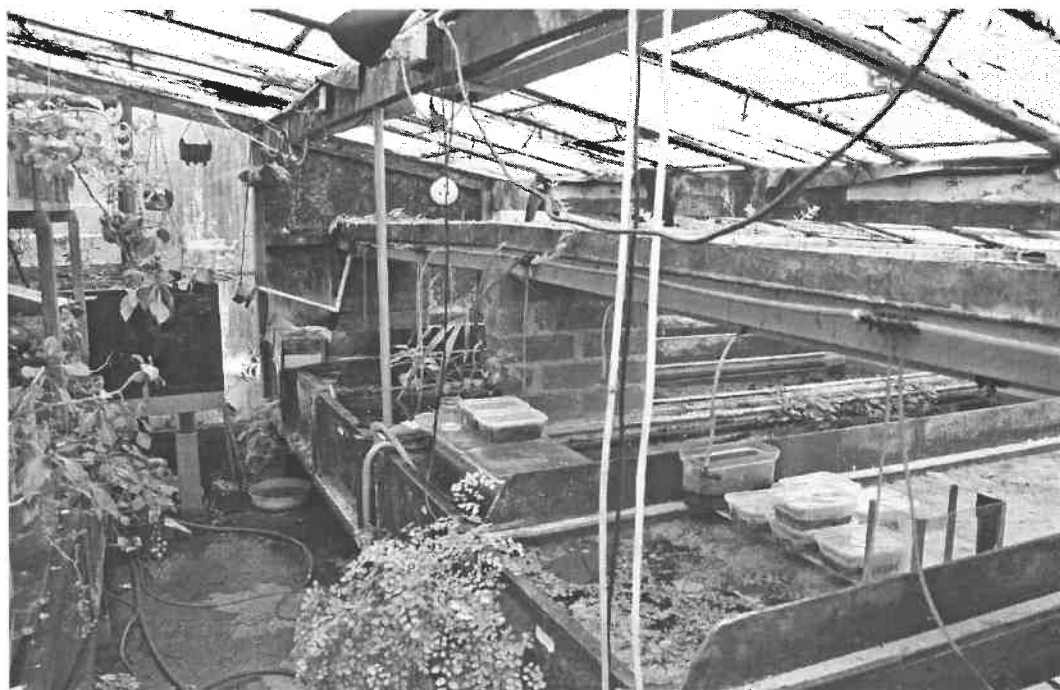
Some more of Ron's tips for successful breeding and raising fry include adding a small amount of pure calcium to the water. This helps the fry to grow their bones and nerves. He has found

that if calcium is not available, particularly in soft water, the fry start to die one by one leaving only one or two healthy fish. Pulverized eggshells are ideal and easy to obtain. Ron also recommends that you keep the hardness above that measured in nature because we basically trap the fish in a box rather than flowing rivers where the calcium is continually available. This will lead to more relaxed and healthy fish.

Continuing with his natural approach Ron uses pond snails as hardness tests. If they squash very easily the tank water is too soft. If the snail shell resists a bit of pressure the tank is okay. He calls them his natural hardness test kit. I don't know if the snails would agree with him!?

Ron has bred more than 210 species of tropical fishes, most of these prior to 1978. He is not that interested in fish that grow larger than 150mm, preferring to keep only the smaller rainbows and blue-eyes. His fascination with Sahul fishes began when they started arriving into Australia from New Guinea. He bred his first New Guinea rainbowfish in 1963. Over the years he has kept and bred most of the Australian rainbows and blue-eyes. Ron also pioneered the distribution of "ANGFA eggs" to many countries around the world by air-mail. Fish eggs were sent to breeders across the world, giving people earlier access to fishes that were not yet commercially available. Another proud moment for Ron is the fact he was so successful at maintaining the three species of the South American Emperor Tetras. So successful

Below: "The Annexe" — photograph by Gary Moores





Above: "The Fish Room" – photograph by Gary Moores

were his achievements that he was able to send one hundred of his Emperor breeders to Germany when that species had been lost to the overseas aquarium trade. He still maintains descendants from his original stocks.

Some of the ANGFA species Ron currently keeps include:

- Pygmy Blue-Eye (*Melanotaenia pygmaea*)
- Mountain Rainbowfish (*M. monticola*)
- Western Rainbowfish (*M. australis* – Drysdale River)
- Exquisite Rainbowfish (*M. exquisita* – Waterfall Creek)
- Lake Tebera Rainbowfish (*M. herbertaxelrodi*)
- Boeseman's Rainbowfish (*M. boesemani*)
- Slender Rainbowfish (*M. gracilis*)
- Banded Rainbowfish (*M. trifasciata* – Pascoe River)
- Spotted Rainbowfish (*Glossolepis maculosus*)
- Pseudomugil signifer* (Cairns variety)
- Delicate Blue-Eye (*P. tenellus* from Northern Territory)
- Spotted Blue-Eye: (*P. gertrudae*)
 - Polo Creek, Cape York
 - Cadell River NT
 - Aru Islands
 - Sandy Creek NT
 - Charlotte River NT
 - Melville Island

Honey Blue Eye (*P. mellis*)

Threadfin Rainbowfish (*Iriatherina werneri* from NT)

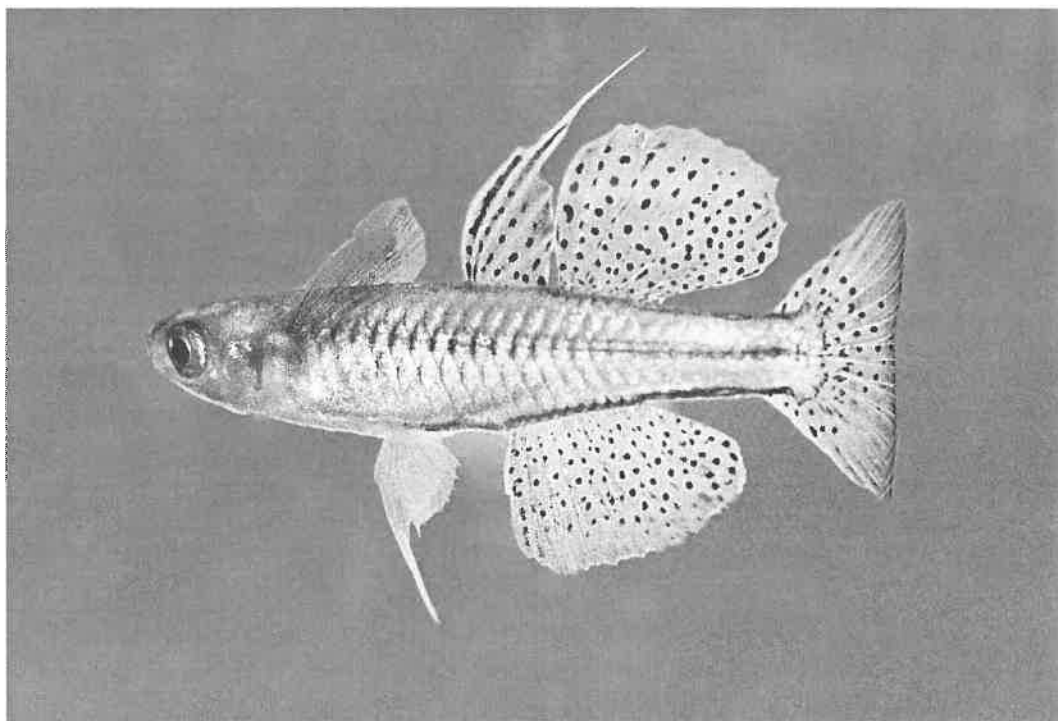
Poreless Gudgeon (*Oxyeleotris nullipora* from NT)

When asked about his favourite fish (and this is a tough question), Ron will always mention the Blue-eyes with a particular affection. In particular Ron has a fascination for the Spotted Blue-Eye (*Pseudomugil gertrudae*) and has kept and bred these tiny native fish since first acquiring them in 1965. He is particularly interested in the different morphs.

Field trips to Cape York and the Northern Territory with Dave Wilson and Bruce Hansen among others allowed him to keep 16 different morphs over the years.

Ron, a Commercial Artist before he retired, produced illustrations of 12 different morphs, which took over 1000 hours to complete – a real labour of love! These illustrations and the stories that go with it are in *Fishes of Sahul*, Vol. 13. Number 1, March 1999. It's well worth diving back through your old issues to read the story again. The original illustrations are now in the Museum and Art Gallery of the Northern Territory collection, Darwin. Hopefully these will be on display next year (2007) in Darwin where the next ANGFA Convention will be held.

The Melville Island Gertrudae species were given to Ron seven years ago by Helen Larsen of the Darwin Museum. They had been collected



One of Ron's favourite fish – the Spotted Blue-Eye (*Pseudomugil gertrudae*) from Bathurst Island
– photograph: Neil Armstrong

during a survey of Melville Island off the coast of the NT. Ron's population is now the last surviving in captivity. They are the smallest of the known Spotted Blue-eye morphs, are great little display fish and every visitor to Ron's always asks what they are. They keep breeding in small numbers allowing his population to survive.

Amongst Ron's long time favourite fish are his Pascoe River tri's (*M. trifasciata*) and a very colourful form of Lake Tebera Rainbowfish (*M. herbertaxelrodi*), the latter the result of careful selection of the best male over several generations. Ron also keeps three pet mud skippers which are tame and worthy of a story on their own.

Sadly for Ron and more so for the keepers of native fishes in Australia, the life of his fish rooms is drawing to a close. Time may be meas-

ured in months rather than years.

As Ron put it, there is now too much work required for an eighty year old to keep it going. He is hopeful there are people in ANGFA who will continue his passion for these incredible fishes and to preserve some of these rare populations.

It was a pleasure to visit Ron's place and talk fish with him as well as to pass on some of his thoughts and knowledge to the readers.

Ron's final words to me on the day of my visit will also be my final words. "Without a wonderful and understanding partner we wouldn't be able to keep fish – but never have separate electricity and gas meters for your fish room ... that would be pushing your luck a bit too far when the bills come in."

In the year 2007 after 70 years of keen observation and breeding of fishes, Ron Bowman is still trying to work out how to retire from his hobby ... how to break the time consuming habit of all but the first 11 years of his life.

He is still asking Questions ... seeking Answers ... like:

Will the *Melanotaenia australis*, from Drysdale River in the Kimberley always carry that name? Or will the differences between it and other *australis* eventually give it a unique identity ... see Ian Munro, page 108, (Kimberley species similar to *M. ogilbyi*).

Will the Rainbowfish from the Upper Burdekin River ever get rid of its *splendida* tag?

Are the little Rainbowfishes in the crater lakes and creeks on the Atherton Tableland really all *M. eachamensis*?

Is the little Burton's Creek (NT) Rainbowfish really a *maccullochi*?

Will the coastal populations of *Pseudomugil*, (*signifer*), ever wear different identities to go with their amazingly diverse forms, colours and finnage? (See pages 37, 38) and why is the Harvey Creek male *P. signifer* so belligerently territorial compared with the other *Pseudomugil* along the east coast of Australia?



Melanotaenia inornata – N.Q. Chequered Rainbowfish –
p. 2, 3, 6, 7, 9-12, 14, 16-19, 33, 64, 85, 108.



Melanotaenia rubrostriata – P.N.G.
Red-Striped Rainbowfish – p.33, 64, 107, 108, 115.



Melanotaenia sexlineata – P.N.G.
p. 100, 101, 102, 114, 115.



Melanotaenia papuae –P.N.G.
p. 100, 101, 102, 114, 115.



Melanotaenia nigrans – N.T., N.Q.
p. 16, 27, 33, 35, 53, 64, 68, 70, 85, 108, 115, 120.



Melanotaenia maccullochi – N.Q. Cairns area.
p. 31, 33, 64, 68, 85.



Melanotaenia fluviatilis – S.Q., N.S.W., VIC, S.A.
p. 19, 20, 26, 27, 34, 64, 68, 70, 99, 105, 109, 114, 120.



Melanotaenia duboulayi – Q.
p. 99, 105, 120.

: photos by Neil Armstrong



Melanotaenia trifasciata – N.T., N.Q.
Goyder R. – p. 20, 32, 108, 114.



Cairnsichthys rhombosomoides – N.Q., Cairns area.
(Babinda Sunfish) p. 9, 32, 98, 106.



Melanotaenia australis (Katherine R., N.T.)
p. 59, 64, 73, 75, 82, 88, 89, 95, 96, 97.



Melanotaenia australis (Drysdale R., Kimberley, W.A.)
p. 71-72, 114. (similar to ogilbyi ?)



Rhadinocentrus ornatus – Q.
p. 19, 20, 33, 36, 51, 67, 99, 101, 102, 106.



Craterocephalus stromineus – Blackmast, N.T.
p. 3, 8, 18, 21, 49, 51, 55-61, 83, 84, 86, 89, 108.



Pseudomugil signifer – (Awinya Ck.,
Fraser Is., east coast Aus). Blue-eye
p. 26, 27, 37-40, 67, 105?, 116.



Pseudomugil mellis – S.E.Q., Fraser Is. area.
Honey Blue-eye, p. 20, 116.

: photos by Neil Armstrong

IAN STAFFORD ROSS MUNRO – CURRICULUM VITAE

Born at Brisbane; May 4, 1919

Primary education at Coorparoo State School, obtaining pass in State Scholarship Examination in 1932.

Secondary education at Brisbane Grammar School 1933-1936. School prizes for art (Junior School 1933) and science (Chemistry and Physics, Senior School 1935 and 1936). Qualified for Junior School Certificate in 1934 and Senior School Certificate in 1936.

Tertiary education at the University of Queensland with degree course in Science during 1937-39, majoring in Organic Chemistry and Zoology. Awarded degree of Bachelor of Science in 1940.

Undertook one year full time honours course at Zoology School, University of Queensland in 1940 specializing in Marine Biology. Thesis on marine fauna and ecology of Green Island, Moreton Bay, including shoreline, benthic and plankton communities. Awarded Degree of Bachelor of Science with First Class Honours in Zoology in 1941.

In 1940 was appointed to the Reserve Military Forces with commission of Captain

In early 1941 spent several months at CSIRO Division of Fisheries, Cronulla Laboratories to obtain practical experience in fisheries research methods. Was appointed Walter and Eliza Hall Fellow in Economic Biology at the University of Queensland (1941-1942). Undertook investigation of the biology of the Narrow barred Spanish Mackerel. Publications included a revision of the genus *Scomberomorus*, and description of eggs and larvae of *S. commersoni*.

From August 7, 1942 to July 5, 1943 served as a Hygiene Officer with the Australian Army Medical Corps, Australian Military Forces and Australian Imperial Force.

In July 1943 CSIR obtained my release from military service and transfer to the Reserve of Officers. Was appointed as Assistant Research Officer, CSIR Division of Fisheries on July 1, 1943 and stationed at Cronulla headquarters, except for a period during 1943-1945 as Queensland representative of the Division in Brisbane.

Early work with the Division centred around estuarine fisheries, especially the biology of black bream (*Acanthopagrus australis*). This investigation provided the subject for a master's degree thesis. The degree of Master of Science was conferred by University of Queensland in 1944.

Between 1943 and 1963 research at CSIR Division of Fisheries and CSIRO Division of Fisheries and Oceanography, centred around the biology of bream and Spanish Mackerel, developmental stages (eggs, larvae and post larvae) of fishes, and general fish taxonomy. Publications comprised taxonomic revisions, descriptions of new species and descriptions of developmental stages.

In 1948-1950 CSIR Division of fisheries undertook a survey of the fisheries resources of Papua New Guinea in conjunction with Commonwealth Department of research vessel *Fairwind* for extended cruises in 1948 and 1949. Extensive taxonomic collections provided substances for two large publications *The Fishes of the New Guinea Region* (checklist of 1429 species, published 1958) and *The Fishes of New Guinea* (text book of 1069 species. Xxxvii + 650 p., 6+78pl. Published 1967).

In 1951 was seconded to the Government of Ceylon (now Sri Lanka) as Technical Advisor to Ministry of Industries, Industrial Research and Fisheries, being the first technical advisor sent by the Australian Government to Ceylon under the Colombo Plan of technical aid to south-east Asia. Work involved to organization of their fisheries research unit and training of graduate researchers in fish taxonomy and fisheries research methods. One result was publication of the text book *The Marine and fresh water fishes of Ceylon* in 1955 (xvi + 349 p., 56 pl. covering 846 species).

During the 1950's specimens from the New Guinea survey, together with specimens from Australian surveys and miscellaneous field investigations were gathered into an organized reference collection

similar to those held by natural history museums. The collection, now known as the Ian S.R. Munro Ichthyological Collection currently comprises about 6,000 specimens including nearly 1800 registered lots and containing representatives of about 2,500 species. The assembly, identification and curatorial care of the collection has been a personal responsibility until retirement in 1984.

A major CSIRO project had been the publication of a *Handbook of Australian Fishes*. The first version was published in serial form as supplements to *Australian Fisheries Newsletter*. 42 parts covering 1013 species were published between 1956 and 1961. About half of the Australian fish fauna is covered. In 1973 work began on a revised version.

Appointed project leader of the Gulf of Carpentaria Prawn Survey conducted during 1963-1965 jointly by CSIRO Division of Fisheries and Oceanography, Commonwealth Department of Primary Industry and Queensland Department of Harbours and Marine. Research was carried out on Prawn taxonomy, distribution and biology, physical and chemical environment and composition and distribution of benthic organisms. The resource prospecting aspect led to the opening up of prawn trawling in the Gulf of Carpentaria and other parts of tropical Australia, with the Gulf being the major fishing area for a multi-million dollar industry. Papers have been published on banana prawn biology and benthic ecology. The main results are now being published in a five part Atlas of operational, environmental and biological data from the Gulf of Carpentaria Prawn Survey, 1963-65. A coloured contour chart of the southern Gulf was published in 1967 to assist vessels in the early stages of the commercial fishery.

Retired from CSIRO Division of Fisheries Research on May 3, 1984 with 41 years continuous service as Assistant Research Officer 1943-1946, Research Officer 1947-1953, Senior Research officer 1954-1957, and Principal Research Scientist 1958-1984. Appointed Honorary Post-Retirement Research Fellow May 4, 1984.

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