

MARCH 1981 60p

# AQUARIST

AND PONDKEEPER

*The Magazine for Fishkeepers*

*In this issue:*

**THE SNAPPER FROM SAUDI ARABIA**  
**which eats Killifish!**

*Colour feature*



# THE AQUARIST

AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

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The Editor accepts no responsibility for views expressed  
by contributors.

# What is Your Opinion?



by B. Whiteside, B.A., A.C.P.

"I'M THAT 'Turkish Aquarist' again and I wish to thank you for printing and commenting on my letter in the September, 1980, issue. I have made two good friends from your country since then and continue to correspond with them," writes Mr. Osrām Tümay, of Bağdat Cad. 167/1, Beyazkösk Ap. D.4, Konak, Kızıltoprak, İstanbul, Turkey. He continues: "In the October issue of the magazine I read the article titled 'The Truth about Lyres' by Mr Dawes in complete admiration and cursed myself for thinking that my male lyretail would fertilize the female lyretail given by a friend at my office for that specific purpose. His female had been living in the absence of a male of any sort for about four to five months—before which she was a small fry—and my friend asked me if it wasn't time my male's bachelor days came to an end.

"She had a swollen belly with a light brown patch at the back prior to the wedding; and after staying for a week with the male she was now making her way back home in a moderate sized sweet jar; and at that moment I was about to finish Mr. Dawes' article in deep self-humiliation when my friend cried: 'There are at least a dozen fry here!' And he was right.

"The spawning of a lyretail is not an incident that occurs frequently in an office, so many witnesses filled the room as she gave birth to more than fifty healthy fry. We are both positively sure of two things: (1) that the female was fertilized for the first time; and (2) my male is a true lyretail.

Mr. Dawes, in his article, completely rules out the possibility by including a sketch showing the difference between gonopods (*sic*) of normal and lyretail males. Then, am I the first to own a fertile male lyretail, or where did we go wrong?

"On closing, I wish to congratulate you for all the recent improvements in your magazine. Is there any possibility of the magazine printing only colour photographs?"

My article entitled *Wagtail Lyretail Swordtails*, appeared in the February, 1971, issue of *The Aquarist*. Readers may be interested to note that I mentioned, in my article, that the wagtail lyretail male swordtail was unable to mate with the female. I used a 'normal' red wagtail male to mate with a red wagtail lyretail female swordtail. As I said in my article: "...What did I get? Well, here goes: 20 red wagtail lyretail sword, nine plain red lyretail swords, one golden lyretail sword, two green lyretail swords, and five green wagtail lyretail swords; plus six plain red swordtails, two plain golden swords, three plain golden wagtail swords, ten plain red wagtail swords and two plain green wagtail swords—quite a mixture!..." I mentioned the fact that I was left with 37 lyretail swords and 23 non-lyretail swords.

Photographs 1 and 2 show a female and a male red wagtail lyretail swordtail. Readers wishing to breed lyretails need purchase only a female lyretail and a normal male of the same colour. Plenty of male and female lyretails should appear in the resulting fry.

Several points in Mr Tümay's letter merit mention. One, he obviously intended to write 'gonopodia' and not 'gonopods'. Secondly, he stated that the lyretail female had "a swollen belly" before the lyretail male was placed with her. This suggests that she was already pregnant before the lyretail male was introduced; and she could not have produced fifty healthy fry only a week after being fertilized by a male. I can but assume that she must have been fertilized months earlier by one of her male siblings. What is your opinion? I think we can rule out parthenogenic birth. Thirdly, if we published only coloured photographs in our magazine its price would have to rise considerably. I must say that I consider a good black-and-white photograph of a fish or plant to be hard to beat—and it's more difficult to take than a coloured one. I find bad coloured photographs much more offensive than bad monochrome prints. What is your opinion?

## Fish surgery

Mr. Andrew Robinson writes from Coleridge B, Christ's Hospital, Horsham, Sussex, to say: "... I had a big female angel fish, in my community tank, that got attacked by my pair of kribensis while they were guarding eggs. She ventured too near the entrance and the male, at the speed of light, had poked his head out of the cave and taken a lump out of her neck. I was amazed to find my angel fish with a piece missing, just below the gills, still swimming about as if nothing had happened.

"This flesh wound was obviously open to infection and fungus. I did my best to keep the fungus away; but it came. The fungus grew inwards as well as outwards and

Female red wagtail  
lyretail swordtail.



the fish soon had respiratory difficulties as the growth slowly blocked her throat. It got progressively worse and was not responding to any treatment. In a period of about ten days from the first wound it was evident that unless something was done, and done quickly, she was going to die. I considered the 'humane dispatch' but did not wish to do this unless absolutely necessary as she was a founder member of my 48 in. aquarium and I had grown very fond of her over the 18 months I'd had her. The problem was first to clear her throat so that she could breathe and then set about clearing up the fungus infection. I decided to perform a tracheotomy—that is, by-pass her blocked throat. This means, in essence, cutting a hole in her throat so that she can breathe through it. This was done with a sharp scalpel and the wound cauterised by burning away decaying flesh with a nearly red-hot kitchen knife.

"The whole operation was done in three one-minute sessions with five minutes' rest for her in between. So now I had an angel fish breathing normally through a hole in its neck about the size of the end of a match. The fungus was cured by dosing the water with double the amount of cure and also by soaking food in it. She soon learned that by swallowing food in the roof of her mouth it did not come out of the hole!

"I hope you find this true story interesting. Also, I regret to say that due to a randy male pecking her on the neck the wound opened again and I had to kill her; but this does not discourage me and if I ever have to face a similar situation again I will perform the same operation."

#### Vet for treatment

Master J. Darkin is 16 years old and lives at 'Wayside', 79 Alderbrook Road, Solihull, Warwickshire. He says: "The most effective treatments I have found for my fish are obtained from the vet. If your fish are troubled by a

serious disease the vet will dispense an antibiotic. You must take the extra care needed with these treatments. Some need large water changes after use; others have to be sprinkled onto moist food. I'm sure you will find the results excellent. They are very cost-effective: I am usually charged 50p; but an expensive post mortem may be needed. Above all, use these drugs wisely and return any the shelf-life of which has expired.

"In the December, 1980, issue you published a letter by Mr. Steve Keay. I would like to inform Mr. Keay that a hybrid cross between different species of angel fish may well result in all the young dying. At the present time I possess a male veil angel and a female marble angel that breed regularly at ten day intervals; and the young die off after about five days, all at once, whether left with the parents or removed to a separate tank. If Mr. Keay was considering breeding with his young fish of the same type, he should not encounter any difficulty as long as he does not take the breeding any further than the young he has at present, i.e. an F2 generation as the parents."

I should point out that veil and marble angels are not different species; they are the same species; indeed they are different *forms* of the same species. I don't think that the deaths of the babies could be attributed to their having angel parents of different varieties.

If all goes well, by the time you read this I should be a smoker who has not smoked for two years. I'm typing this on Christmas Eve and today a kind uncle whom I have not seen for some time presented me with some cigars for Christmas. Shortly after his departure I presented the cigars to another relative who still smokes. How's that for an example of charity and self-discipline! Have any readers also managed to give up the smoking habit? I know I feel much healthier; I hope my fish do too because now I can afford to buy them the occasional tin of more exotic food.

#### New names

I was pleased to receive a copy of the latest edition of the *Newbury Neon*, the club magazine of Newbury and District Aquarist Society. It is edited by Mr. Les Hart, of 29 Kestrel Close, Thatcham, Berks., and I am pleased to note the magazine's return after a 12 month's break. On page seven there is a useful list of some of the fish that have had their scientific name(s) changed during the past few years. I trust Mr Hart won't mind if I reproduce his list. In each case the common name is followed by the former name and then the latest name: rams—*Apistogramma ramirezi*—*Papiliochromis ramirezi*; Texas cichlid—*Herichthys cyanoguttatus*—*Cichlasoma cyanoguttatum*; mollies—the genus *Molliensia*—*Poecilia*; limias—the genus *Limia*—*Poecilia*; barbs—*Barbodes*, *Capoeta* and *Puntius*—*Barbus*; guppies *Gambusia holbrooki*—*Poecilia reticulata* blue acaras—*Aequidens latifrons*—*Aequidens pulcher*; and kribensis—*Peimatochromis kribensis*—*Pelvicachromis pulcher*.

Mr. Bill Heritage, of Wildwoods Water Gardens Ltd., Theobalds Park Road, Crews Hill, Enfield, Middlesex, sent me a copy of the *Wildwoods Book of Ponds and Aquariums*. In a short letter he wrote: "Re the punctured pond (*Aquarist*, December, 1980) the rubber dinghy was a brilliant idea. For pond owners who don't have a rubber dinghy handy alternative suggestions will be found below". 'Below' refers to the following section quoted from the book. It was written by Mr. Heritage and is entitled 'Spring Cleaning the Pond'.

#### Pond cleaning

"What shall I do with the fish? It is definitely not necessary to clean out the pond as an annual routine. Just how long it will be before this attention is necessary—and on the whole we are in favour of leaving well alone—will depend on how quickly it accumulates rubbish in the shape

of decaying plants and fallen leaves. There are several ways of postponing the need for a clear-out-removing, from August onwards, any waterlily leaves and flowers as they pass their best; trimming back to water level the foliage of marginal plants as soon as they are touched by frost; cutting back oxygenator growth in September to 4-5 in. to prevent the bulk of it decaying in the pond; and replacing about a third of the pond water with slowly introduced tap water in April—but sooner or later the time will come for a spring clean.

"And the spring or summer is the time for it, not the autumn, so there is no need to dabble in cold water. You pick any weekend from April to July when it's warm enough for a paddle, and go to work. But not until you know the answer to the question of what you are going to do with the fish. There are several solutions to this problem and—except perhaps for two or three small fish—the plastic dustbin is not one of them. You need something shallow with plenty of surface area. One answer is to monopolise your domestic bath for a week but this is seldom convenient. Another is the use of a stock tank, two sizes of which are described in the glassfibre pond section. A third is to knock up a makeshift above-ground pond which can be quickly dismantled once it has served its purpose.

"This can be done easily enough by placing boards or planks on edge roughly nailed together to form a rectangle about 12 in. deep, and in area about half the size of your pond. In the absence of planks such articles as peat bales, bags of sand/soil/fertilizer, and even ladder sections faced with bits of hardboard may be pressed into service. Anything, in fact, that will contain pressure once the cavity so formed is draped with a sheet of PVC, or a double thickness of polythene, and filled with water. It may not look pretty but it won't be there for long.

Male red wagtail lyretail swordtail. Notice the over development of the gonopodium making the fish unable to mate.



"Whichever sort of temporary container is used, it must be filled with tap water three days before you intend to transfer the fish. In that time chlorine will disperse, ambient temperature will be achieved, and fish will suffer no damaging shocks either from chemicals or a drastic temperature change. Make doubly sure by adding Haloex.

"That done, you are ready to proceed, as follows. Pump or siphon most of the water out of the pond and remove containers (standing them in the shade with lilies and oxygenators covered with wet newspaper) before netting out the fish. If using your fountain/waterfall pump to empty the pool, clear the strainer of debris at frequent intervals. Use a plastic dustpan to scoop out the last of the water and mud. Wash down with plain water—no detergents. Start refilling the pond and add suitable amount of Haloex. Now tackle the plants. Cut off roots and shoots straying from the containers. Tip out, split up and replant in fresh soil any overgrown plants. Return containers as they are dealt with to the refilled pond (they are not needed in the temporary one). Net over the temporary quarters to protect fish from cats. Three days after refilling the pond, return the fish. Dismantle the temporary pond. There, it wasn't so bad, was it? . . ."

Photograph 3 shows an interesting, little garden pond. Drop me a few lines if you spring-clean your pond and let me know if you come across any unusual problems. Incidentally, the *Wildwoods Book of Ponds and Aquariums* is a beautifully-produced publication comprising 48 pages. It contains a delightful selection of black-and-white, and coloured, photographs and drawings of fish, plants, etc. Using it enabled me to identify numbers of the plants in the pond photograph I included in the December issue. I'm sure anyone with, or thinking of starting, a garden pond or an aquarium would find the book both interesting and helpful. *Wildwoods Water Gardens Ltd.* may be contacted, by telephoning, on 01-366 0243/4.

#### Earthworms

Mr. M. I. Eldred wrote to me from Culver, Queens Road Crowborough, E. Sussex, TN6 1PY: "In the September, 1980 issue, you asked for opinions on earthworms as food for aquarium fish. I am one of those who strongly advocate feeding earthworms both to aquarium and pond fish—provided, of course, that the worms are chopped to a suitable size.

"I feel that a word of caution is required as some years ago I lost about a dozen silver and golden orfe due to feeding them with worms from ground which had been manured three to six months previously. At that time there was an advertisement in *The Aquarist* for autopsies being carried out on fish. After much correspondence between the analyst and myself he was able to trace minute quantities of a substance (the name of which I forget) which is produced by worms from freshly manured ground and would prove fatal to fish. So all keen gardeners beware. Apparently reptiles and amphibians are unaffected. How long after manuring it is safe to use the worms I don't know. Do you?



A well-planted garden pond.

"I first started keeping fish at the age of four, the first one being a goldfish that grew into the ugliest fish I have seen but lived to the great age of 34." (Quite a few years have elapsed since last I dissected an earthworm and I am unable to answer Mr. Eldred's question. Can you provide an answer, please? B.W.)

#### Piranhas

"Rosdene", Oak Hill Road, Stapleford Abbots, Essex, heads a letter I received from Mr. S. Clark, who said: "I have kept tropical fish for seven years, and eight months ago bought three red-bellied piranhas at 90p each. They were around 1/2 in. long. I had already prepared my 39 in. tank for them; it contained a U/G filter, Amazon sword, *Vallisneria* and some rock. I put them into the tank, and immediately they hid. In colour they were silver with black spots. I was not sure if one would get killed but took the risk. Their first food was flake. It was not until they were about a month (*sic*) old that their colour was beginning to show. After about two months they were not taking the flake so I changed to pig's heart. It was soon taken; but after about two weeks it was rejected. Next came liver and sliced earthworms, and they too were rejected; and today the above food is still not liked at all. I used kidney and they enjoyed it, up to the present day. Sometimes I feed them live fish, which brings their colours out and also makes them more active—even after feeding.

"In August I came off holidays and one day after I came home I found the smallest one killed due to lack of room. Later I bought some driftwood and a new stock of plants. The rocks were taken out and a new set-up was made. I also changed the light to a much dimmer one, and at once they came out—and they seem to enjoy themselves much more. The plants I bought were *Cabomba*, twisted *Vallisneria*, Amazon sword and some home-grown crystalwort.

"I have heard gory stories about them being man eaters, but I have never been bitten and they have never attacked anything that has been put into the tank to do something. There's even a book in my club that shows natives swimming in piranha-infested rivers—which just goes to show that they are not as dangerous as some people seem to believe unless they are in unnatural conditions and starved.

"Mine are now 6 in. long, have a nice red belly, silverish

coloured middle and a darkish top. If anyone wishes to keep piranhas they should go straight ahead." (I'd advise readers to take care with piranhas: I know several people who've been bitten by them. Some may obviously be more vicious than others; but it would be better to be safe than sorry. B.W.)

#### Marine aquarium

No. 6 Thornton Close, Flore, Northants, is the address of 13-year-old Master David Lobb, who says: "I hope you and your readers will be interested in a public aquarium that I visited whilst on holiday. The Sea Life Centre, at Borecaldine, Connel, Argyll, has one of the best native marine (sections) I have ever seen. It has tanks containing everything from molluscs to sharks. It has large aquariums containing many species; and even one large, open, glass pool that contains starfish, turbot, rays and other flatfish. There is a display of fish farming; and the guide is very comprehensive and explains everything, including the life-support systems."

"I thought you might be interested to hear of my experience with a sucking loach," says 15-year-old Master Justin J. Green, of Langley House, High Street, Kings Langley, Herts. Justin continues: "After I returned from my holiday my 39 in. x 12 in. x 15 in. tank was covered in algae, and only occasionally would I catch sight of one of my angels, neons, bleeding heart or lemon tetras through the pea soup. Whilst glancing through the local paper I noticed a fellow aquarist had some fish for sale, including a sucking loach. The other fish included a magnificent 5 in. red-tailed black shark, in impeccable condition, and a superb 4 in. red-finned shark. The vendor was most helpful and despite being told by my dealer that large sucking loaches were aggressive—and this one was large at 6 in.—it seemed that the fish were getting along well in his tank, so I bought them.

"They settled down all right in my tank, which was sparkling clean in a week. All was happiness and bliss; but not for long, though.

"Soon I noticed that two or three small, white patches about  $\frac{1}{2}$  cm. x  $\frac{1}{2}$  cm. had appeared on the red-tailed black shark's side. As this looked not unlike fungus to me I treated with a well-known British fungus cure; but all to no avail. I consulted my local pet shop man, whose advice had been invaluable in the past; he suggested aquarium salts. These too I tried, without success.

"Then one morning, as I switched on the lights, I noticed the sucking loach knocking the red-tailed black shark around and receiving no challenge from the victim of this antagonistic move. I decided this must be a social problem so I installed another rock cave; so now I have four caves for three territorial fish.

"Still, these guerrilla-like attacks continued—sometimes in broad daylight. Unluckily, I had no other accommodation to offer the red-tailed black shark; my other tank—36 in. x 12 in. x 18 in.—had two kribensis (with beautiful spots I might add) in it and as the female was getting



*Gyrinocheilus aymonieri*, the sucking loach.

plump around the middle and as she and the male were driving a couple of rather robust firemouths from one end of the tank, I didn't feel that this was the ideal home for a convalescing fish. Unfortunately, fate decreed that I had to go away for two days; so I left hoping for the best, expecting the worst.

"When I returned the red-tailed black shark was floating on the surface, dead, with the sucking loach adhering to one side of it. When I removed it, after taking the sucking loach off, all the black, velvety skin had been removed and the white flesh was showing. Sinister!

"After the 'murder' I kept a careful eye on the loach but he never went near the red-finned shark—or indeed any other fish. If any readers have any idea why only the red-tailed black shark was attacked I should be glad to hear from them." (Might the shark have been dead before the loach started to eat it? B.W.)

The fourth photograph shows a sucking loach, *Gyrinocheilus aymonieri*. Have you observed any anti-social behaviour from this species? If so, please send me details.

Mr. P. D. Roe's home is at 26 South Road, High Etherley, Bishop Auckland, Co. Durham. He says: "First, for the people who have not read any of my other three letters in your feature, I will explain my aquatic background. I am 22 years old now and have been keeping fish since I was ten (with a little help from my parents). I have a 12 ft. x 12 ft. fish house now and have a total of 18 tanks, the smallest being 2 ft. and the largest 4 ft. in length.

"In my last letter (July, 1980) I mentioned breeding barbs and gouramies but since then I have sold all my barbs and have now gone back to breeding cichlids—although I am still breeding golden and lace gouramies. Also, I have lashed out and bought myself three discus, which are kept in a 4 ft. tank with a 20 in. fire eel and a *Plecostomus*. I have had them now for about a month and they seem to be faring well. I did have four discus originally but lost one a couple of weeks ago for no apparent reason. Fingers crossed for the future!

"I have also just started to show fish at the local open shows and now it is a weekly occasion. Last week, at the Coer Urba show at South Shields, Newcastle Upon Tyne, I won my first place trophy with a green velifera molly. It was the fish's second time at a show. (I received a

second place the first time out.) It turned out to be a good show for me as I received two second place plaques—for a red-tailed black shark and for four guppies in the guppy breeders' class. Which brings me to my first subject: breeding true pairs of guppies.

"I purchased my true trios at an auction at Middlesborough early (last) year. They were double sword guppies and were auctioned three in a bag—one male and two females. I was very dubious about buying these fish as they were very small; but I really wanted some good guppies and thought 'in for a penny, in for a pound' and I bought three bags at quite a high price. So I had three males and six females. They were placed in a 24 in. x 12 in. x 12 in. tank and grew rapidly. After about three months they began to breed and I eagerly fished out the young and put them in a 3 ft. tank. The parents then began to produce about 200 fry per month so I had the difficult job of housing them.

"When the fry were about two weeks old the males and females, which I could sex at that age by the females' black gravid spot, were placed into separate tanks. As they grew the males turned out to have exactly the same coloration as their parents and the same occurred with the females—although I must point out that the females were colourless. So now I have a good strain of double sword guppies.

"In December last year I bought some dwarf sword plants from my local dealer. These were placed in a 4 ft. tank containing barbs and danios but no other plants. It was a bit of an accident but the temperature of the tank went up to 95°F one week and this went unnoticed for the whole week. Incidentally, as I work as a policeman I sometimes am unable to spend much time in my fish house some weeks, i.e. night shifts. As I said, the temperature went unnoticed and the first thing I did notice was that the three dwarf sword plants became about 20. This happened by the parent plants putting out runners all over the place. This made me notice the temperature of the water and I turned down the thermostat. Since then no runners have been put out by the parent plants; however, the small plants have grown. I can only suggest that a high temperature is an important factor in propagating these beautiful plants.

"I also bought some Java moss a while ago and it has grown in all my tanks at a terrific rate. I was surprised to find that Java moss brought a good price at the fish auctions and these became a good outlet for it.

#### Penguin fish

"Now I wish to tell you of my latest fish-breeding experience. At the end of the previous year I bought six small penguin fish, *Thayeria boehlkei*, from a local dealer. These fish grew rapidly and a couple of months ago the six of them were put in a 30 in. tank of their own while I cleaned out their home tank. I was quite surprised when a couple of days later the Java moss was thick with small fish eggs—all fungused, of course. This made up my mind to try to spawn them properly and I was very upset by how little information there is in the book about these beautiful fish. However, after collating information finally six days ago I decided to try to breed my fish.

"A 24 in. tank was prepared and thoroughly cleaned out. No gravel was put in the tank but it was filled half full with a mixture of tap and rain water. The pH was 6.5 and the water temperature 80°F. I also added the recommended dosage of Tetra Blackwater extract. After two days the fish were added—two males and a female. The tank was covered with brown paper on all sides including the top and a quantity of Java moss was placed in the tank. It was left in complete darkness. Two days later I pulled the brown paper from the front of the tank and saw a large number of eggs in the Java moss and on the bottom of the tank. The parent fish were removed and the tank was shaded again. A small, 3 in. x 3 in. observation hole was cut in the front. The next day, about 16 hours later, I was able to see a large number of fry hanging from the glass and Java moss. I am afraid that this is as far as the saga goes as at the time of writing this letter the fry are not yet free-swimming. I intend to feed them on green water from my pond and also micro worms and *infusoria*. Later I will feed them on *Daphnia* and brine shrimps.

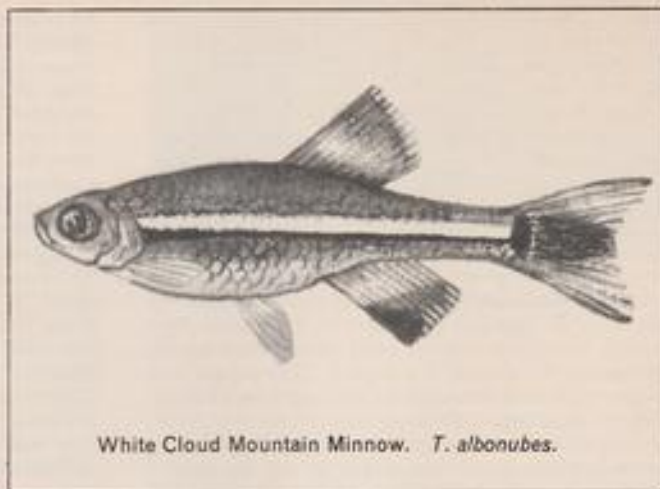
"I hope that in my next letter I will be able to bring you some good news of my results with these fish. I've been a bit long-winded this time but I hope this letter is of help to my fellow aquarists."

A dealer from whom I ordered some plants in the early part of last year delivered one of them, a spatterdock, just before Christmas. It's certainly the largest I have ever seen, having a rhizome about as big as a medium-sized tomato. The big rhizome was so buoyant that I had to place a large rock on top of it in an attempt to keep it buried in the gravel. Even the rock was not enough to keep the spatterdock in the gravel and the rhizome shot floating up to the surface of the aquarium. I finally solved the problem by cutting a hefty chunk of lead pipe and bending it around the top of the rhizome. Then I dug a large hole in the gravel, placed the weighted rhizome in position and heaped handfuls of gravel over and around it. The spatterdock seems to have settled in its new environment and is producing new leaves. I'll keep you informed of its progress. The dealer also kindly sent me a selection of unusual *Apogon* species, most of which are not mentioned in any of my reference books, some odd *Cryptocoryne* species from Indonesia, and a sample of Java moss (he tells me that he now has plenty of the latter in stock from Java). I hope to be able to report on the plants' progress in future features.

Please send me your opinion on any of the following subjects for one of the summer issues. (a) Aquarium lighting—do you find that Gro-Lux, used alone, encourages good plant growth? (b) How effective do you find liquid fertilizers for aquarium plants? (c) Details please of your experiences of breeding any species of tetras. (d) What types of filter do you favour for a community aquarium? (e) What do you use as a background to your aquarium? (f) What do you gain from being a member of a club or society? (g) Do you prefer to use separate heaters and thermostats or combined units, and why? I hope you'll drop me a few lines.



# White Cloud Mountain Minnow



White Cloud Mountain Minnow. *T. albonubes*.

by Jack Hems

THE WHITE CLOUD Mountain minnow is a member of the largest of all freshwater fish families: the Cyprinidae, popularly known as carps. The carps or carp-like fishes range in length from about one inch (as, for example, *Rasbora maculata*) to six feet (*Barbus tor*). The first is widespread over a large area of south-east Asia and is well known to tropical aquarists; the second grows too large and coarse for aquarium use but gives much sport to the angling fraternity in its native India.

The chief characteristic of this huge family is the toothless mouth—the dentition being restricted to one to three rows of teeth set in strong pharyngeal bones which lie behind the gill-chamber. These 'teeth in the throat', so to speak, reduce food to a swallowable size as it passes along to the rear of the mouth and there grinds it under a horny pad present on the base of the skull.

Cyprinids occur in almost every type of water. That is from diamond-bright streams coursing down hills or mountainsides to lowland marshes or swamps. Then again, there are cyprinids which are essentially inhabitants of quiet pools of clear or murky water, or spring-fed lakes.

Some two thousand species of carp are widely distributed over Europe, Africa (excluding Malagasey) and most of Asia. They are absent, however (except in regions where they have been introduced by Man), from Australia, New Zealand, South America, southern Central America, northern Canada and Alaska, Greenland and Iceland.

The White Cloud Mountain minnow occurs in southern

China. It appears to be strictly local in its distribution. It seldom, if ever, exceeds a length of about an inch and a half and, owing to its small size and climatic heritage, is ideally suited to the home aquarium not wired up with all the electrical paraphernalia necessary to keep water at a special temperature. Furthermore, the fish has the added virtues of a most pleasing coloration, an active but non-aggressive nature, a good shape, and swims in all parts of the aquarium though it does tend to keep to the lower levels of the water most of the time.

Remembering what has been said above about its climatic heritage, it should come as no surprise to learn that it has a temperature tolerance of from about the low fifties (°F) in winter to the middle seventies (°F) in the summer. And here I must digress for a moment or two to interpolate a word of advice: any drastic change in temperature should be made very gradually over a week or two. To subject a White Cloud Mountain minnow—or any other species of fish (for that matter) to a temperature below or above that which it has been kept for many weeks or months before purchase is almost certain to result in trouble.

The formal name of the White Cloud Mountain minnow is *Tanichthys albonubes*. The species was given this scientific label by Lin Shu-Yin, head of the fishing research station of Canton, in 1932 (a memorable year: the year in which the diminutive cyprinid was made known to zoologists and aquarists in general and Hitler, not yet in the seat of power, informed the people of Munich that God

approved of his aim to change the world). But to get back to *T. albomides*.

The generic name incorporates the name of its finder, a young man called Tan, who came across the hitherto undiscovered little fish while exploring streams and pools at high elevation outside Canton. In everyday language, the technical appellation means 'Tan's fish from the White Cloud (Mountain)'.<sup>1</sup>

Soon after *T. albomides* was described in scientific journals published in China, it became a much sought-after fish among European and American aquarists. Curiously, J. J. Hoedeman, sometime curator of fishes at the University of Amsterdam, gives no indication in his *Naturalists' Guide to Fresh-Water Aquarium Fish* (Sterling Publishing Co. New York, 1974) when live specimens were first seen in the West. But we do know that sometime in the mid-1930s the late William T. Innes received some while he was residing at his home in Philadelphia, U.S.A. Apparently he acquired them through the efforts of his friend, a Dr. Oliver Eastman of Montreal.

But enough of history. The species was well-established in this country months before the outbreak of World War Two. It is hardly necessary to say that the fish was an instantaneous success; and even up to the present time it has lost none of its charms as an inmate of both interest and beauty for a community tank, that is, one given over to the smaller and inoffensive fishes.

Interestingly enough, a very young *T. albomides* looks almost indistinguishable from a neon tetra at its prime. The minuscule body displays two lines of red and green fluorescent-like light. But concomitant with the fry's increase in size, the colours tone down and new ones appear.

The back of a well-grown male is greenish brown shading down to a horizontal band of greenish gold which extends from the anterior part of the gill-covers to the root of the tail; and there it terminates in a black blotch. Below this band of greenish gold is another and broader band of brown to brownish red which gives way to pearly or creamy white underparts. Splashes of red colour fill areas of the dorsal and caudal fins. The anal fin is canary-bird yellow tipped with red. The ventrals are similarly marked. The pectorals are clear.

A female of similar age and length is fuller in the body, particularly in the region of the lower sides and abdomen and, in general, has a less vivid red coloration and more especially in her dorsal fin.

Feeding *T. albomides* is easy. It makes short work of any small live food such as Grindal worms, chopped white worms (*Enchytraeus albidus*), finely minced red garden worms, smallish *Daphnia*, and the like, and accepts, without hesitation and, indeed, with eagerness, crushed

flake or any other proprietary dried food. It is important to have a floor covering which does not permit particles of uneaten dried food to lodge unseen there and foul the bottom. Well-washed concreting sand (sharp river or pit sand) is recommended. If food is offered little and often rather than in generous pinches twice or thrice a day there is less risk of the fish not being able to cope with an excess of food and its attendant dangers: noxious gases and moulds. Though not necessarily essential, the installation of a good undergravel filter will see to it that uneaten particles of food are drawn under the compost and there changed by aerobic bacteria into harmless silt. In any case, a good undergravel filter will ensure crystal clear water.

Breeding the species is not difficult at all. A ripe female (denoted by her bloated sides) will scatter eggs every so often as she is driven about the aquarium by a colour-enriched and sexually excited male. The eggs come to rest among plants or among the interstices of the compost. The fry hatch within the space of about two days. That is if the temperature of the water is around the middle to upper sixties (°F) or beyond. Or put in another way, at a range of from about the middle sixties to the middle seventies (°F). As the female drops eggs at different times on different days—there are rest periods between driving—the fry from a spawning are always "all sizes". If the tank is well planted with aquatic vegetation such as *Eleocharis acicularis*, *Vesicularia dubyana*, and the like, there is really no need to worry about the parent fish eating many, if any, of the eggs or young provided live food or a favourite dried food is introduced every so often but not (as warned above) too often. Week-old fry stay cruising near the surface and are adept at vanishing from sight into tangles of greenery. Shallow water, say, about 7 in. deep is to the fry's advantage.

If it is the wish of the aquarist to save as many fry as possible, the brood fish should be placed over a non-toxic perforated or slatted mat the same length and width as the aquarium, and raised about two inches above the bottom. The eggs fall through the perforations or slats and are therefore safe from any unwelcome attentions on the part of the parent fish. After a couple of days, the parent fish should be removed from the spawning aquarium. Or before this time if any glass-splinter-like fry are seen moving in the water. Newly hatched fry usually start looking for food about four days after hatching out. For the first day after emerging from the egg they stay clinging to the sides of the aquarium or plants.

Drip-fed *infusoria* helps the fry to achieve rapid growth. Failing this, minute pinches of a proprietary dried food. Again, one can stir crumbs of the yolk of a hard-boiled egg into about a dessertspoonful of water and then feed the fry with well-spaced-out drops of the yellow infusion. A week or two later micro-worms or micro-cells, as well as powdered dried food, can be placed on the menu.



## *Hole in the Head Disease*

by Dr. Christopher Andrews of the  
Tetra Information Centre, and  
Mr. Peter Scott, a veterinary surgeon  
with an interest in fish diseases

A CONDITION TERMED 'hole-in-the-head disease' appears to be quite common amongst certain cichlids (e.g. discus, angelfish and oscars), and also some gouramis. Affected fish show very typical symptoms: small 'holes' appear in the body, especially in the head region, which gradually develop into deep craters. Very often a yellow, cheesy string of mucus will trail from the lesion, which leads some aquarists to believe that their fish are suffering from an unusual worm-like infestation.

### **Hexamita**

The actual cause of hole-in-the-head disease is in some doubt, although recent work has implicated the flagellate protozoan parasite, *Hexamita*. This parasite is in the same family as *Octomitus* and *Spiromucleus*, and the taxonomy of all three is somewhat confused. Whilst *Hexamita* is a relatively common parasite of fish, *Spiromucleus* is less frequently encountered (although it does occur in angelfish,

certain amphibians and some reptiles), and *Octomitus* has never been irrefutably established as a fish parasite. Nonetheless, the names *Hexamita* and *Octomitus* are sometimes interchanged (especially in older literature), and many of the early records of '*Octomitus*' probably refer to *Hexamita*.

All these parasites are rather small (around 5-20 microns in length), and certainly not visible to the naked eye. With the aid of a good microscope it is possible to detect their presence in infected fish tissues. They have flagellae which they use for locomotion, and they are extremely active in fresh preparations. In fish that have been dead for just a short while critical diagnosis of these parasites becomes difficult.

### **Low level infection**

*Hexamita* may exist as a low level infection in the

intestine of a large variety of fish, and such infestations probably do the fish little harm. However, under certain circumstances the parasites' numbers may increase markedly, which may adversely affect the fish. Fish suffering from heavy infestations of *Hexamita* in the intestine often go off their food, become listless and hollow bellied with yellow mucus in the intestine and pale 'stringy' faeces. *Hexamita salmonis* has been implicated in causing losses amongst small rainbow trout on fish farms.

However, in certain fish (e.g. cichlids such as discus, angelfish and oscars) the infection is thought to pass from the intestine into the internal organs of the fish, where the heart, blood and liver may become involved. Often the end result of such infestations is the development of the typical lesions in the head region, at the base of the fins, and near the lateral line.

There is also some information which suggests that *Hexamita* may affect the growth rate of angel fish and the hatchability of eggs from infected parents.

The factors which appear important in triggering off the disease include poor nutrition (especially inadequate vitamin levels), overcrowding, low dissolved oxygen levels, unhygienic conditions, or simply a change of diet or temperature, or a move to a different aquarium. Thus apparently healthy fish may carry the infection unnoticed for months, only for it to develop in the disease (or to infect other fish and thereby cause the disease) if environmental conditions change or deteriorate, or if the diet is inadequate.

#### Treatment

There are several alternative methods for treating fish to control *Hexamita*. On a large scale such as fish farms, where it may cause problems in small trout, furazolidone (e.g. Smith, Kline and French) may be added to the food, although this is rarely possible under normal aquarium conditions. Administration of any drug with the food to treat *Hexamita* is complicated by the fact that markedly affected individuals often lose their appetites. Fortunately, two drugs may be added to the water of the stock tank to treat this disease.

**Emtryle** (dimetridazole, May and Baker) may be used at a final concentration of 5mg/l (50mg/10 litres, 140mg/cubic foot) in the water of the tank containing the infected fish. This dose should be given three times at weekly intervals. Although this drug is said to inhibit spawning of some fish for a few weeks, diseased fish are unlikely to spawn anyway. It has been suggested that markedly diseased fish should be given a 48 hour bath in a solution of 40mg/l of Emtryl in a separate isolation tank. This method of treatment remains to be tested on a large scale.

An alternative, **Flagyl** (Metronidazole, May and Baker) may be used, although this method of treatment is said to inhibit (rather than eliminate) the infection.

Sufficient Flagyl should be added to the aquarium to give a final concentration of 7mg/l (71mg/10 litres, 200mg/cubic foot). One treatment is usually sufficient, although it may be repeated every other day for a maximum three applications. Flagyl can also be incorporated into the food (at 1% by weight), and fed for several days. This offers an excellent means of controlling *Hexamita*, although the problems of food medication on a small scale, and the loss of appetite of diseased fish, have been mentioned. Nonetheless, in the United States, Tetra market a medicated flaked food for ornamental fish, which contains metronidazole, and which has been very effective in eliminating *Hexamita* from fish which are still feeding. Unfortunately, this food is not available in the British Isles.

Furazolidone, dimetridazole (Emtryl) and Metronidazole (Flagyl) are only available on a veterinary prescription in the British Isles, and your local vet (see 'Yellow Pages') should be able to advise on the calculation of the correct dose levels. (When adding drugs to aquarium water it is important to dissolve the chemical in a little water from the tank, and then evenly disperse this throughout the bulk of the remaining water).

Although both of the aforementioned drugs have been used successfully and safely on many occasions, it is important to realise that neither is licenced specifically for use with fish, and hence any aquarists using them do so at their own risks.

#### Prevention

The introduction of *Hexamita* into stock tanks may be prevented by the quarantine of all new fish, and the administration of a preventative course of treatment to fish such as discus, angel fish and oscars. Other species of fish may also carry the infection, and act as a source of the disease for more susceptible species.

As a result of the importance of adverse environmental conditions and poor nutrition in activating otherwise latent infections, the value of good husbandry cannot be overstated. Overcrowding must be avoided, and regular partial water changes carried out (including the removal of any accumulated debris). Similarly, temperature and other water conditions must be maintained at an optimum for the fish in question, and a good, varied diet provided. High quality flaked, tablet or pelleted foods should be used to form the basis of a balanced diet. The vitamin content of fresh foods (such as raw beef, beef heart, etc.) may be increased by rolling each piece of meat in a staple diet flake food immediately prior to feeding.

In order to assess the importance of hole-in-the-head disease as a disease of aquarium fish, aquarists are requested to send any information they have concerning outbreaks amongst their fish to the Tetra Information Centre, 15 Newlay Lane Place, Leeds LS13 2BB.

THE GOVERNMENT'S Wildlife and Countryside Bill does not seem to protect sufficient areas of special scientific interest. In the past 130 years, Britain has lost 87% of its lowland bogs, the haunt of marsh-gentians (like Holyhead's Bodfor or Bodafar, and Libedgoch heath, in Anglesey), grass-snakes and amphibians. Since 1960, Dorset has lost 42% of its heathlands, haunts of smooth snakes and the Dorset heath, largely the result of agricultural development.

#### Early frog-spawning

Last year ended on a mild, if wet weather record and our editor told me that on November 25th he found a pair of common frogs in amplexus (mating) in his garden pond in Sussex, the previous "earliest" having been in January. They seem to mate earliest on elevated southern areas like Dartmoor. Frog-spawn has been found at Widecombe-in-the-Moor near there by January 16, but in Northumberland first frogspawn is sometimes killed by frost.

Sexing fish is an early problem with young fish-keepers, so imagine the anxiety of a Shrewsbury pet-dealer fined £40 plus costs last December for selling a customer a pair of orandas which proved to be both female. It's not easy to sex these fancy goldfish until they are large, and many dealers sell small ones unsexed. Sexing is easier in spring when males may develop small pimply tubercles on gill-covered and pectoral fins, and females look plumper from above. Males also chase females more than. Females very rarely develop tubercles. At all seasons the male usually has a thicker first ray in his pectoral fin.

#### Herpetology

A one day introduction to Herpetology course organised by the Association for the Study of Reptilia & Amphibia, at the Wildfowl Trust, Washington, Tyne & Wear, on March 28, ranges from classification and conservation to evolution, vivarium-construction, handling and common ailments. The chairman of ASRA John Coburn, invites suggestions for papers to be read at the International Herpetological Congress planned for October 3 to 9 at Oxford University Zoology Department. It will cover captivity and breeding, conservation and field research.

Maybe too trivial for their deliberations is the way the modern menace of off-the-road scramble motor-cycling is benefiting snakes. In California's desert, kangaroo-rats used to be able to hear rattlesnakes sneak up 3 feet away, but after exposure to the sounds of a motor-cycle race for 8 minutes, the rats could not hear the snake until it was 3 inches away, and too late. They should be more concerned for Culebrita in a small cluster of the Culebra Islands in the blue Caribbean Sea, a Puerto Rico refuge for sea-turtles, the rare and declining hawksbill, green, leatherback and loggerhead species. After long use by the U.S. Navy for practice firing, the islands were nominally succeeded to conservation; but the turtles were driven from one beach after another and public recreation now threatens the last of their breeding grounds, on Culebrita.

#### Scallops

Marine aquarists will find a little about culturing, like the



## From a Naturalist's Notebook

by Eric Hardy

big Japanese or Pacific scallop, in the new 19 page Laboratory Leaflet 5, *The Scallop in England & Wales* by Franklin, Pickett and Connor, sent to me by the MAFF's Lowestoft research labs and available from HMSO. Though dealing much with the fishery, which is mainly off South Devon and the Isle of Man, it illustrates artificial spat-collectors made of plastic netting stuffed inside rigid netting bags so that water, bearing the spat, can pass through in summer. The spat settle inside, where they grow to 10-20 cm by October when the bags are retrieved. Queen spat is usually more numerous than common scallop to collect and grow. Experiments are also proceeding on the production of spat in hatcheries, similar to methods used with oysters. Such spat is then grown on trays; but our relatively cold waters may be restricting.

If you find it difficult to get to know of these rather limited publications, it is more difficult to keep pace with special articles or "papers" in scientific journals, unless you belong to a technical library. The British Museum has issued a 7-page list of titles available on Fishes, which appeared in its Bulletin over the past 30 years. They range in price from £1.45 for a revision of Lake Victoria's *Haplochromis* to £55 for 40 drawings of fishes by artists accompanying Captain Cook, and include ocean sunfishes by A. Fraser-Brunner, a former editor of *The Aquarist*, to

new *Tilapia*, cichlids, cyprinids, angelfish, catfish and *Barrus*. Though headed "Fishes," the list includes land-snails and corals.

Equally helpful is the new 510 page *Natural History Manuscript Resources of the British Isles*, published by Mansell at £97. It goes back to 1600, has a list of nearly 450 repositories and an annotated bibliography, and include unpublished material, lecture-notes, sketches, trade and business records, etc.

### Salmon

The flooding rains of 1980 urged many more salmon and sea-trout up the rivers of western Britain than ascended in dry seasons like 1976. Continuing through autumn, high rivers enabled them to spread out among the spawning tributaries; but this is only a small stage in the conservation of our most noble of British fishes. At sea, grilse and older salmon which go north to the Arctic Ocean to mature instead of across the Atlantic to the Greenland Sea, are facing the increasing salmon-fishery around the Faroe Islands where they feed, which in 1980 exceeded 500 tonnes against an average under 20 tonnes in the previous decade. The Atlantic Salmon Trust became concerned because no stocks of this migratory fish can stand such an increase. The NE Atlantic Commission's ban on fishing for salmon on the high seas formerly covered the Faroe Seas.

The risk of the EEC opening Britain's 12 miles of coastal waters to other countries would endanger our salmon-stocks, because only Britain, Ireland and France among EEC countries have major salmon-stocks and a concern for their conservation against their increasing market value and commercial demand.

Will the increased "ranching" of cargo-reared salmon make a major contribution to salmon-conservation? Marine Harvest, which started in Scotland over a decade ago, are now the largest British salmon-farmers, with an increasing export trade of "Lochinvar" fish to the continent. But salmon-ranching is taking place in Ireland, Alaska, Russia, U.S.A., Japan, Canada, South America and New Zealand, often with the intensive use of streams like Canada's \$300 million programme to boost British Columbia's output, and the Pacific Ocean. Hatchery-reared smolts now maintain almost the entire Baltic salmon-fishery. British Columbia plans to double the annual crop from its rivers, already worth 1 billion dollars a year.

Extensive salmon-transplanting has taken place in Russia, New Zealand, Newfoundland and South America. Some control has been effected over illegal salmon-netting at sea off western Ireland, but the position is different from the need to conserve over-fished herring English Channel bass and mackerel stocks, lobsters and Nephrops, as their breeding grounds remain relatively unharmed for an eventual recovery. Interest in salmon-conservation is not the monopoly of anglers. Salmon are part of our native fauna, yet few county conservation trusts spouting up and down the country about flowers and birds and otters and badgers whenever they can get a titled aristocratic or failing that, a retired colonel, late Indian Army, to open and close their meetings, ever murmur a word about a right-of-way for

salmon coming up our rivers to spawn. Compared with anglers, their record in combating river-pollution is dismal.

Salmon-watching at a salmon-leap, like the Lledr gorge between Bettws-y-Coed and Pont-y-Pant or the biggest leap of all, nearly 12ft at Orrin Falls, Ross, or a spawning-bed like Paythorne Bridge in the old Yorkshire Pennines, is just as fascinating as bird-watching. Even a visit to one of the mechanical counters on a salmon-run, or the Pitlochry (Faskally) research laboratory and their public viewing tanks at the falls. An aquarists club can have a most interesting outing on the first November frosts to a salmon-hock or trap to see fish caught and stripped of eggs. Then to the hatchery in spring as the young hatched fish are released in the upper reaches of rivers, would be a great influence in arousing public interest in salmon-conservation. One of the reasons for the massive public interest in bird-conservation is the long run of entertaining colour films on TV or by the RSPB. The majority of the RSPB's enormous and wealthy following are essentially armchair or garden bird-watchers, either before a TV set or motoring to a comfortable hide at a bird-reserve where birds await them. Only a minority wears weekend wellingtons in monthly duck-counts or wader-surveys, or shares any wider interest in the ecology which makes their bird-watching possible.

### Conservation

Naturally, the bulk of aquarist club-members are mainly interested in fish-shows. This is a healthy interest in fish species, which otherwise might not be there; but it is difficult to obtain information about the conservation of many tropicals in their native haunts, except through the U.S.A. There, some conservationists are taking a catastrophic view that by the year 2000, 15 to 20% of the world's plants and animals will be extinct—over half-a-million species. 40% of forestland will have gone and deserts will have expanded almost 20%. The world's water-supplies and wetlands will have declined 35% and some 50% increase in human population will put its pressure upon the remainder. This, at any rate, was the recent gloomy view not only of a Washington official of the Audubon Society, of which I am a member, but of a U.S. government report to the president, using computer-based information. At the least it may lead to some action. Here?

## Buyer's Guide

(Published Quarterly)

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# Commentary

by  
**ROY PINKS**

AT ABOUT THIS time last year I was struggling with the intricacies of constructing a decorative cabinet for two of my aquaria, on the lines of those which have become commercially available. The latter, excellent though they generally seem to be, are considerably over-priced, taking into account the cheapness of conti-board, and most designs incorporate a sloping top, which is an infuriating feature for one who likes to stand house plants on top of almost anything which will accommodate them. Furthermore, the lighting arrangements usually mean that only one or two fluorescent tubes can be employed, and few have switching facilities to suit my wish for maximum flexibility. In a future article I will give details of the unit I built. It was far from perfect as an example of either engineering or woodworking craft, but it did turn out to be a real improvement on an elementary panelled affair which had enclosed my tanks for well over ten years.

## Plant growth

One of the difficulties I anticipated was that of getting the plants to grow. It was bad enough as it was—the tanks had to face east, they got little direct light, and the boxed-in sides of the new cabinet would exclude the late afternoon sunlight which had hitherto helped things along. Another factor affecting plant growth, which I certainly did not properly allow for, was an increase in tank depth from 15 in. to 18 in. On paper, this does not sound like an alarming circumstance, but it turned out to be a perfect nuisance, and I am still trying to overcome the worst side effects.

However, the requirement which I primarily addressed was that of getting the right quality and quantity of light to the plants. Like many other aquarists I have, over the years, managed to cope with most species of fish and have brought on some fine specimens, but tank plants have never flourished, other than the cryptocorynes, whose preferences were very much in line with the indifferent daylight levels which were available. I did console myself that these plants were pretty good, but even they pro-

tested and died back from time to time after repeated chemical attack following outbreaks of white spot amongst the fish. So when I embarked on building the new cabinet I promised that lighting would be a major consideration.

## Lighting

The extent of the difficulty may be seen by comparing the difference in effect by suspending a fluorescent tube over a tank, say, 10 in. deep, and the same tube over one of twice that depth. The penetration of depth falls off sharply in the latter case, and as it is the emergent plant shoots which need maximum light for proper growth, failure is likely if extra depth is not compensated for by enhanced overhead illumination. Though there are probably some formulae for this, in practice you really need to experiment somewhat in order to get the most pleasing results, hence the inner roof area of your cabinet should be dedicated almost entirely to facilities for light fittings, with switches preferably located on the sides, either inside or outside, to suit one's taste.

Though I think I have not yet got it right, I have three fluorescent tubes and one tungsten tube, and these enable me to have one set of lighting during the day and a different one during the evening. Over the year there has been something of an improvement in plant behaviour: my own lack of conscientiousness during the summer season probably contributed to some backward steps now and again, but these are features we writers must try to tackle because few aquarists are so fanatical and correct that such peccadilloes as I have indulged in should be regarded as being in any way unusual or badly negligent.

## Advice rejected

Certainly I rejected one piece of advice I was given, which was that only something like Tru Lite would do the job. I have consistently criticised the lamp making trade for their ridiculous pricing policy, and will have none of any routine ancillary which costs as much as, or more than, one's very tank. As the trade has always remained silent on the matter I can only assume that it is lacking in justification and too ashamed to attempt a reply. Seen against the cost of £1 for a six foot fluorescent tube in many High Street shops, the case for the astronomical prices of the more specialised ones would have to be carefully thought out to bear any credence.

A further example of the arrogance of the lamp trade was evidenced when I was trying out the tungsten tubes. I bought a number of 30W and 60W B.E.L.L. (British Electric Lamps Ltd) striplight tubes, at well over a pound each. The higher wattage units were too strong, and I settled for one 30W in that fitting. Within two months I had replaced four of these, and as they were only lit for about four hours in the evening I complained to the retailer. He was unimpressed and told me to write to the supplier, who commented that the small fraction of total

failures was usually associated with fish tanks: that lack of ventilation, current surge (1), excess condensation etc often results in a life below the norm of 1,000 hours. The firm refused to pay postage for an examination of the tubes, but said that if I sent the faulty ones and they were found to be below par, these would be replaced. It is hardly worth bothering to continue correspondence when firms make such wrong assumptions, so I passed on to try Mazda and Winfield tubes. I have not even got as far as the latter, as the one Mazda inserted in April is still doing well, despite being in use for about 15 hours a day! To complete the facts, there is no condensation in the light

chamber whatever—it is well above the close fitting cover glass of the tank, the whole of this is well ventilated, and the ambient temperature is about 80°F during the day. I will leave the reader to form his own opinion.

I will also leave him with another thought. The advertising surrounding tubes and lights is numerous and fulsome. Now, have you ever seen in the thousands of dealers who sell them, long-standing planted aquaria which in any way substantiate the makers' claims? On reflection, I have only ever seen one, and this was over 10 years ago. Otherwise, in general, they tend to look as bad or even worse than mine. So what, I wonder, is the real answer?

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## Siamese Fighters—Part II

by Martin G. Briscoe

OUR MALE and female fighters had now been in empty pickle jars for three months before being transferred to a sectioned off tank on their own. They became very apprehensive of their surroundings and you could almost say "distressed". However, when replaced into their jars they seemed to breathe a sigh of relief and say "now we are back where we belong". It can thus be concluded that if these fish grow up in a jar of the size suggested, they are in no way distressed and nothing detrimental happens to them—they would be good pets to have in centrally heated flats where no individual heating would be needed for them. On the other hand a tank bred fighter which had always lived in larger surroundings, could not settle to life in a jar as we discovered on numerous occasions.

I have now made individual tanks of all glass 9 in. high and 6 in. square in which my fish live. These small tanks hold approximately one gallon of water and could be made to look in keeping with their surroundings, e.g. living room, etc. and the fish are happy provided they have been bred and have grown and developed in such a tank or jar. They seem to be happiest if they are cleaned out twice a week and their water replaced with water of a similar temperature. They become comparatively intelligent regarding their feed time and will take food from my finger tips. I have not placed any gravel or plants in these tanks as yet but will further my experimentation regarding this in the near future. The tanks are filled to about 2 in. from the top with water which we consider to be adequate if the fish are to be kept purely as pets. Indeed, during the summer months if these tanks, half filled with water, were in a warm part of the room and heated simply by the sun, the fighters started nest building. The only drawback to this size tank for breeding purposes it seems, is the difficulty

in removing the female once her role is completed, without breaking the nest, so I will experiment by leaving both parents in the tank and hope for the best—I will comment further on this experimentation at a later date.

Our experiences with blue fighters show that they are much slower in their breeding habits and females appear to find them almost ugly facially but not in their finnage, which is often magnificent. We have found that females placed with blue males are quite reluctant to "perform" but will spawn readily when placed with a red or pink fighter. One of our blue fighters seemed to prefer the semi-darkness and on leaving the curtains drawn one morning whilst we were out, we returned to find a fine nest built and eggs laid. These eggs were unfortunately lost as the male seemed to lose interest and deserted his nest. Once this had happened the female blitzed the nest completely. We removed both fish and replaced them with our old faithful red fighter and his mate. These two spawned happily and successfully. Once again the eggs from the wrecked nest had fallen to the bottom of the tank. Some hatched and we raised one blue female to maturity. We are now hoping that she will take to the red male we have chosen for her. He has a slight blue fleck and who knows, we may yet raise some solid blue fighters.

After purchasing *nabifex* or blood worms these are now thoroughly washed by allowing cold water to run over them for a period of at least 48 hours to remove any "nasties". and then before feeding a portion is removed and treated with methylene blue for about 15 minutes. It is then flushed with clear water and introduced to the tanks from where the fish eagerly take it. We have found this helps their resistance to disease.



The fifth annual I.R.S. Open Show held at the 4th Enfield Group Scout Headquarters. Row upon row of tanks containing good quality Ranchu. (Photo: Frank Russell)

An international flavour to

## The Ichiban Ranchu Society Open Show 1980



The Ichiban Ranchu Society held their fifth Open Show on the 18th October last at the new headquarters in Enfield. The Show was an outstanding success with a record number of entries including fish entered by members in Japan and the U.S.A., giving the Show a truly international atmosphere. For the first time the Society had on sale specialist foods for the Ranchu imported by them from America and Japan. Also in attendance were Marples Bonsai who staged an impressive display of Bonsai trees which attracted much attention.

The Society, formed five years ago, is the only one of its kind in the West devoted exclusively to breeding one variety of fancy Goldfish, namely the Japanese Ranchu, and is associated to the Doko Kai of Japan. (The Ranchu should not be confused with the Chinese Lionhead or the English Bramblehead which was developed from it.) Since the Society's inception, interest in the Ranchu has grown to such an extent that the number of fish entered this year totalled nearly 200. The quality of Ranchu has also steadily improved, with over 70% of this year's exhibits being owner-bred.



The Society's President, Mr. Jim Davidson, presented cups and shields to all class winners together with the seven magnificent perpetual trophies for special awards. These are awarded for owner-bred fish in all classes except adults, for which the Society is introducing a further perpetual trophy next year.

The full awards were as follows:

<b>Class A Tozai (1st Year)</b>	<b>Class B 2nd Year</b>
1st Mrs. P. Tagg	1st G. Lewis
2nd G. Lewis	2nd Mrs. P. Tagg
3rd Mrs. P. Tagg	3rd J. Parker
4th Mrs. P. Tagg	4th G. Lewis
<b>Class C Adults</b>	<b>Class D E F Edonishiki</b>
1st B. Lumley	1st A. Lawman
2nd G. Lewis	2nd A. Hilton
3rd Mrs. P. Tagg	3rd A. Lawman
4th J. Davidson	4th Mrs. E. Davidson

#### Perpetual Trophies

I.R.S. Best In Show .. ..	B. Lumley
Stanley Gover Cup .. ..	B. Lumley
Joe Porter Memorial Cup ..	Mrs. P. Tagg
Tozai Challenge Shield .. ..	Mrs. P. Tagg
G. Lewis Shield .. ..	G. Lewis
Junior Shield .. ..	A. Hilton
Marguerite Hilton Rose Bowl ..	Mrs. P. Tagg
Aquarist Gold Pin .. ..	B. Lumley

Anyone interested in further information on the Ranchu or the Society's activities should contact Mrs. E. Davidson, General Secretary, The Ichiban Ranchu Society, 14 Garnetts, Takeley, Nr. Bishops Stortford, Herts. CM22 6RJ.

1st Class C Adults owned by Brian Lumley.  
(Photo: Keith Waters)



# Plant Profile No. 1

## *Crinum natans*

by  
B. Whiteside

I HOPE to make this the first article in an occasional series in which I'll attempt to introduce to readers some of the various aquarium plants that I've enjoyed keeping—or attempting to keep. Regular readers will already know that I enjoy keeping and growing plants just as much as fishes. Those who have attempted to keep many different species of plants and fishes will already know that in many cases it is easier to succeed with certain 'difficult' species

of fishes than it is to cultivate successfully many of the less common species of plants.

I keep all my fishes in planted tanks because I think that the presence of plants enhances the look of the fishes and the aquarium; and most species of fishes seem more content when kept in an environment containing growing plants.

When plants and fishes are to be kept in the same tank, one must basically provide the conditions that best suit the fishes; and then attempt to select plants that should also survive in such conditions. The plant specialist who cultivates only plants in his tanks can obviously ignore the needs of fishes and attempt to provide conditions that are ideal for any given plants; thus he may be more successful in cultivating the more 'difficult' species of plants.

I should like to begin the series by introducing to you a plant that I first came across only recently—*Crinum natans*. The fact that it does not yet have a common name, allied with the fact that the plant is fairly rare and still somewhat expensive, may account for its not yet being as popular as I feel it deserves to be.

I first read about the species in Rataj and Horeman's excellent book, *Aquarium Plants—their identification, cultivation and ecology* (T.F.H. Publications, Inc., 1977). The information and photograph contained in that book led me to search through some of the advertisements in this magazine until I found that plants could be obtained, price £1.10 each, from at least one specialist plant grower.

*Crinum natans* belongs to the *Amaryllidaceae* family—as do some common garden plants, such as daffodils and  
*Continued on page 42*



# Lutjanus argentimaculatus

by  
*William Ross*



*L. argentimaculatus*  
photo P. W. Stroud

QUEEN HATSEPSUT who reigned in Egypt in the 18th Dynasty (1580-1085 B.C.) is reputed to have been the first reigning monarch to have ordered and financed a detailed natural history study of the Red Sea. On many of the tomb walls in the Valley of the Kings at Luxor are coloured engravings of reptiles, animals, aquatic birds and fish. One very fine example of this is found on a Noble Man's tomb at Thebes. Some time during the 5th Dynasty (2600-2190 B.C.) a tomb was prepared at Sakkara for the daughter of King Unis. On the walls of this tomb are

some beautiful coloured engravings of fish; one of these is quite obviously of a large cichlid. From these very early beginnings man has continued to collect and document the living creatures of this world. In this day and age, places such as the British Museum (Natural History), Amsterdam University Museum, Los Angeles Museum and many others have replaced the paintings on the walls by becoming great storehouses for preserved specimens, maintaining records, books and scientific papers pertaining to the natural history of the world. The dedicated and



Irrigation ditch at Qatif oasis where a number of *L. argentimaculatus* were caught.

highly skilled staffs of these museums spare no effort to furnish answers to questions passed to them by the enquiring public. It is through the efforts of Mr. Jimmy Chambers of the British Museum (Natural History) that I now find myself in a position to identify and write about the fish in this article. I am deeply indebted to Jimmy for conferring with Dr. Camm Swift of the Los Angeles Museum and for his correspondence with Dr. Gerald Allan of Perth Museum, Australia.

**Lutjanidae:** 250-300 species comprise this family of active predatory fish. Their diet consists mostly of small fish, crustacea and some browse on algae. Widely distributed throughout the warm seas of the world, the majority being found on coral reefs, a few in tidal pools and lagoons, some in brackish waters near

Engraving of a large Cichlid on the wall of a tomb at Sakkara, Egypt.

March, 1981

mangroves and at least one specimen, *Lutjanus argentimaculatus* is found living in fresh water having ascended rivers from the sea. A few species are poisonous but generally speaking snappers make excellent eating, being fished commercially in some Countries.

*Lutjanus argentimaculatus* (Forsk. 1775) is a large predatory member of the snapper family growing to 90 cms. It has an almost triangular shaped head with a large mouth containing canine like teeth in both jaws. Most of the face and opercula are covered with small scales, a pair of large eyes with irregular but symmetrical pupils and two nostril openings in front of each eye. Body is high and compressed with a continuous dorsal fin; the first 9 rays are well developed spiny rays, the remaining 15-16 are soft rays. Anal fin has 3 spiny and 9 soft rays. Pectorals are large and pointed; caudal is truncate. The colour of this fish is variable depending on mood; it changes colour rapidly from almost black through shades of dark brown to a light greyish brown. In a settled mood it is a rich dark brown with an off-white patch on its head and 8 broken transverse stripes of the same colour on its body and caudal peduncle. Two beautiful blue lines run from the mouth, under the eye, to terminate at the beginning of the opercula. Pectoral, dorsal and caudal fins are clear, sometimes tinged with blue. Pelvic fins brown, anal brown at base becoming clear at the edge. Most pictures and drawings I have seen of this fish depict it as a reddish brown fish, I believe this is due to a dead specimen having been used, for one fish that I had died and turned this rusty colour.

My introduction to *Lutjanus argentimaculatus* was on my arrival in Saudi Arabia in September, 1977. I was shown a fish which was thought to be a member of the cichlid family by its owner. This fish apparently had been caught in a fresh water stream which runs into the sea at Azizia oasis. This is a small coastal oasis close to the town of Al-Khobar, in the eastern province of Saudi Arabia. Terry Leitherland, the owner, was shortly to depart from Saudi and I felt heir to "Jaws". This is the name the little monster had become known by because of its large mouth containing teeth and its ability to swallow a fish of almost its own length.

Over the past two years I have had the good fortune to



collect quite a number of these snappers from 6 cms.—25 cms. Some of them have been collected from Azizia but the majority from Qatif which is a much larger oasis further along the Arabian coast towards Kuwait. At Qatif these fish have swum up the streams from the sea and have taken up residence in the irrigation ditches of the plantations some of which are approximately 2 miles inland. The main source of food for these predators is the large shoals of Arabian Killifish (*Aphanius dispar*—Ruppel 1828) which inhabit these ditches.

I believe *Lutjanus argentimaculatus* can be found on sale in the United Kingdom under the name of Red Snapper; this is a name I personally dislike as it is used for quite a number of different snappers. For the aquarist who has the space and desires a specimen fish I can recommend *Lutjanus argentimaculatus* or *Sbetti* as it is known locally. A spacious aquarium with some form of aeration is a necessity. I have used undergravel filters and sponge filters with similar success but my preference is for undergravel filters with this fish. Small specimens of 6 cms. may live happily together at first but I have found they settle down to aquarium life more readily when there are 3 or 4 of them together. Unfortunately, this life of bliss soon comes to an end and they become very aggressive. If not separated at this stage one fish will eventually kill off its companions. I have observed them locking jaws, at first I thought, in preparation for spawning but now know this is only part of their fighting nature. In a very short time the most aggressive specimen can reduce a fish of similar size to a battered and torn corpse. Once they have been separated I have never managed to re-introduce these fish to each other successfully. As decoration in my aquaria I have used large, strong Amazon Sword plants where sponge filters are used; in under gravel filtered tanks I use plant pots as caves. These fish display a great deal of cichlidian type behaviour. They excavate large depressions by moving mouthfuls of gravel from one spot to another. On many occasions I have observed them tearing pieces off my plants.

Feeding this snapper is not too difficult. At first I feed them on small *Aphanius dispar* which I can collect fairly easily. Small pieces of meat, chicken and fish are readily accepted once they have settled into captivity. I have tried freeze dried *tubifex* worms and pellet fish food with little success. On a varied diet these fish grow rapidly. They remain shy when approached too closely, hiding behind plants and any other decoration, watching everything with their large eyes. Over the two years that I have had the privilege to catch and care for these fish in aquaria I have found them to be hardy and easy to keep. Large specimens 25 cms. are more difficult as they do not settle into captivity easily. If one can purchase marine specimens it is worth remembering that with patience they can be acclimatised to brackish water and then to fresh water.

We are indebted to a very good friend, Peter Stroud, for his help and assistance with the preparation of the photographs which accompany this article.

#### Plant Profile—Continued from page 39

snowdrops. It is native to areas such as Ghana, Thailand and Nigeria, and usually grows in fairly deep water—as its long leaves suggest. This species grows from a bulb—of about 2-3 in. in diameter—that looks very like a daffodil bulb (see photograph).

I purchased a plant some months ago and planted it in a 30 in. × 15 in. × 15 in. aquarium, with a variety of other species of plants. Photograph 2 shows my plant as it was received from the supplier. I placed it in a 10 in. deep tank that I use for photographic purposes; but, as you can see, I made no effort to plant the bulb in the gravel for the photograph because the plant was much too tall for the tank in question. I simply placed it on the gravel and used a small stone on its roots to hold it in place while I took my photographs. Notice the several thick, sturdy roots on the plant—as well as the many more numerous feeding roots. I may be wrong but I suspect that the sturdier roots may be intended to pull the bulb down into the rooting medium where it may be held with its base just on or slightly beneath the surface so that the feeding roots may penetrate the medium and seek out nutrients.

My 30 in. long tank has a base of crushed granite chippings. No additional feeding was added to the gravel; but it contains the waste materials that have gathered there during the ten or more years since I set up the tank. The tank is lighted by three 40 watt bulbs for about six hours daily and receives no natural light. The water in the tank has a pH of 6.4 and is fairly hard; it's kept at a temperature of 75-79°F and is filtered by an outside power filter that keeps the water crystal clear.

These conditions seem to suit the plant very well. The size of the bulb has diminished somewhat—which is normal when bulbs are in full growth—and the plant carries eight beautiful, light green leaves that are about  $\frac{1}{2}$  in. wide and well over 3 ft. in length. The leaves are very slightly twisted and, as you can imagine, a large proportion of each leaf floats on or just beneath the surface of the water.

If you have a tank that's at least 12-15 in. deep I can thoroughly recommend this beautiful and interesting species. *Crinum natans* seems to be very easy to grow; it likes a fairly bright light; and the contrasts of the plant's various parts—its whitish-brown bulb, the greenish stalks of its leaves, and the pale green leaf blades that swirl around the top of the tank just under the water surface—make it an extremely beautiful and attractive plant that should enhance any larger aquarium. Naturally, its very long leaves slightly shade parts of the base of the aquarium; but this causes no problems.

If you like aquarium plants I suggest you spend 110 pence on a *Crinum natans*. I think it's cheap at the price—and I don't think you'll be disappointed.

# Meet the Aquarist

No. 7

Colin Clarke



MY NAME IS Colin Clarke, I'm 34 years of age, married with a 4½-year-old daughter and am a warehouse foreman with Marks and Spencer.

Shortly after moving into our present house in Hillingdon some 5 years ago, we discovered that we were living opposite an old friend who is a keen aquarist. He had several tanks in his lounge and we were so impressed that we wanted one of our own. With his help we set up our first aquarium, keeping fairly hardy fish moderately easy to look after, such as guppies, platies, etc. Of course, we were soon bitten by the bug and our one tank was quickly joined by another and another until it became more and more difficult to find somewhere to sit down. At this point we decided that a fish-house would be the answer. We thought a garden shed would be ideal, but quickly changed our minds and decided to convert part of the garage. It had windows and a side door as well as an up-and-over door and with a partition across the middle it was perfect. No room for the car, mind you, but plenty of room for tanks!

Insulation was one of my main considerations. I began by cementing in every nook and cranny where heat might escape and then gave the interior walls three coats of Aquaprufe to help keep out the damp. I put in a false ceiling of chipboard and hardboard with a layer of polystyrene in between, the walls were done in a similar way with a wooden framework packed with polystyrene. Finally I covered the walls with hardboard and a coat of paint, leaving one window free to allow for a certain amount of natural light. Next came the fitting of the electrical supply and I must admit this is not one of my strong points. A neighbour kindly helped me run a power cable to the fish-house and from this I ran an 8 ft. double fluorescent light, air pumps and a thermostatically con-

trolled fan-heater. The overall size of the fish-house is 9 ft. x 9 ft. and accommodates 10 tanks, sizes being:

4—36 in. x 18 in. x 15 in.; 1—36 in. x 15 in. x 12 in.; 3—24 in. x 15 in. x 12 in.; 2—24 in. x 12 in. x 12 in.

I like to do 50% water changes at least once a week and for this purpose have placed two 37 gallon water butts inside the fish-house which are kept full up so that water can age and reach the correct temperature.

My personal feelings as an aquarist are that I need a goal to aim for and my way of achieving this is by breeding my stock of fish and bringing the fry up to show size as showing is my main interest. The fish I keep are all livebearers and include *Xenotoca eiseni*, *Ameca splendens*, *Poecilia melanogaster*, *Xiphophorus variatus*, *Poecilia reticulata*, *Heterandria bimaculata*, *Dermogenys pusillus*.

I believe in feeding as much live food as possible and give *Tabifex*, bloodworms, *Daphnia*, mosquito larvae, and chopped earth-worms and also beef heart. I try to introduce as much variety as possible into their diet, feeding flake in the morning and live food in the evening. My tanks are kept between 78°-80°F and the lights are kept on at least 12 hours a day, mainly for the plants.

I am a member of the Uxbridge and District Aquarist Society and am at present Show Secretary. My first attempt at showing was at the club and resulted in Best fish in the show and since then I have won quite a few cups and trophies at open shows. We recently held an inter-club evening for which I devised a fish crossword competition which was quite successful. I am also editor of our club magazine called 'Club News' which we publish quarterly. The Society meets fortnightly and organises social events at Christmas and throughout the year. The club gives an ideal opportunity for people of all ages to share in one common interest.



## New Organizer for the British Aquarists Festival

Barry Durham talks to David Sands on  
behalf of "The Aquarist and Pondkeeper"



David Sands

THE 1981 British Aquarists' Festival will be something special.

It is 30 years since the event began as part of the Festival of Britain celebrations, and the traditions that have brought the show to this special 'pearl' anniversary are foremost in the minds of the new organizing committee led by David Sands.

David was voted in as B.A.F. Organizer elect at the December Council meeting of the Federation of Northern Aquarium Societies and takes over his post officially in March when the resignation of the previous organizer takes effect.

Not content to rest on his laurels in the meantime however, David has gathered around him a new and hard-working committee who have already come up with a number of ideas and innovations at their meetings which should turn this year's festival into one to remember.

In a special interview for *The Aquarist and Pondkeeper*, David outlines some of his plans, hopes and visions for B.A.F. 1981—and beyond.

*The Aquarist and Pondkeeper:* The British Aquarists' Festival has been run for many years by the same few people who obviously had a lot of experience in presenting their event. What do you now hope to bring to the Festival?

*David Sands:* Basically we are taking a fresh look and making a fresh appraisal of the event. I have a committee of people who are not afraid to take on delegated jobs—and do them. This should make the organization a more open progress.

The temptation is always there to tread along the well-worn path because that is the safe way, but we live in

changing times and the tastes and requirements of people involved in our hobby are changing.

It is not going to be all new however. There must be some continuity and I will seek help and advice from some of the hardworking people who have been involved in the past and I hope the societies themselves will take a fresh look at their role in the Festival.

*Aquarist:* The venue of the show at Belle Vue has come in for quite a bit of criticism in the last few years, especially since the zoo, and now the funfair has closed. Do you think that Belle Vue is still the best place to hold B.A.F.?

*David:* Due to the uncertain future hanging over the Belle Vue complex we must be better off looking for an alternative while we still have an option. It now seems obvious that we would need a new venue for 1982 in any event.

My committee has looked at an alternative venue at Norcalympia at Blackpool and the traders have also been invited to look the hall over and give their views on it. It is smaller than Belle Vue, but the whole of the hall there was not used. If we use the square footage at Norcalympia to its fullest we can have a more compact and friendlier show which will have more variation and attractions than previously.

*Aquarist:* It has been said that there are too many classes at the Festival. The numerous pairs classes which attract only one or two entries are one example. Do you intend to make any changes in that direction?

*David:* I have asked Roy Johnson, the new chairman of the F.N.A.S. Judges and Standards Committee to

look into this one for me. I am sure there will be revisions and as soon as a decision is made we will let everyone know.

*Aquarist:* Several years ago there were judges from many regional federations officiating at B.A.F. and last year there were two judges from the F.B.A.S. Do you intend to continue this practice?

*David:* I have made a recommendation to the Judges and Standards Committee that they look for judges from other federations.

I do think it is a good thing to have judges from other associations taking part in the festival as this helps to make it truly nationwide. I hope it will mean us taking the lead towards a full and open exchange of judges.

I would also like to see a rota of F.N.A.S. 'A' class judges drawn up so that they all get a chance to judge at B.A.F. every two years or so.

*Aquarist:* One criticism of the show is that only the richer clubs can now afford to enter because of the cost of building a tableau. Do we really need the tableaux to exhibit the fish in?

*David:* The tableaux are an accepted part of the British Aquarist Festival. They make it stand out from an ordinary open show. The committee would like to see a reasonable across-the-board contribution to all participating clubs to help offset the cost of building a tableau.

The question of exhibiting without tableaux has been discussed in great detail already by the show committee. We appreciate that it is perhaps unfair that certain aquarists should be excluded because their society can either not afford to put on a tableau, or does not have the enthusiasm.

We feel that there probably is a way for these keen individuals to be able to show but as yet we have not worked out the details—as soon as we have we will let everyone know.

*Aquarist:* What about the prize money? For a prestigious show such as this should it not be higher? And is it not possible to give all card winners a prize of some sort? Most societies manage to do this at their open shows so why does the F.N.A.S. find it so hard at B.A.F.?

*David:* I agree. There should be higher prize money—and prizes for card winners. The answer to this lies in more open sponsorship. Additional funds might be provided by inviting both individuals and firms within the aquatic trade to sponsor classes or sections of the Show. The latter would benefit from any publicity commensurate with such sponsorship.

*Aquarist:* Some specialist societies have not felt able to put on stands in recent years because they had to be competitive with the ordinary society tableaux. Do you envisage any change in this policy?

*David:* I most certainly do. The specialist societies represent the 'inner rooms' of the hobby. One walks through the door of community fishkeeping and then perhaps into specialisation. The hobby as a whole owes a lot to the specialist clubs because they often fulfil a genuine need for information. I intend to invite all Britain's specialist societies and I hope they will decide to be present at B.A.F. 1981.

*Aquarist:* What sort of a role do you think the traders have to play in the new set-up?

*David:* First of all I must thank the traders for faithfully supporting the show for many years.

I would like to foster a better relationship with them because they play a very important part at the show, both in the financial contribution they make and the displays they put on for the public.

Although some traders may be concerned about the possible change of venue after 29 years, I feel that if there is a better understanding and co-operation between us all, a new venue, along with all the other changes, could auger well for the future of the event.

*Aquarist:* Are there any other ideas you are considering?

*David:* Yes, there are several new ideas and perhaps the one that excites me most is a photograph competition. This could well turn out to be an international event and we are already looking into the possibility of getting a top natural history photographer to be one of the judges.

*Aquarist:* What about the furnished aquaria section? Any new thoughts on that?

*David:* This is one of the things the visiting public really like to see at the show and we do have a couple of ideas on how it could be made more attractive. However, we depend very much on the clubs helping to make it successful and before releasing too much we would like to discuss it with them first.

Good furnished aquaria can not only draw the public into the hobby it can also provide good public relations for the clubs themselves. It can be one of the highlights of the show.

*Aquarist:* Anything else?

*David:* There is also a suggestion that we have an arts and crafts section for people who like to paint or sculpt aquatic subjects, and we are also looking into the possibility of a major personality to perhaps open the show and/or present the prizes.

We are however, open to any and all suggestions from aquarists everywhere as this is, after all, their show.

Can I add in conclusion that I still feel that the British Aquarists' Festival is the best in the country on its day—and is recognised as such.

I see my job as keeping it on top and not resting on the past record of my predecessors.

*Footnote:*

As principal sponsor for the British Aquarists Festival, this magazine would like to welcome Mr David Sands, the new Show Organizer elect. Any changes which he may introduce to the benefit of the event in future years will of course, have our full support.

During the months leading up to the Festival, 'The Aquarist' will be pleased to receive constructive comments from any aquarium society, members of the aquatic trade or individual hobbyist. Send your ideas and views direct to us. All correspondence will be forwarded to the organizer, and the most interesting and original contributions will be published in future issues.





# Coldwater Jottings

by Frank W. Orme

FOR MANY coldwater fishkeepers March signals the start of a new fish-breeding season. Although it can be a very cold month—hard frosts and snow are not uncommon—the temperatures are slowly warming up, and the hours of daylight lengthening. Both factors tend to influence the fishes, and cause them to show increasing activity. This is more noticeable in the fish-house where the more protected environment promotes an earlier response from the fish—and, in general, it is in the fish-house that controlled breeding takes place.

At the risk of boring the more experienced aquarist, I feel that the newcomer to fish breeding may welcome a little advice. Obviously, it is essential that a true pair are used. Too often the novice has been disappointed in failing to either obtain any eggs or, when eggs are produced, the failure of the spawn to hatch. It must be realised that, when in breeding condition, males will chase males and females will chase females—the latter shedding their eggs if they are ripe, but, of course, they will be unfertilized. Normally, during the breeding season, goldfish and koi males will develop small white pimples, known as tubercles, upon the front rays of the pectoral fins, the gill covers and other areas of the head. The females will become plumper as the eggs develop, often causing the fish to appear more swollen on one side than the other—although this may not be quite so evident in the shorter, fat-bodied varieties of fancy goldfish. Due to the large size of koi, these fish are usually spawned in ponds, however, the fancy goldfish are normally bred in tanks where more control can be exercised over the selection of the breeding pair.

#### Best Conditions

It is essential that the selected fish should be given the best of conditions and allowed plenty of good, nourishing foods to bring them into that peak of condition which will encourage the fish to spawn. Live foods should predominate in the diet. It is generally considered that the

finest of all live foods for conditioning the fishes is the common garden worm. Best of all are small red earthworms of around 2 inches long; these are tender, easy to cut into suitable portions for the size of the fish, and are eaten with apparent relish.

Whilst the breeding pair are being conditioned the opportunity can be taken to prepare the largest tank available for the spawning, and subsequent hatching of the spawn. Make sure that it is really clean and, preferably, sterilized. Place the disinfected tank in such a position that it catches the rays of the early morning sun—the morning sun seems to encourage the instinct to spawn. Fill it with clean, fresh water and leave until the fish are ready to be placed in it. The spawning medium can be well cleaned and disinfected fine-leaved plants or, as I prefer, mops made from lengths of synthetic knitting wool, approximately 12 inches long and bound into bundles. They should be boiled, prior to use, to remove any water-soluble dye. It is also advisable to give the pair of fishes a precautionary disinfectant bath to rid them of any possible flukes which they may be carrying. There is little point in ensuring that the tank is perfectly clean and then placing 'unclean' fish in it, which could place the young fish at risk.

#### Time and patience

Only time and patience are now required, the fish are clean and the tank and spawning medium are ready. Continue to feed with earthworms and other nourishing foods, siphoning away any accumulation of sediment or uneaten food. Take a look at the fish each evening and, when it is seen that they are showing an interest in each other, and exhibiting their breeding characteristics, the male can be caught and gently placed into the prepared tank. Add the plants or wool mops at one end of the tank, and leave the fish to settle down in its strange surroundings. The following evening the female can join

*Continued on page 53*

# Beginning with Tropicals (9)

by Roy Pinks

PERHAPS THE MOST difficult decisions for fishkeepers concern the selection of species: even the most seasoned of us find it difficult to choose or reject, and the most we achieve in a lifetime of experience is the lesson that we should never buy on impulse.

Despite what I have written about some of the drawbacks of mixed collections, beginners are bound to want to have a dozen or so different species in their first tank, both to provide variety of form and colour, and to present a combination of different temperaments. Shortly before last Christmas I set up a 36 in. × 15 in. × 18 in. deep tank with the aim of trying out some of my own preferences seen through the eye of the beginner. We are all beginners in fact when we set up a new tank, whatever the experts may say, since nobody can really predict accurately just how it will turn out. In this particular case, for example, the plantings went rather badly wrong, but I was particularly pleased with the combination of species because, notwithstanding a bad and protracted outbreak of White Spot, it succeeded in its main aims. I made it a practice to buy at least 4 of each species, with two exceptions, in the hope that like would shoal with like and, as will be seen, the results were quite varied. I was forced to buy the fish over a period of about a month, which was a pity, as successive importations always increase the liability of incurring disease, and this in fact applied to this set of trials.

## Glittering Tetras

The first quartet consisted of *Hemigrammus armstrongi*, variously dubbed the Gold or Platinum Tetra. There is scarcely a more mirror-like tiny tetra in the whole vocabulary than this species, which rarely grows above 1½ in. The overall colour is either silver or gold, like the metallic paint, and it really does glitter. Some authorities state that the colouring, which can be patchy, is a form of disease, and that only the gold form occurs naturally. Disease or not, this has not the slightest effect on other fish, and as it seems not to vary in appearance on individual specimens during their lifetimes, I am inclined to regard this theory as being as substantial as those livebearing Harlequins!

My four fish settled in with no difficulty, and were devouring large quantities of chopped whiteworm within minutes of taking up residence. Whilst they dart quickly amongst the plants, playfully nudging or pecking at one another, they generally keep well to the front of the tank, and are always much in evidence. The black markings at the base of the tail match their very dark eyes, and all in all they look very distinguished and possibly expensive. They retail at about 50p, depending on size. Mine have grown steadily over 9 months, and the slimmer males are easily distinguished from the female fish. There seem to have been a few spawnings, but in a mixed tank these are merely academic, though the tendency could be followed up to advantage if some breeding experiments were to be set up.

As a shoaling species the Golden Tetra looked very promising from the start, and perhaps of all the fish I have since bought it has remained a reliable performer in this role. It may be wondered why I lay so much stress on shoaling—it is simply that fish which do not look rather like spare parts by comparison with those which get into the habit. The behaviourists will probably get at me on this point. I think it is true that most fish will shoal at times or under certain conditions, but some seem to do so more automatically than others. From my own observations I would guess that shoaling relates to heightened activity, such as looking for food, possibly seeking suitable spawning sites, and routinely keeping together when moving around for the sake of security. Increased nervousness seems to tend to shoaling, so perhaps the livelier and more nervy fish possess more of the tendency. We shall see.

## Neons and Cardinals

A main aim was a very large shoal of Neons and or Cardinals, and no one needs any description of these beauties. I think I assembled about 30 of these, quite small but solid fish, but unfortunately there was immediate tragedy, which I am still not sure I have accounted for. I took the fish home in 2 bags, with 10 Neons in one and 20 Cardinals in the other. The bags were floated for

*Continued on page 59*



## Product news and views

THE MICRO-STAT ELECTRONIC THERMOSTAT, manufactured by Tanstaafi Electronics Limited, Registered Office—Thakrar Coombs & Company, Weir Bank, Bray-on-Thames, Maidenhead SL6 2ED, and distributed by Ashford Aquatics, 129 Convent Road, Ashford, Middlesex, price £19.95, plus 70p postage and packing.

The Micro-Stat Electronic Thermostat is the first micro-chip-controlled external thermostat that I've seen. It consists of a small, metal box, of approximately 4 in. x 2 in. x 1 in., with a grey finish. Protruding from one side of the box are three, three-core cables of approximately 2 ft. 9 in. in length and also grey in colour. Two of the cables have their ends stripped bare, thus exposing the earth, live and neutral wires for connection; one cable is labelled 'heater' and the other 'mains'. The third, grey cable has a black, plastic sheath over approximately 1½ in. of its end. Although unlabelled, this is the temperature 'sensor'. (See photograph inside front cover of the January *Aquarist*.)

The upper surface of the metal box displays two small, red lights, one labelled 'heating' and the other 'safe'. A larger, red, plastic, dome-shaped cap can be snapped off to disclose a screwdriver-operated, plastic screw that is used to adjust the thermostat to the temperature required. On the underside of the box there are four screws, covered in red 'paint', that seal the unit. The thermostat is, naturally, guaranteed for one year; the guarantee is rendered void if these seals are broken. A small, red label, stuck onto the base, shows the unit's serial number. Printed on the base, in red lettering, is the information: "Tanstaafi Electronics Ltd., Company No. 1363195 England. Aquatic model. Resistive loads only—maximum rating 1150 watts (5 amp.) at 230 volts, 50 Hz. Guarantee void if opened. Not for sale or use in U.S.A." Also on the base are four white, 'rubber' feet. I decided not to break the seals and open

the test unit because I am not an electrician; and I did not want to invalidate the guarantee.

Publicity material states: "Micro-Stat is today's high reliability micro-chip technology answer to your tank temperature control problems. Micro-Stat, designed by an electronic engineer who is also a keen aquarist, originated after the successive failure of two conventional bi-metallic thermostats with the resulting loss of expensive, irreplaceable (sic) fish. A survey of available thermostats established a new design concept was required to achieve a satisfactory solution. Design features of Micro-Stat include: Micro-chip controller. Solid state switch which eliminates the contact sticking problem found in conventional bi-metallic thermostats. Time-proportional temperature control technique ensures high stability of tank temperature. Up to 8% energy saving compared with the conventional thermostat (from Department of Environment report). Advanced design technique incorporated ensures maximised suppression of interference—no more clicks in your radio, TV and stereo. Single model covers all power requirements up to 1150 watts sufficient for 125 gallon—575 litre tank in an unheated room. Suitable for tropical and marine tanks. If you value your fish can you afford not to use 'Micro Stat'? Price £19.95 plus 70p p. & p. Fully guaranteed."

Under the heading "Recommended heater power" the instructions supplied with the Micro-Stat state: "A minimum heater rated power of 100 watts per 7.5 gallons (28.3 litres), e.g. a 30 gallon tank will require heater(s) totalling 400 watts. Do not exceed the maximum of 1150 watts that this Micro-Stat model is rated for." The instructions also inform us: "If the Micro-Stat is for use in a marine or tropical aquarium which will contain fish that may bite the cable, then the cable and sensor must be enclosed in a suitable protective tube. This tube must be free-flooding, i.e. able to fill with the tank water through an aperture in the base of the tube. The sensor: The sensor is to be placed in the tank away from the heaters and away from turbulent water, i.e. not in the outlet of the filtration system."

For operation with the Micro-Stat one must purchase a suitable heater with a three-wire lead, i.e. a heater that is earthed. I purchased a suitable one—a well-known brand—at £3.45. I also required a suitable plug; I bought a 13 amp one in a local supermarket for 39p, and then spent a bit more on a 3 amp fuse to fit in the plug in place of the 13 amp fuse supplied. (I often wonder why such plugs are always supplied fitted with 13 amp fuses; I feel one should be allowed to choose the fuse one required when purchasing a plug; I certainly find that I require 3 amp and 5 amp fuses much more frequently than I need 13 amp fuses; and a packet of five fuses is not exactly cheap!) To use the Micro-Stat I also had to spend 80p on a cable connector.

Next I connected the heater I bought onto the Micro-Stat. The supplied instructions state: "The heater cable—The connections to this cable must be done before (connecting) the mains cable. The heater cable has three cores—brown, to heater live; blue, to heater neutral; green/yellow, to heater earth. The joining of the two

cables (Micro-Stat heater cable to the heater cable) should be achieved with an insulated terminal block (3 way). The completed joined leads must be kept well away from water." Then I connected the mains lead from the thermostat to the 13 amp plug and exchanged the 13 amp fuse for a 3 amp fuse. The instructions give details of the fuse rating required. (A 2 amp fuse was recommended for the heater wattage I was using but the store did not stock 2 amp fuses.) I had to use the Micro-Stat plugged in directly to the mains. Other conditions apply if "... all electrical items (are) supplied from a 'cable tidy' which is connected to a single mains plug and wall socket."

The instructions continue: "Ensure that the sensors and heater(s) are positioned in the tank and are fully immersed before switching the mains on. After the mains is switched on check that the 'safe when lit' indicator (light) is dimly lit. If it is not then a fault exists in the mains wiring; it may be one of the following:— (i) mains fuse blown; (ii) earth not correctly connected; (iii) live and neutral crossed over. It is important to correctly connect the mains wiring; if in doubt consult a competent qualified electrician." I managed to get the unit wired up correctly first time and installed both heater and sensor in a small aquarium.

These are the instructions given for "Setting up the tank temperature: Set the user control fully anti-clockwise, by using a screwdriver or small coin; the friction clamp must not be undone; this corresponds to the minimum temperature. Switch the mains on; place a thermometer in the tank in an easily observable position. The following discussions assume that the tank is freshly filled with cold water at a temperature below the Micro-Stat minimum. Check that the 'heating' indicator (light) is lit; this indicator is only lit when power is connected to the heater. Check that the tank water temperature increases (over a few hours, dependent upon the heater wattage and the tank water capacity). Gradual adjustment of the user control will be required to obtain the desired tank temperature. The heating indicator: This indicator is only lit when power is applied to the heater. The Micro-Stat uses a time-proportional principle to regulate the temperature (a diagram is supplied); this means that if the temperature difference between the tank and the user control setting is large then power will be applied for a longer time within a control period. If however the temperature difference between the tank and the user control is small then the power will be applied for a short time within a control period. The control period for the Micro-Stat is a nominal 80 seconds; this means that the 'heating' indicator may be on for a long or short time within each 80 second period dependent upon the temperature difference between sensor and user control."

In use, I found that it took me some time, over a period, to get the Micro-Stat adjusted to give the temperature I required. There is no temperature scale on the user control screw and one has to obtain the required temperature by trial and error. Obviously this process has to be done only once when using a given heater in a given aquarium, after which the little cap may be replaced over the adjustment screw. Once the unit was set up and correctly

adjusted it gave accurate temperature control—which is what one requires of any thermostat. It would be impossible to knock off the temperature setting accidentally because a screwdriver is required to adjust it.

In an earlier paragraph I mentioned having placed the Micro-Stat sensor, and the heater I bought, in a small aquarium. I had to use a small, portable aquarium for my tests because my two groups of tanks are situated some distance from a mains power point and the cables on the Micro-Stat are relatively short—and this is my main reservation about the unit. Minor reservations include the cost of the unit; and the fact that I found it difficult to work out how I could easily have wired in a second heater, had I required one (which I didn't).

The heater that I bought—and I had to select a brand with an earth wire included in the cable—also had a relatively short length of cable fitted; indeed it is approximately only 2 ft. 4 in. in length. With the power switched off, I plugged the plug I'd fitted onto the mains cable of the Micro-Stat into a wall socket. The combined length of the mains cable, via the thermostat, along the 'stat's heater cable, the three-way connector block, and along the cable supplied with the heater, was approximately 8 ft. The combined length from plug, via 'stat, along to the sensor tip was approximately 5 ft. 9 in.

When I plugged the mains cable into a power point in my skirting board the units would not reach to any of my usual, decorated tanks because they are situated several feet from a mains power point; and I do not have my cable tides fitted with earthing wires because I prefer double-insulated heaters and thermostats, or double-insulated combined units as these require only a thinner, two-core cable. The solution, in the case of the Micro-Stat, would be much longer three-core cables fitted to the unit; or a three-core extension lead, fitted with a 'trailing' 13 amp plug socket (which would increase the cost rather considerably); or a cable-tidy, complete with earth wire, situated on or beside the aquarium, into which the mains lead from the Micro-Stat could be wired. Of the three suggestions I've made, the three-core (earthed) cable tidy would be the simplest solution. (Interpet make an exceptionally neat little Aquarium Cable Tidy and Connector that has a provision for an earthed mains lead to be fitted. Incidentally, Interpet heating units—such as the Super Minimatic—are supplied fitted with two full metres of double-core cable (the units are double insulated and do not require an earth), which means over six-and-a-half feet of cable—a very sensible and safe length that ensures that any connections one makes are kept well away from the aquarium water.)

Another two points struck me: where should one site the actual Micro-Stat metal box in relation to one's aquarium; and how can one 'fix' hold the small sensor 'probe' in position in the aquarium water, because its three core cable is much too thin to be held in a conventional heater or thermostat holder? To obtain answers I decided to telephone Ashford Aquatics, who market the Micro-Stat.

A helpful gentleman at Ashford Aquatics chatted with me and provided answers. I asked about the length of the cables and he told me that it's difficult to provide a length

of cable that will suit everyone's individual needs; he also pointed out that such cable is expensive and costs have to be kept down. I asked about the fitting of a second heater and he told me that at Ashford Aquatics they use up to four heaters controlled by one Micro-Stat. Apparently one can fit an extension using an additional three-way connection block to solve the problem. I remarked on the small, neat size of the Micro-Stat; and he pointed out that the beauty of the unit includes the fact that the small unit may be situated beside or behind one's tank, out of the way. My query about how to fix the sensor probe in the aquarium brought a simple solution: several firms, including Algarde, market airline clips that will do the job. I also enquired of the gentleman at Ashford about the Micro-Stat's accuracy and reliability. He told me that they'd found the unit to be accurate to within a half degree; and that the electronics engineer who designed the Micro-Stat had had the unit on test for over a year without meeting any problems.

As a last test I decided to see and hear if the Micro-Stat, when switching off and on, interfered with radio or TV reception. I switched it off and on literally beside a radio and a TV. There was neither sight nor sound of it on

television; and not the slightest suggestion of a click either on AM or FM radio programmes.

I can certainly recommend this extremely neat little unit, the first unit that I've tested that seems successfully to have solved the problems associated with the use of the proverbial micro-chip in aquarium heating control technology. I don't think it would be unfair to say that the Micro-Stat is not cheap: one of these units, plus a heater, insulated connector and plug could cost approximately £24.00—for which sum one could probably buy about three good-quality, conventional, combined heater/stat units from another manufacturer.

I know that other manufacturers are also working on aquarium heating control units incorporating the micro-chip and I look forward to testing their units when they are marketed. Aquarists who'd like to use the new technology now could well invest in a Micro-Stat Electronic Thermostat.

I have put a lot of effort into the production of this report, which is quite long, but I felt that a quality product in this price range deserved a proper examination and a detailed report of my findings. I hope you find it useful in assessing the Micro-Stat's merits.

B. Whiteside.



O.F.I. to hold official meeting with I.A.T.A. early in 1981  
At the O.F.I. Directors' meeting in Geneva it was confirmed that a delegation of O.F.I. Directors have been invited to meet with the I.A.T.A. Livestock Committee with a view to discussing mutual co-operation and improved handling of livestock by air lines.

Mr. Chaudry of the United Nations International Trade Centre addressed the meeting, confirming a closer official link with the Trade Centre and O.F.I. He also produced a copy of a survey carried out by the U.N. in 1979 which goes into many detailed statistics of markets, suppliers, values, and observations, etc., the report is available on limited sale to O.F.I. members only, price 35 U.S. dollars.

Mr. Chaudry expressed a wish for O.F.I. to become involved by giving technical assistance in the new developing regions of Africa.

Mrs. Vera Paccagnella, the O.F.I. General Secretary produced some startling figures taken from a recent

O.F.I. survey relating to imports from the world traffic in ornamental fish.

The American organisation Pijac (Pet Industry Joint Advisory Council) declared a wish to exchange membership with O.F.I. The objective is to strengthen relationships and work jointly for the benefits of the aquatic industry.

The board received notice of resignation from Mr. Remke, the German Vice-President, due to ill health. The President, Mr. Werther Paccagnella expressed his regret and thanked Mr. Remke, a founder member, for his very substantial contribution to O.F.I. throughout its existence.

Mrs. Janet Cruise of England was elected to the board filling the vacant seat left by the very sad loss of Malcolm Hardy.

Much discussion took place on the subject of disputes within the industry. The directors took immediate action to solve matters within its own ranks. It was agreed that it is necessary to illustrate clearly to everyone that O.F.I. are prepared and determined to face this kind of problem, taking immediate steps to resolve disputes through the strength of the membership and establish a credibility much needed in the livestock sector of the aquatic industry.

The next board of directors' meeting will be held in Madrid during March 1981. Plans have been discussed for the 1981 General Assembly to be held in Singapore, June 1981 when a combined business trip and attendance of the assembly should prove attractive and beneficial to all members. A full detailed and statistical report has been circulated to all members.

KEITH BARRACLOUGH,  
Press Officer.



A NEW FLAKED diet for cichlids and other large aquarium fish has been launched by Tetra. Called Tetra Cichlid, it was developed specifically to cater for the nutritional needs of cichlids.

It is the result of several years' intensive research at the Tetra laboratories in West Germany and subsequent trials at West Aquarium, Europe's largest breeder of aquarium fish.

Regular use of the food improves growth rate and readiness to breed, as well as increasing resistance to disease. The product also contains natural pigment enhancers which will greatly improve the coloration of all aquarium fish.

Tetra Cichlid is a complete staple diet for all carnivorous cichlids and many other large aquarium fish. For more herbivorous species like some marine fish and certain Rift Valley cichlids, it should be fed in conjunction with Tetra Conditioning Food. Tetra Cichlid may also be used to add all-important variety to the diet of tropical freshwater fish in a community tank.

The high-protein content of carefully-balanced amino acids and correspondingly low fat levels give the fish an easily-digested, balanced and highly-nutritional diet. Fish should be fed on Tetra Cichlid two to four times a day with only as much as can be consumed in a few minutes.

Tetra Cichlid is available in 80 gram sealed drums with a recommended retail price of £3.49.

Press Inquiries: Christine Warwick, Eastleigh (0703) 619777. Technical Inquiries: Dr. Christopher Andrews, Tetra information Centre, 15 Newlay Lane Place, Leeds, LS13 2BB.

#### Coldwater Jottings—Continued from page 48

her partner. If, within a short time, the male begins to lazily chase and nudge the female it is possible that the following morning will find the pair spawning.

The act of spawning cannot be mistaken. The male will relentlessly chase the female around the tank, giving her no respite from his attentions, driving her into the spawning area where she will release her eggs at intervals. These are fertilised by the sperms which are contained in the milk, which the male sheds into the water. As the compressed egg is released by the female, it expands and draws in a small amount of the sperm bearing water. The egg will adhere to any surface with which it comes into contact as it falls through the water, and is about pin-head size. The spawning will continue for some hours, and the pair should be left until around mid-day. They should then be removed, to prevent them starting to eat the eggs, and well fed to allow them to recover from their exertions.

Should the fish not live up to expectations, allow them to remain in the tank for a few days but, if they fail to spawn, remove them and continue to condition them before trying again.

#### Eggs

The eggs are a translucent clear to amber colour, the infertile eggs turning white and becoming fungused, and can be left to hatch naturally or, as is more usual, the water temperature can be slowly raised to 70°F (21°C) to give a quicker hatching. Within reason, the shorter the hatching time the less chance there is for any pests to attack the eggs.

After a time the newly hatched alevins will be seen hanging on the glass of the tank and on the spawning material, they will look like very small splinters of glass. Take care not to disturb them at this stage, otherwise they will fall to the bottom of the tank and may have difficulty reaching the water surface—which they must do in order to fill their swim-bladder.

Within a few days these minute fish will be darting around the tank in their search for food. Offer them plenty of newly hatched Brine Shrimps until they have grown sufficiently to accept very small *Daphnia* and/or finely mashed whiteworms and powdered dry food. Always suit the size of the food to the size of the fishes, and feed plentifully, however, ensure that any uneaten dry food is removed to avoid it polluting the water. At this stage the young fish will feed almost continuously and should make fairly rapid growth. In order to encourage their satisfactory rate of growth they must be allowed plenty of swimming space, in uncrowded conditions. By closely inspecting the young every day, and removing any deformed or weakly specimens the numbers can be reduced. However, if it is possible to spread the fish into other tanks it will be to their advantage.

Finally, do not try to raise too many young fishes, and never cross-breed different varieties. It is much more creditable to raise, say, half-a-dozen well-grown fish than to produce a hoard of inferior, undersized worthless specimens that bring no satisfaction.



## GOLDWATER Queries

by Arthur Boarder

**I have a garden pond 8 ft. x 4 ft., and of varying depths up to 20 inches. I have nine small goldfish and I am thinking of adding two Koi, but have read that the water needs aeration for them. Do you advise adding these fish?**

Although Koi like very well oxygenated and clear water, aeration is not necessary in a pond. However, your pond is hardly large enough for Koi as these fish can grow to a large size, in some cases up to two feet long. In a pond the size of yours I suggest that instead of Koi you get a few Shubunkins. These can be very colourful and will thrive well in a pond the size of yours.

**I have three very good show specimens of fantail goldfish which are three years old. Will they still keep in show condition as long as I care for them properly?**

I doubt very much if you will find that the fish will still win prizes in good company after three or four years. It has been my experience that very good fantails will gradually lose their show value as they grow. This is because the fins tend to grow out of proportion to the rest of the fish. This is especially noticeable with the caudal fin. Instead of the fin being held out at a level with the body, it will tend to become extended and trail in a flowing position, and after a year or two will become fully trailing. I have seen the same thing happen to Bristol shubunkins which have grown finnage which is too long and flowing for the variety. Is there anything you can do to avoid this from happening? It will help considerably to keep the fish in as cool conditions as possible. The warmer the water the more the fish will tend to grow and the fins will do so at a faster rate than the rest of the fish.

**We have a lake in our garden which is just over half an acre in size. It contains a number of fishes and we would like to develop it into a profitable business and so would like any advice you can offer?**

It will not be easy to use the lake as a basis for breeding fishes in order to make a profit. You did not give the names of the species of fishes already in the lake. If there are several species it would be almost impossible to breed one particular type or species which would command a good price on the market. I can only suggest that the lake would have to be completely cleared of all fishes, a task which would not be easy. Then you could make up

### READERS SERVICE

Our experts are always pleased to receive your letters which should be addressed to:  
**Readers Service, The Aquarist & Pond-keeper, The Butts, Brentford, Middlesex, TW8 8BN.**

All queries requiring a personal response must be accompanied by a stamped addressed envelope.

your mind on which one particular kind of fish you wish to breed. My choice would be golden orfe. These fish like plenty of space in which to breed and you could get a better price for the young ones than you could get for common goldfish. I do not think that it would be of any use trying to breed any of the varieties of fancy goldfish as so few of the youngsters would be worth a good price and the fact that the young ones need constant sorting would make the task almost impossible. The only other fish you might like to try would be Trout. You could buy fry and grow them on when they would need plenty of food in the form of pellets. My advice is to keep the lake as a nice hobby and forget about making any cash from the venture.

**I am thinking of constructing a pond, 7 ft. x 4 ft., for Minnows. At what depth should I make the pond as I believe these fish like shallow water? Also where can I get the Minnows?**

I do not think that you will be able to have a depth of more than about eighteen inches anywhere in your pond. There would, of course, be some shallow at the sides. You may not be able to get Minnows from the usual pet shop and I suggest that you find a suitable stream and catch some yourself. A minnow trap baited with bread will soon attract them in any stream where they abound.

**Can you tell me how to plant Lagarosiphon in the pond and get a good growth?**

*Lagarosiphon major*, is a fine plant for the pond and needs very little attention once it gets established. However, it certainly appears to thrive better in the southern counties than in the north. If you have a small plastic container with a very little decayed turf in it, a few stems of the plant set in it will soon send out roots to use up much of the waste matter in the pond. Once established, the plant can grow shoots a couple of feet long in a short space of time.

**I have been breeding fantail goldfish for many years but had to give up a year or two ago. Wishing to start again I bought seven red scaled fantails and as the pond was not quite ready I put them in a tank. I changed the water almost every day and the fish spawned every month. Among the fry is a fish which is quite pink. I have never known this before and your comments will be welcomed.**

Incidentally, in 1954 I won best fish in show at Hendon, with one of your strain fantails.

The pink fish will be what is termed a sport. Such fishes turn up occasionally and they may be from such fishes that the various fancy goldfish have been evolved. I see from my records that you had some fantail fry from me in May, 1952.

Can you recognise the fish depicted on the enclosed sketch? I was told that it is a Japanese weather fish, but it does not closely resemble the illustrations I have seen of this fish.

The fish described and sketched appears to be a Japanese Weather fish, *Misgurnus anguillicaudatus*. It is rather like the ordinary weather fish, *Misgurnus fossilis fossilis*.

I have a pond, 12 ft. x 8 ft. x 2 ft. with a Butyl liner. It is stocked with fishes and plenty of water plants. The fishes seem all right but the leaves of the water plants, above water level are riddled with worm-like holes. Can you explain this please and give a cure?

From the description of the leaves I think that the trouble is caused by the larva of the Brown China Marks Moth. The larvae are like tiny transparent worms and can disfigure the above-water leaves of plants. You cannot spray with an insecticide as you would harm the fishes. One way to shift them is to wash them off with a strong hose. Also, if possible, push the leaves under the water when the pests will be washed off. The fishes will probably eat them. If the affected leaves are kept under water for a short time the pests will drown.

I have been keeping tropical fishes for some time and now would like to breed pearl-scaled goldfish. Can you tell me what to look for in specimens and where I can get some?

The type of scaled goldfish is usually the fantail and so the fish should resemble the ordinary fantail in its general shape. The distinguishing feature is that the scales are cup-shaped and so give the body of the fish a knobby appearance. You should be able to get some from the address I have enclosed.

I have a good sized pond with a number of different kinds of fishes in it. I cannot keep the water clear as it soon becomes green. I run rain water in from the roof and have no water lilies as I think they hide the fishes from view. If I wash the pond through with a hose it brings up a lot of deposit from the base. What am I doing wrong?

As there are no water lily leaves to help to shade out the sunlight, it is certain that the water will become green. As for the deposit in the bottom, as you have a number of fish in the pond their droppings will soon build up a fair amount of silt or mulm. Then you are introducing more filth from the roof with the rain water. Stop the water from the roof entering the pond and get some water lilies. Too much light is entering the water which causes it to turn green.

I have a garden pond 10 ft. x 8 ft. x 2 ft. with 24 fishes of various types including Orfe and Koi. Would it be wise to buy any more fish or do you think the pond is fully stocked?

I suggest that you do not add to the stock you have already in the pond. As you are new to the hobby it is essential that you gain some practical experience in fish keeping before buying any more fish. It is not the number of fish in a pond that matters but it all depends on their sizes. The Orfe and Koi can grow fairly quickly and both species need plenty of swimming space. It is very important to try to get some information on the subject before starting but I doubt very much if more than one person in a thousand thinks of reading up about fishes before buying their first fish. All the information written in magazines gives the information to people who have had failures whereas it is usually too late and many prospective aquarists are discouraged at the outset.

In your book, "Coldwater Fishkeeping," I have seen the picture of a Hi-goï and being interested I have looked over many pet shops but have been unable to find one for sale anywhere. Your comments would be appreciated?

The Hi-goï is not a fish usually stocked by the average pet shop. This fish grows too large for an indoor tank and is only suitable for a large pond. However, I will enclose an address from where you should be able to get the fish you require.

What is the best depth for a garden pond?

The depth will depend to a great extent on the size of the pond. Obviously a small pond would not be able to have a good depth. Deep water enables the fishes to remain well down out of trouble when the pond freezes over. The more shallow a pond the harder it is to keep it clear of green, floating Algae. This is because the light can get to a larger amount and it is always noticed that a shallow pond becomes green very quickly whereas deep water is not as likely to become very green. On the other hand, a shallow pond is almost certain to contain more oxygen than a deep one as more of it is exposed to the air allowing more oxygen to enter.

I am soon moving and have to transport six fancy goldfish, each four inches long, a three hour journey by road. What is the safest way to do this please?

The fish will travel well in plastic bags in strong cardboard containers. You should be able to get these from a pet shop. If the bags have been used before for fishes, wash them out well. If possible travel on a cool day or at least in the coolest time. Do not feed the fish for two days at least before packing. Use two or three bags, preferably three, and only half fill them with fresh cold water. Do not use water from a tank or pond. Do not secure the bags until the last minute and then see that plenty of air is trapped in the top half of the bag. Put containers in the coolest part of the vehicle and after two hours travelling open the bags for a few minutes to let in some fresh air.





## TROPICAL Queries

by Dr. C. Andrews

**I wish to set-up two 48 x 18 x 12 inch tanks for breeding angelfish and Ramirez's dwarf cichlids, one species in each tank. Can you provide me with some information on stocking levels, planting and filtration?**

You can keep about six pairs of adult angelfish in one aquarium, and around six or eight pairs of dwarf cichlids in the other. Large Amazon swords, *Vallisneria* and smallish *Cryptocorynes* will do for the angelfish tank. The dwarf cichlid tank must be well planted, with *Cryptocorynes*, *Vallisneria*, Java fern, etc. The dwarf cichlids will require flat stones on the tank floor as spawning sites; the angelfish should spawn on the Amazon sword leaves or you could provide sloping pieces of slate. For really good plant growth I suggest that you avoid undergravel filtration, and consider either two internal/external box filters, two polyfoam cartridge filters, or perhaps a reasonably priced power filter to service each tank. You may like to glance at the two new T.F.H. books on "Freshwater Angelfishes" (by Axelrod and Burgess) and "Dwarf Cichlids" (by Vierke), each priced at about £1.00.

**Can you provide me with any information on the breeding of axolotls?**

The breeding of these interesting and rather unusual amphibians is stimulated by decreasing daylength and temperature, and axolotls kept under constant conditions rarely breed. When kept in unheated aquaria in the U.K. they often breed during our winter. During courtship and mating the male axolotl deposits "packets of sperms" (or spermatophores) on rocks, etc. These the female picks up and places into her cloaca. About 24 hours later she lays fertilised eggs, which hatch after 2-3 weeks at 13-14°C. The spawning tank should contain plenty of weed (eg. *Elodea*, *Ceratophyllum*). The male axolotl should be removed after mating, and the female after she has laid her eggs. She may lay several hundred eggs over about 7 days. With both parents removed, the water level in the breeding tank should be reduced to about 10cm. When the young axolotls hatch they may be reared on infusoria and brineshrimp, later graduating onto *Daphnia*, white-worm, *Tubifex* and perhaps finely powdered fish food. Avoid overcrowding and tank pollution; carry out weekly partial water changes. You may find the book "All About Salamanders" by M. Roberts (T.F.H. Publications) of some interest.

**Can discus be kept with *kribensis*, and will *Aphyosemion australe* mix with cardinal tetras?**

Strictly speaking discus are fish for a one species tank, although you can usually (for example) keep several *Corydoras* catfish in a discus tank.

Apart from their rather special requirements for water quality, discus are also shy, delicate feeders. However, I do know that aquarists have successfully kept discus in large aquaria with small shoals of various small-medium sized tetras. In short, I would advise against keeping discus with *kribensis*.

*Aphyosemion australe* (or the byretail panchax) should mix with cardinal tetras. Both require soft, slightly acidic water conditions, with a temperature in the middle to upper 20s °C. However, if you hope to breed *A. australe*, it should be kept in a one species tank. A useful booklet on killifish keeping is available from B. C. Brown, British Killifish Association, 173 Parr Lane, Unsworth, Bury, Lancs. BL9 8JN. I have enclosed a reading list which you may find useful.

**I am shortly going away on holiday for two weeks. Can you give me any advice as to the care of my tropical fish while I am away?**

Many aquarists seem to dread going away on holiday—almost convinced that something terrible will happen in their absence. Fortunately, it rarely does! An article of mine dealing with the holiday care of fish appeared in the August 1979 issue of this magazine. In summary, it stated that if the tank is properly maintained for (say) 50 weeks of the year, it should be perfectly all right for the remaining two. There is no need to feed your fish extra during the few days before you depart, and rather than leave a neighbour in charge of their feeding while you are away, I suggest you impose a temporary fast. If they are properly fed for the rest of the year, they should easily survive a two (or even three) week period on stored food reserves, plant fragments, etc. I usually leave the filters running in my tanks when I'm away, and very often leave the lights permanently off. It is perhaps a good idea to get a reliable neighbour to pop in every couple of days to check for power failures, leaks, etc. As I said above, the main thing is to properly care for your tank when you are at home—and then you can relax and enjoy your holiday!

**I am a biology teacher who is considering setting up a small freshwater community tank in the laboratory, and using it as a teaching aid. Can you recommend any literature which may be useful?**

Fish seem to be becoming quite popular as teaching aids in schools. I have sent you some literature which you may find useful. Other relevant books include "Aquariums" by Evans (Foyles Handbook), "Tropical Fish" by Axelrod (T.F.H. Publications), "Tropical Fish" by Ward (MacDonald Educational) and "Making Your Own Aquarium" by Hansen (Bell and Hyman). There is also a book published by T.F.H. Publications entitled "The Educational Aquarium" (by Axelrod and Bader). Please let me know how your aquarium gets on.



## MARINE Queries

by Graham Cox

I have kept marine fish for the last two years with relatively good success. My fish have included Sweetlips, Regal Tang, Royal Gramma, Sailfin Tang and several anemones and shrimps. The tank is 48 in. x 12 in. x 15 in. and is generously decorated with living rock and coral. However, just recently, I had a very bad case of lymphocystis which killed every fish in the tank and consequently I decided to start all over again from "scratch" and I am now just beginning to mature the tank, but once fully mature, I would like to try my hand at something a little different in the way of marines, namely a six-lined Grouper (*Grammistes sexlineatus*), and therefore would like some queries answered:

- (1) Is this fish easy to purchase and if so, what approximate price and whereabouts would I get one?
- (2) Is my present tank large enough for it and if not, what size would you recommend?
- (3) How should I decorate it for this particular fish?
- (4) Is it possible to keep sea anemones with it?
- (5) What other fish could I keep with it, bearing in mind the size of the tank?
- (6) Feeding and lighting requirements?
- (7) How large would this fish grow in my tank, as I didn't really want to get a small juvenile and have to get rid of it as it grew larger?

Also could you please give me advice on another fish, namely the Maroon Clownfish, (*Premnas biaculeatus*). The above questions could be answered for this fish as well as for the Grouper.

(1) *Ease of purchase.* Both *Grammistes* and the Maroon Clownfish are easy to purchase at any time of year being non-seasonal fishes which are shipped in great numbers from the Philippines. Additionally, the Sixline Grouper is often imported from Sri Lanka and occasionally from Mauritius and Kenya. Consequently you should have no difficulty in obtaining either of these species. A juvenile *Grammistes* of say 2 in. overall length would cost about £5 in Summer or up to £6.50 in deep mid-Winter (1980 prices). The colour is fully developed by the time this grouper is 1 in. to 1½ in. long.

A good-sized Maroon Clownfish (*Premnas biaculeatus*) of say 1½-2 in. would cost about the same amount of money as the grouper.

Any aquatic specialist who stocks coralfish should be able to obtain well-quarantined specimens of both these fishes for you from a Wholesaler.

(2) *Size.* The largest *Premnas* I have ever seen was about 5½ in. long and I think that this female was probably maximum adult size for the species. In your tank a 2 in. *Premnas* would probably reach 3½ in. maximum and take 2-3 years to do so.

"I have seen 10 in. long Sixline Groupers on both Filipino and East African reefs."

The Sixline Grouper grows to about 10 in. in maximum length and I have seen this species at this size on both East African and Filipino reefs. In your aquarium an initially 2 in. long grouper would stop growing at 6-7 in. and would take about 18 months to 2 years to achieve this maximum size in a 48 in. tank. Your great problem would occur when, if sometime during the ensuing six to eight years (—groupers commonly live for 8-10 years) you decided to get rid of such a large fish. I wouldn't recommend you to offer it back to your local dealer since such a large specimen would be a slow seller and would take up a lot of tank space. You could eat it—but I wouldn't recommend that either. I tried eating a Sixline Grouper when I ran out of money in Mozambique in 1960. The flesh is edible (i.e. non-poisonous) but is very bitter-tasting, unlike many of the grouper family which have very sweet-tasting flesh. Your best means of disposal would probably be a public aquarium.

"In the Maroon Clown you have chosen the best of the clownfishes as a grouper playmate."

With regard to compatibility you have chosen the best (i.e. largest and most aggressive) of the clownfishes as a grouper "playmate" and I am confident that there would be no great problems provided that the two fishes are approximately equal in size when bought.

Your tank is large enough since its gross gallonage is roughly 31 gallons (140 litres) gross, and probably of the order of 25 gallons nett seawater capacity allowing for your generosity with the living rock. Thus if the tank is filtered with U/G filter only, you, as someone who is manifestly no longer a novice, could extend your stocking to the limit of 1 in. of fish length to each 3 gallons of seawater (= 8 in. of fish maximum) OR if you have U/G filtration and an auxiliary powerfilter, you could stock to the ultimate limit of 1 in. of fish to each 2 gallons you could stock to the ultimate limit of 1 in. fish to each 2 gallons of seawater, i.e. an absolute maximum of 12 in. of fish.

(3) *Tank Decor.*

(a) *for the grouper*—plenty of caves and over-hanging ledges.

(b) *for the clownfish*—as above but including an anemone—see (4) below.

(4) *Anemones.* Yes, an anemone of one of the long-

tentacled species would not only look attractive but would also make the *Premnas* feel more at home.

However, don't feel too disappointed if he does not use the anemone immediately. I have known *Premnas* ignore a suitable anemone for many months at a time.

(5) *Additional Fishes*. If you have read all the above very carefully, you will realise that, allowing for the maximum sizes reached, you won't have a great deal of room left for other fishes. If I were you I would build up an attractive collection of invertebrates instead—but bear in mind their special lighting requirements as mentioned in (b) below.

(6) (a) *Feeding*. No problems. Any form of flake-food and gamma-ray irradiated seafoods is taken greedily.

(b) *Lighting*. At a water-depth of 15 in. you will need at least 2 feet of fluorescent tube per each square foot of water surface. Your tank's S.A. is 3 sq. ft., so you need at least 8 ft. of lighting. My own choice would be as follows:

1 × 36 in. (30 watt) "GRO-LUX"

2 × 36 in. (30 watt) White tubes of any type (—the cheaper the better!)

(7) *Ultimate Size*—see (2) above.

I am writing to you because in the past Mr. Cox has been kind enough to answer one of my queries and I am hoping that some one can once again help me with what is, I am afraid, a serious problem.

About a week ago I discovered to my horror that one of my fish, a mullet which I have in a cold-water sea aquarium, had broken the thermometer and, of course, the contents had been released into the water. There were some tiny lead weights and a quantity of mercury. The lead weights were too small to find and would have been scattered all over the aquarium by the mullet which constantly takes in gravel and spits it out. I made some attempts to retrieve the mercury, but it lived up to its other name and could not be picked up, soon disappearing for ever beneath the gravel.

Can you advise me just how dangerous these metals are in my tank? I don't think there was very much of either, the thermometer appearing to contain a blue fluid, but there must have been mercury in the base. I have been watching the inmates closely since the accident—the mullet, which I have had since they were less than 1 in long, show no sign of illness whatsoever, nor does anything else, except two of the British hermit crabs and, possibly a tropical (blue) species which seems to have become too active, wandering about the aquarium far more than it used to.

Tonight I have changed about  $\frac{1}{2}$  of the water (there are about 25 gallons I think altogether) in an attempt to dilute any toxicity, but realise this may be of little effect. However, you will no doubt appreciate my reluctance to "take down" the whole tank and dispose of all the gravel.

Can you advise me whether there is any possibility of "getting away with it" by simply making frequent water changes until the mercury and lead have "disappeared" or become chemically inactive?

In the first place I must inform you that I have never seen an aquarium thermometer which contained both mercury and alcohol i.e. the blue liquid you refer to.

The blue-coloured alcohol would do no harm at all since the amount involved is too small and would soon be

**"If you want to be quite certain of saving your creatures' lives, you should reject the entire filter-bed and start again."**

biodegraded by the filterbed. The lead shot—and especially the mercury if present—are a different sort of problem altogether. Both mercury and lead ions are extremely toxic to virtually all forms of life if present in excess. In the case of marine-life present to excess actually means as little as the following:

*Lead*—more than 0.000032 parts per million

*Mercury*—more than 0.000030 parts per million

Consequent to the above, it will be obvious to you that you should reject your entire filter-bed and start again if you want to be quite certain of not poisoning your creatures.

In June of this year I purchased from your place SeAquariums in London, fish and inverts for my own marine set-up. The fish were one *Coris formosa*, one *Centropyge bispinosus* and one *Paracanthurus hepatus*. Inverts were two tube worms, one sea star, one anemone and one shrimp. All creatures were in the best of health, and all were feeding well. After a few weeks the wrasse ate the shrimp. This did not bother me too much as I expected some loss. But what really upset me was when the thermostat stuck while I was at work, and my wife also out of the house. All but the Tang died. So what makes me so mad is that people like yourself and others spend a lifetime finding out which is the best and safest way to keep marine creatures alive in an aquarium. And then you get these people who are supposed to be kings at making the equipment and they cannot even be bothered to try the stuff out before it goes to the shops. I do not mean all the equipment is the same but it almost made me pack in marines altogether.

Despite what has happened, what I would like to know is could you give me as much information to build the type of aquarium which they have at most zoos and public aquariums. The type I mean is made of concrete with just a glass front. I would like to make one approximately 6 ft. deep, 18 ft. long and 4 ft. wide.

To build a tank measuring 10 ft. × 4 ft. × 6 ft. vertical depth would need steel reinforced concrete walls 9 in.

thick using a *waterproofed* ready mixed concrete of 21 Newton strength. Even if you only put glass in the upper half of the 10 ft. x 6 ft. wall you would still need 1 in. thick glass plate to be really safe, i.e. a glass measuring say 8 ft. x 3 ft. x 1 in. thick so as to allow a 12 in. thick vertical *escutcheon inset* to support the glass. You would then allow 14 days for the concrete to cure and do an internal GRP layup using CRYSTIC 189 resin (*Scott-Bader Ltd* at Wollaston, Wellingboro, Herts supply this marine-grade non-toxic resin), and heat the tank by use of an electrical heating cable submerged in the concrete base of the tank. Incidentally, this concrete base should be 12 in. thick to support the considerable weight of water and rockwork used in such a large tank.

Finally, I must advise you that, should you decide to have the whole of the front face of the tank in glass, i.e. one panel measuring say 8 ft. by 4 ft. you would then need 2 in. thick glass to be really safe. I feel sure that once you have priced such thick glass you will settle for a piece 8 ft. x 3 ft. x 1 in. thick.

#### Beginning with Tropicals—

*Continued from page 49*

about an hour, the tops having been opened and well extended in order to admit air. Although the fish looked fit but not very adventurous after release, none gave any cause for anxiety, but when, after two days only five of the Cardinals were operating, I asked my dealer whether he had experienced any trouble. One look at his tank gave the answer that his fish were perfect, so I had to conclude either that the water change was responsible, or that too many had been conveyed in the one bag, and an oxygen shortage had irreparably damaged them.

But it remains a matter for conjecture. The replacements I acquired shortly after have, with the survivors, grown into excellent specimens, so I cannot fault the batch in any way. Quality has certainly been achieved, and I have a nice lot of fish, but these two species have failed almost completely to impress as a spectacle. In small sizes they make magnificent and unforgettable shoals, but as mine grew up they had a tendency to hang back into the fastnesses of the foliage, heads slightly down, ruminating almost, so that the eye has had to go to them, rather than vice versa.

To get the best from them I have to switch down from cold fluorescent plus one tungsten and one Gro Lux tube to just the latter two, whereupon they form up into a graceful group, like fireflies, and advance sedately down the tank. Unlike the Golden Tetras they keep to the rear and are less showy than one would wish, but they are, for all that, quite indispensable and quite the most lovely fish perhaps we shall be privileged enough to keep.

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*Acanthopagrus berda*

# Black Bream and Silver Bream

by  
William Ross

BRACKISH WATER aquaria appear to be growing in popularity. I feel Black Bream (*Acanthopagrus berda*—Forsk. 1775) and Silver Bream (*Rhabdosargus sarba*—Forsk. 1775) are two fish which may be of interest to tropical marine aquarists with a brackish water aquarium. Both these fish are very hardy and would make good starter fish for the marine hobbyist. In the wild both fish grow rather large, *Acanthopagrus berda* around 30 in, *Rhabdosargus sarba* to around 22 in. I doubt if many aquarists would be in a position to accommodate adult specimens but young fish of 3 in-4 in make ideal aquarium inhabitants.

I collected my specimens of the Sparidae family from a tidal influenced stream at Qatif Oasis in Saudi Arabia's Eastern Province. At low tide this fast flowing stream consists of mostly freshwater which has drained from the date and banana plantations. The water originates from deep aquifers 600 ft-800 ft under ground making its way to the surface by artesian wells, the water has a high mineral content therefore it is very hard.

*Acanthopagrus berda* has a high compressed body with a spinous dorsal fin, the first 11 rays are well formed hard rays the remaining 11/12 are soft. Anal fin consists of 3 hard rays and 8/9 soft rays, the second anal spine is large being helpful in the identification of this fish. Large pointed pectoral fins and a forked tail. Body colour is grey to silver in young fish, depending on mood there may be darkened vertical bars, in death the whole body darkens. Ventral and anal fins are a beautiful yellow making this a most attractive fish.

*Rhabdosargus sarba* has a high compressed body similar to *A. berda*. Dorsal fin 11 hard rays and 13/14 soft rays. Pectorals large and pointed, tail forked. Anal fin 3 hard rays and 11/12 soft rays. Body colour is silver, each scale has a gold centre giving the impression of yellowish lines. Face and opercula covered in small scales. Adult specimens develop a deep yellow abdomen, pelvic and anal fins. These fish have teeth with which they are capable of crushing snail's shells, it is interesting to watch them turning over stones looking for snails. If any fish could be recommended for eradicating snails, this is it;

their aquarium is completely snail free after a short time.

For keeping Black and Silver Bream I use my largest aquarium filled with tap water; my tap water originates from the same aquifers as the water at Qatif Oasis. Continuous filtration is a necessity as both fish are heavy messy eaters and have the bad habit of tearing plants to pieces. I plant strong Amazon sword plants at one end of the aquarium leaving a large open space at the front for these very active and fast swimming fish. Weekly partial water changes is appreciated by these fish.

Feeding them is no trouble, they accept proprietary prepared fish flakes and scraps from the table. *Rhabdosargus sarba* takes pond pellets and relishes snails transferred in from my other tanks. It doesn't take them long to realise when and where their food comes from and they collect at the surface waiting to be fed.

I have never attempted to keep both bream in the same aquarium but see no reason why specimens of similar size should not be kept together. It would be of great interest to hear if any of our keepers of local marines in Britain have had any success keeping some of our estuarine fish in similar water to that in which they are caught.

*Rhabdosargus sarba*



**Spotter's Guide to Aquarium Fishes** by David Ford. Published by Usborne Publishing, 20, Garrick Street, WC2E 9BJ. Hardback @ £1.99 and paperback @ 99p.

One of an extensive series on creatures and plants, this little book is designed to help the tyro aquarist identify popular aquarium fishes and is especially aimed at the young enthusiast.

Under family headings, popular tropical species and goldfish varieties are described and illustrated with excellent drawings in colour. Each fish is depicted under its common name but at the end of the book all species are listed using their scientific names with reference to the pages on which they appear. Thus the beginner can avoid over-complication with difficult Latin names but have them to hand when he needs them.

The descriptions are brief but adequate and each has an

adjacent circle in which a tick may be made when the species has been identified. At the back of the book there is a score-card on which can be entered the date the fish was seen and which gives points against each species, varying from five for the common species like guppies, to twenty-five for less common ones like the Spanish Killifish.

The second part of the book describes the setting up of an aquarium with drawings of the accessories, popular plants etc. There then follow notes on maintenance, algae problems, fish diseases, feeding, and care when on holiday. A bibliography for further reading and notes on the advantages of belonging to an aquarium society are also included.

A lot of sound information has been crammed into the sixty odd pages and the attractive result provides an ideal starter for any youngster on the threshold of embracing our hobby.

# Book Review

**Gardening with Children** by Alison Ross. Published at £5.25 by Faber and Faber, 3, Queen Square, WC1.

"The value of introducing children to the delights of gardening really needs to be experienced before it can be assessed. At its simplest level, gardening is recognised as a healthy, even health-giving, and productive occupation, but the benefits that may follow if the introduction has been a happy one can be very wide-reaching indeed."

So says the author in her introduction to this absorbing and information-packed book. Her aim has been, she goes on to say, not only to provide basic information for both adult and child would-be-gardeners, but to show how children can become involved in all aspects of gardening.

Adequately illustrated with attractive line drawings by Juliet Renny, chapters deal with: Sharing the Pleasure of Gardening, Wildlife in the Garden, Soil and Tools, Propagating Plants, The Garden Pond, Trees and Shrubs, Indoor Gardening. Particularly useful is the section on gardening for the young who are handicapped and house-bound, disabled or sightless. Those without access to

a garden or an outdoor space are not forgotten and the chapter on Indoor Gardening supplies a wealth of helpful advice about house-plants, growing in water, bottle gardens and the growing of edible seeds.

Under the heading of Further Topics for Discussion, Observation and Research, each chapter carries an appendix included to fan the flame of interest to the point of undertaking projects of research, experimentation and conservation.

At the end of the book are very comprehensive appendices on Garden Compost, Poisonous Plants, Book List, Useful Addresses, and Botanical Index.

Each chapter covers its subject comprehensively as, for example, that on the garden pond which describes the preparation of the site, pond construction, submerged and marginal plants, fish, wildlife in the pond from whirligig beetles to herons, and miniature water gardens.

This book is a delight to browse through and will give both great pleasure and much help to both young and not-so-young amateur gardeners.



# News from Aquarists' Societies

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

## SOUTH EAST



**Reading and District A.S.** inform us of the sudden death on 30th November of Peter Merritt. Peter was an old established member of the Reading A.S. He was most knowledgeable on aspects of fish keeping and will be greatly missed not only at the Reading Club, but amongst all his many friends within the fish keeping fraternity.

**THE Bedford & District Aquarist's Pondkeepers Society** held their 5th Annual Dinner and Dance at the Wilham Forest Hotel. This event finalized the events of the year by the awarding of the various trophies won in the many competitions held. To mention some of the competitors or events that this society run or enter are: Home Aquaria, Pond Competition, Fish House Competition, Annual Exhibition and Competition May Fair. During the year meetings are held on the second Monday in the month and to recap on one or two meetings in January we were entertained by John Hancock who had been selected as Field Officer on an expedition to the Chicago Islands, and it was on this they were fortunate to see a wonderful collection of slides coupled with a very interesting talk, enough to make even a non-fishkeeper envious. In March they were enlightened on the keeping and breeding of the African Cichlids and the December meeting was a film show, not silent movies, so everyone was able to enjoy the whole evening.

The society looks forward to yet another year of events, competitions and some good topics. Anybody interested in the club should contact L. Smith, 80 Mighell Avenue, Bedford, Essex or come to a meeting at Wyntress Library Hall, Sperrill Road, Wyntress E.11.

**Bethnal Green A.S. and Independent A.S.** have amalgamated to form a new Society called the **Bethnal Green and Independent A.S.** The elected officers include: Chairman, Mr. Andy Cox; secretary, Mr. P. Riley, 1 Harford Street, Tower Hamlets E.1; treasurer, Mr. David Foley; show secretary, Mr. Jim Brown. At their first meeting, the guest speaker was Mr. Terry Waller, of E.L.A.P.A., who gave a very entertaining quiz. Events planned for the rest of the year include table shows and inter-club shows, and guest speakers include Mr. Cyril Brown on "Skilles", Mr. Andy Cox on "Reptiles", and Mr. Derek Mills on "Coldwater fish".

Meetings are held at Windgor Terrace School, Windgor Terrace, London, E.8 and start at 7.30 p.m. New members assured of a very warm welcome.

FOLLOWING the recent a.g.m. of the **Catfish Association of Great Britain** the revised committee is as follows: President, D. Lambourne; chairman, K. Goodson; secretary, J. Carpenter, 10 Thornbank Close, Sturwell Moor, Saines, Middx; treasurer, Mrs. P. Lambourne; assistant secretary, Mrs. G. Sandford; P.R.O., S. Prichard; show secretary, T. Cruickshank; assistant editor, M. Standford; committee members, D. Allison; co-opted stock control, Mrs. D. Cruickshank.

**Aylesbury A.S.** on 3rd February had a lecture on Marine Aquaria arranged by their chairman. Mr. Sales arranged a demonstration on Aquarium construction on 17th February. All local aquarists welcome. Secretary, W. Davis, Green Garth, 181 Aston Clinton Road, Aylesbury, Bucks.

OFFICERS elected at the a.g.m. of the **South Essex Aquarist's Society** were: Chairman, G. Herring; secretary, Mrs. M. Dudley; treasurer, Mrs. H. Trim; show secretary, E. Franklin; assistant show secretary, Mrs. M. Franklin; lay member, T. Grove.

AT the monthly meeting of the **Mid-Sussex A.S.** at Ockley Lodge, Keymer on 8th January, the chairman Mr. B. Slade, welcomed Mr. Colin Powell and his wife Joan, speaker and judge respectively. The lecture for the evening was on Loaches and A.O.V. Egg-layers. The table show awards were: Guppies Pairs, L. B. Harde. Guppies Male; I. P. Levine. The 50 club draw for the month of January was won by N. Short, T. Tester and J. Oldacre. Meetings are held on the second Thursday of every month at Ockley Lodge, Ockley Lane, Keymer, from 8 p.m. Further information from the secretary, Mr. J. Birch, 14 Redwood Drive, Haywards Heath. (Tel: H. Heath 50585).

## SOUTH WEST



AT the a.g.m. of the **Bristol A.S.** the officers reports indicated that 1980 had been a very successful year. The retiring officers and committees were re-elected. The Secretary is Mr. V. Cole, 10 Hardwick Close, Bristol BS4 4NL. (Tel: 0272-711284).

The speaker Mr. V. Cole outlined the various factors that contributed to colour in goldfish. Starting with an ingenious apparatus to demonstrate the effects of incident light, he then dealt with the scale differences and the chromatophores. Using his own fish as examples, he was able to demonstrate the three scale groups and the various colours found in calico fish, including the often overlooked one of violet.

AT the January meeting of the **New Forest A.S.** held at Lymington Community Centre, the main item was a lecture and demonstration of "all glass" aquaria construction, given by Dave Kerr, of Salisbury A.S. His talk was the most helpful and entertaining item provided for members over the past few months. Ronald L. Trevera, club secretary, also informed the society that along with the show secretary, Peter Whorler, he had been able to set up an aquarium for the patients at Millfold Hospital, financed by the hospital's League of Friends. Guest judge for the table show was Mr. D. Ebdelstone, the winner in both the Guppy and Labryinth classes being Mr. T. Kirby. Prospective new members are always welcome at meetings, held on the third Monday of every month.

FOLLOWING the recent a.g.m. of **Trowbridge & District A.S.** current Club officials are: Chairman, Mr. W. Burton; treasurer, Mrs. J. Burton; secretary, Mr. P. C. Wheeler, 3 Sherborne Road, Trowbridge, Wilt.

## MIDLANDS AND WALES



AT the a.g.m. of **Bridgewater A.S.** the following officers were elected: Chairman, R. Price; secretary, K. Buckley; treasurer, D. Mason; show secretary, S. Almsough; committee members, G. Chadwick; E. Calow, G. Buncher, M. Massey and M. Young. The Club now meets at the "Ravens Arms Hotel", Peel Street, Farnworth, on alternate Tuesdays.

**THE Cannock & District A.S.** has had a wonderful fishkeeping year, and would like to thank all of the speakers, judges and enthusiasts who have helped make it so. The awards for 1980, will be presented at a special meeting on the 4th March. Award winners are: Champion of Champions, M. Kirkham; Home Aquaria (Senior), J. Le-Clainche; Home Aquaria (Junior), A. Potts; Miniature Aquaria, R. Potts; Fish Rearing, M. Kirkham; A.O.V. Catfish, Mrs. E. Davis; Plant Trophy, R. Potts; Pairs, M. Kirkham; Pairs over 4 inches, Mrs. E. Davis; Aggregate Senior; J. M. Kirkham; 2, J. Shaw; 3, F. Lyons. Aggregate Junior; J. A. Potts; 2, R. Hall; 3, S. Hall. Breeders Class, M. Kirkham; Darts (Single), R. Potts; Darts (Double), I. Souster and R. Potts. The society meets each first and third Tuesday every month at the Progressive Working Men's Club, Market Hall Street, Cannock, at 8.30 p.m. Several activities have already been organized for the coming year, and more information will gladly be given from Mr. R. Potts, Hon. Secretary, 25 Oaks Drive, Cannock, Staffordshire WS11 1EU. Visitors and new members are very welcome to attend.

**THE Association of Midlands Goldfish Keepers** met on 25th January at the Foleshill Community Centre, Coventry, to view a new class film presented by fellow member Mr. T. G. Sutton. This excellent film shows various aspects of breeding goldfish and how to successfully raise the young. It also shows Mr. Sutton in and around his fish-house, as he carries out the numerous tasks necessary to maintain and feed his large stock of quality fancy goldfish. Full details of the society can be obtained from the Honorary Secretary, Miss Gill Kedg, 6 Deangate, Houghton-on-the-Hill, Leicestershire.

AT the a.g.m. of the **Nuneaton A.S.** held at the Nuneaton Arts Centre, the following officers were elected: Chairman, Mr. K. Griffiths; vice-chairman, Mr. G. Cox; secretary, Mr. J. Liggins; treasurer, Mrs. J. Cox; show secretary, Mr. G. Hammonds. The Society now meets on the third Friday of each month at 7.45 p.m. at the Nuneaton Arts Centre, Pool Bank Street, Nuneaton.

**Wolverhampton A.S.** hold meetings on the first Saturday in every month (except August), at Oakley Community Centre, Marsh Lane, Wolverhampton, at 8 p.m. New visitors are always welcome and more information can be obtained from Anne Chell (tel: Wolverhampton 330714).

## EAST



AT the a.g.m. of the Gt. Yarmouth and District A.S. held at the Imperial Hotel on the 1st December the following officers were elected: chairman, R. Stearne; vice-chairman, R. Andrews; secretary, A. Kemp; treasurer, D. Lacey; show judge, G. Dreyfus; asst. secretary, A. Thorpe; committee, A. Knight, J. Durston, K. Smith, Mrs L. Durston; junior, Miss D. Thorpe. The G.Y.D.A.S. meets the 1st Monday in every month at the "Imperial Hotel", North Drive, Yarmouth. New members welcomed.

## NORTH



AT the a.g.m. of the Loughborough and District A.S., the following officers were elected: Chairman, Mr. W. Rodger; secretary, Mr. P. A. Hughes, 11 Packington Hill, Kegworth, Derby; treasurer, Mr. N. Hallam; show co-ordinator, Mr. G. Taylor; committee member, Mr. I. Paery. The Society meets every 2nd and 4th Thursday of the month in the "Charnwood Inn", The Rushes, Loughborough, at 8 p.m. Any new members welcome, all enquiries to the secretary.

THE following officers were elected at the Throckley A.S. a.g.m. on the 9th January: President, Mr. Tom Gray; chairman, Mr. J. English; secretary, Mrs. Rosemary Jones, 36 Whimfield Terrace, Highfield, Rowlands Gill, Tyne and Wear NE19 2JL; show secretary, Mrs. Doreen Lacey; treasurer, Mr. W. Lacey.

NEW Officers of Accrington A.S.: Secretary, Mr. Philip Hands, 15 Bridgefield Street, Hapton, Nr. Burnley, Lancs. BB12 7J5. (Tel: Fiddham 34881); treasurer, Mr. W. Webber; P.R.O., Mr. J. Holding. (Tel: Accrington 34204).

AT the a.g.m. of Macclesfield A.S. the following officers were elected: Chairman, Mr. B. Goddard; vice-chairman, Mr. J. Merriman; treasurer, Miss S. Goddard; secretary, Mr. R. K. Moran, 69 Nicholson Avenue, Harfield, Macclesfield; show show secretary, Mrs. P. Tomlinson, 14 Mize Avenue, Lytton Green, Sutton, Macclesfield; committee, Mrs. D. Goddard, Mr. W. Tomlinson, Mr. A. Whittaker, Mr. C. Swallow. Meetings are now held in the "White Hart", Roe Street, Macclesfield, the last Wednesday in each month.

AT the a.g.m. of Bradford and District A.S. the following officers were elected: President, Mr. K. Avison; vice-president, Mr. D. Sugden; secretary, Mrs. S. Stansfield, 16 Hope View, Windhill, Shipley; treasurer, Mr. A. Daugherty; show secretary, Mr. A. D. Fisher, 2 Sherwood Road, Idle Bradford; publicity officer, Mr. D. Conroy; committee men, J. Barford, E. Mothershead, D. Moorhouse, B. Isaacs, R. Stansfield, F. Knighon and G. Sowood. The following were winners of the annual trophies: Thornley Memorial Trophy, L. Gasson; Junior Trophy, L. Mothershead; A.O.V. Trophy, A. D. Fisher; Open Show Shield, D. Sugden; Fish of the Year, A. D. Fisher; Home Aquarium, C. Bullock.

AT the a.g.m. of the Wyke Show Society in January the following officers were elected: Chairman, A. Frisby; treasurer, J. Sturford; secretary, G. Frisby; show secretary, N. Metcalf; committee members, T. Brown, G. Brown, H. Bibby, M. Ashton; junior representative, T. Gould. A discussion about the future of the Club and three table events was the main topic at the second meeting of the month. Results of the table events: Fish of the Night (A.O.V. Catfish): 1, R. Gee; 2, N. Metcalf; 3, R. Gee. Seniors: 1, N. Metcalf; 2, Mr. and Mrs. Brown; 3, M. Miles. Juniors: 1, S. Croushaw; 2, R. Laverick; 3, T. Gould. Meetings are held on the 2nd and 4th Thursday of each month at 7.30 p.m. in the "Rose" Public House, Beverly Road, Hall.

MR. D. SANDS, 114 Hesketh Lane, Tarleton, Preston, Lancs. (tel: Hesketh Bank 2707) has been appointed Organiser Elect of the Federation of Northern Aquarium Societies, to look after the B.A.F. matters until the a.g.m. of FNAS on 8th March, at the Bavarian Hall, Belle Vue, Manchester.

ON 13th January the Fleetwood and District A.S. had their a.g.m. and the committee is as follows: President, Mr. David Sand, vice-presidents, Mr. Barry Black, Mrs. Wendy Kenyon and Mr. Barry Kenyon; chairman, Mr. Charlie Burman; treasurer, Mrs. Sheila Frost; secretary, Mr. Ben Frost, 123 Chastworth Avenue, Fleetwood; assistant secretary, Mr. Keith Quibell; show secretary, Mrs. Avril Stanhope, 6 Rhyl Street, Fleetwood; social secretary, Mr. Walter Beemwell and Mr. Rory Hargreaves; raffle officer, Mr. Ken Burman, P.R.O., Mr. Mick McGinley; committee member, Mr. Philip Stanhope.

Although the Society has only been restarted 18 months, they had a lot of success in 1980. They had fund raising and bought a slide projector and screen, gave slide shows to Broadwater House for the mentally handicapped, the physically handicapped, home for disturbed children, Thornton and the Widows Association, Fleetwood. Provided fish, plants, equipment, etc. for Broadwater House, Red March School for severely handicapped children, Lakeland View, home of physically handicapped. Started to produce a monthly newsletter, bought their own badge, had two discs and buffets, a trip to Duncaster Aquarist Festival and British Aquarist Festival, same seventh in the Show League. They also put on their first open show. To everybody they would like to say thank you for helping. They not only helped to spread fishkeeping as a hobby but also to be able to bring the joys of fishkeeping to those less fortunate. Meetings are now held at the St. John Ambulance Hall, Orange Road, Fleetwood every second and fourth Tuesday in the month, starting at 8 p.m.

AT the a.g.m. of Sherwood A.S. officers elected were: Chairman, Mr. J. Colley; secretary, Mrs. K. Waite, 25 Brookway Drive, Mansfield; treasurer, Mr. A. Griffin; show secretary, Mr. A. Smith, 71 Southwell Close, Kirby-in-Ashfield; social secretary, Mr. M. Waite.

## SCOTLAND



AT the a.g.m. of the Stirling A.S. the following officers were elected: President, B. Shepherd; vice-president, A. McKenna; treasurer, A. Waudby; secretary, N. MacFarlane; senior committee member, J. Tervon; junior committee member, M. Goodwillie. Meetings take place in the Riverside Day Centre, Stirling, on Tuesday evenings at 7.30 p.m.

# Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

## MARCH

- 1st March: Knaithley A.S. open show at Victoria Hall, Knaithley, Yorks.
- 1st March: Association of Midland Goldfish Keepers. General meeting and table show for most attractive goldfish. The Folehill Community Centre, Coventry. 2.30 p.m.
- 8th March: Worktop Aquarist and Zoological Society annual open show, at the Lady Margaret Hall, Holbeck, near Worktop. Show schedules and details, tel. Worktop 81365 or Gainsborough 680616.
- 12th March: Weymouth A.S. tape and slide show on Tetras or Guppies.
- 14th March: at 2 p.m. sharp at the Meeting Rooms of the Zoological Society of London, Regent Park, N.W.1. The British Aquarist Study Society present "The Sharks". A series of illustrated talks on marine and freshwater, ocean and aquarium sharks by members of the Fish Section of the British Museum Natural History and members of the Society. To be followed by a practical observation of the living fishes in the London Zoo Aquarium. Tickets, available in advance from: W. E. Goodwin, 14 Dawlish Drive, Devon Park, Bedford, or at the door.

- 22nd March: Ryeport A.S. open show at St. Edwards Church Hall, Ivy Street, Runcorn. For information schedules, Ruth Muckin, 23 Adria Road, Runcorn WA7 4TU (Tel: Runcorn 76099).
- 22nd March: Workington & District A.S. 2nd open show at the Carnegie Arts Centre, Workington. Further information from Mr. J. T. Graham, 11 Cross Street, Mosley, Workington, Cumbria GA14 3TW.

## APRIL

- 8th April: Reading and District A.S. annual open show at St. Peter's School, Eridge Road, Earley, Reading.
- 11th April: Catholic Association of Great Britain open show at Raynes Park Methodist Church Hall, Winkleside. Schedules (L.A.E. please) from Show Secretary, T. Cruickshank, 82 Stanley Avenue, Greenford, Middx.
- 12th April: Bishop Auckland A.S. open show at Bishop Barrington School, Woodhouse Lane, Bishop Auckland. Show Secretary: P. Roe, 26 South Road, High Ebbard, Bishop Auckland. (Tel: 0388) 832368.
- 12th April: Kettering A.S. open show at the McKimley Theatre, St. Mary's Road, Kettering. Show schedules from Mr. R. Vickers, 141 St. John's Road, Kettering (Tel: Kettering 519284).
- 12th April: Taunton & District A.S. open show at Corfield Hall, Taunton.
- 12th April: Nelson A.S. open show at the Civic Theatre, Stanley Street, Nelson. Details from R. McKenna (Hon. Show Secretary), 52, Bath Street, Nelson, Lancs BB9 0NP (Tel: Nelson 697450).
- 18th April: Hyde A.S. open show, at The Hattersley Community Centre, Hattersley Road East, Hamersley, Hyde, Cheshire. Booking 12 till 2.
- 26th April: Merseyside A.S. open show, at the Rainhill Village Hall, Rainhill, Lancashire.



**26th April:** Skegness & District A.S. open show, at Imperial Cafe, North Parade, Skegness, Lincs. Judging 2 p.m. Inquiries to Mrs. G. Farr, 6 Albany Road, Skegness.

**26th April:** Malvern & District A.S. open show. Schedules from show secretary, D. Franklin, 179 Tudor Way, Dines Green, Worcester.

**26th April:** Yeovil & District A.S. open show at Parish Hall, Martock. Details and show schedules (S.A.E. please) from T. C. Perry, 316 St. Michael's Avenue, Yeovil, Somerset BA21 4NF.

**26th April:** Merseyside A.S. open show at the Rainhill Village Hall, Rainhill, Lincs.

**26th April:** Stanley A.S. 7th open show at Stanley Youth Centre. Information and schedules from Frank Bell, 9 King Terrace, South Moor, Stanley, Co. Durham (Tel: 0207-39831). Club meetings every 2nd and 4th Wednesday 8 p.m. at Church Hall.

## MAY

**2nd May:** Southend, Leigh & District A.S. open show. Schedule from J. London, 145 Whitmore Avenue, Stifford Clays, Grays, Essex.

**3rd May:** British Kai Keepers Society a.g.m. at the Leicester Centre Hotel, 1 p.m. Membership Secretary: Mrs. C. Mullins, Woodlands, South Avenue, Langdon Hills, Basildon, Essex SS16 6JG.

**10th May:** Throckley A.S. open show at the Grange Welfare Association, Newburn Road, Throckley. Benchings 11.30-1.30 p.m. Judging 1.45 p.m. Details (S.A.E. please) from Show Secretary, Mrs. D. Laker, 61 Hewley Crescent, Throckley, Newcastle-upon-Tyne NE15 9PX (Tel: 0632 877236).

**10th May:** Association of Midland Goldfish Keepers. Folehill Community Centre, Coventry at 2.30 p.m. General meeting and table show of adult Fancy Goldfish.

**10th May:** The 3 Counties annual closed show will be held at Eastthorpe Community Centre, Rectory Lane, Bracknell. Show secretary, Pete Abbott, 24 Halewood, Bracknell. (Tel: Bracknell 55289) for information.

**10th May:** Port Talbot A.S. open show at the Talbach County Centre, Margam Road, Port Talbot, West Glam. Schedules early March from Show Secretary, A.E.B. Fawcett, 3 Cross Street, Velindre, Port Talbot, West Glamorgan SA11 1AZ.

**17th May:** Corby & District A.S. open show to be held at the Festival Hall, Corby. Show schedules available from Ron Wilson, 33 Larrat Road, Weldon, Northants. (Corby 2848).

**17th May:** Midway A.S. Open Show at the Scout Hall, Tansbury Avenue, Walderslade, Chatham, Kent. Full details from: Mr. G. Carpenter, 46 Tennyson Road, Gillingham, Kent (Phone 0634 574424).

**17th May:** Bournemouth A.S. open show at Kinross Community Centre, Pithams Park, Kinross, Bournemouth. Details and schedules (S.A.E. please) from Jack Jeffery, 30 Brasemar Avenue, Bournemouth BH6 4JF, Dorset after 1st April.

**24th May:** Bridlington & District A.S. open show, at Hilderthorpe Junior School, Shaftesbury Road, Bridlington. Details and schedules from Show Secretary, G. Spiller, 23 Westwood Road, Bridlington (Tel: 0262 561793).

**31st May:** Maclefield Aquarists Society open show. Details from Show Secretary, Mrs. P. Tomlinson, 14 Minor Avenue, Lyme Green, Sutton, Maclefield.

**31st May:** Redcar A.S. open show at Coatham Memorial Hall, Coatham Road, Redcar. Benchings 12-2 p.m. Schedules from the secretary, D. Readman, 1 Lovat Avenue, Redcar, Cleveland TS10 5DS (Tel: 0642 474854).

**31st May:** Sutton and District A.S. first open show.

**31st May:** Mid-Sussex A.S. first Open Show, at the Sidney West Sports Centre, Leylands Road, Burgess Hill, W. Sussex. Information from Mr. T. Teater, 19 Cyprus Road, Burgess Hill, W. Sussex RH15 8DX (phone: B. Hill 48258) or Mr. L. Pinner, 33 Bunslocks Drive, Burgess Hill, W. Sussex (Tel: B. Hill 48258).

**31st May:** North Avon A.S. 2nd open show in 'The Hut' on the A38 (near 'New Inn') at Patchway, Bristol.

## JUNE

**7th June:** Accrington A.S. open show at New Jerusalem School, Hargreaves Street, Accrington (opposite Police Station). Further information from J. Holding, 146 Dewey Street, Accrington (Tel: 34204).

**7th June:** Loughborough & District A.S. open show at Bunting Community College, Thorpe Hill, Loughborough. Schedules (available March-April) from C. Taylor, 33 Shakespeare Street, Loughborough.

**7th June:** Whiby & District A.S. open show at the Spa Pavilion, Whiby. Details from Mrs. A. Forbes (secretary), 12 Lockton Road, Whiby.

**7th June:** Accrington & District A.S. open show at New Jerusalem School, Hargreaves Street, Accrington. For further information ring Accrington 34204.

**14th June:** Gt. Dunmow A.S. Open Show at Fookles Hall, Gt. Dunmow, Essex. Details from Mrs. P. Peary, 5 Randall Close, Gt. Dunmow, Essex.

**14th June:** Northwich & District A.S. open show at Hatfield High School, Greenbank Lane, Chester Road, Northwich, Cheshire. Details from Show Secretary, D. Valantine, 43 Hatfield Road, Davenham, Northwich, Cheshire. (Tel: Northwich 4624).

**20th June:** Nailsea and District A.S. eighth open show at Clevedon Community Centre. Show secretary: P. Fichett, 2 Woodland Road, Nailsea, Bristol (Tel: Nailsea 852096).

**28th June:** Sherwood A.S. open show at the Lady Margaret's Hall, Holbeck.

## JULY

**8th July:** Association of Midland Goldfish Keepers. Sunday afternoon visit to a goldfish breeding establishment. Details of membership from Hon. Secretary, Miss G. Kedga, 6 Deansgate, Houghton-on-the-Hill, Leicestershire.

**8th July:** Chard & District A.S. 7th annual open show at Purnham School, Chard, Somerset. Details from E. K. Gray, 65 Henson Park, Chard, Somerset. (Tel: Chard 4772).

**8th July:** South East London A.S. open show at 141 Greenwich High Road, SE10. For information ring 858 6344 or 692 0283.

**8th July:** Kings Lynn A.S. open show at the Corn Exchange, Tuesday Market Place, Kings Lynn, Norfolk. Schedules from M. Laws, Sun-Ray, West Winch Road, Kings Lynn (Tel: K.L. 63743).

**10th July:** Scarborough & District A.S. open show at Gladstone Road Junior School, Wooler Street, Scarborough. Schedules from R. Stone, 9 Clifton Street, Scarborough, N. Yorkshire (Tel: 0123 68684).

**10th July:** Mid-Sussex A.S. exhibition, at the Sidney West Sports Centre, Leylands Road, Burgess Hill, W. Sussex.

## AUGUST

**2nd August:** Ashby Fishkeepers Society first open show. Show Secretary: R. J. Lark, 23 Bonnedale Avenue, Ashby, Scunthorpe, South Humberside DN16 3EN (Tel: 62780).

**2nd August:** Leicester A.S. first open show at the St. Matthew's Community Centre, Malabar Road, Leicester. Details and schedules from Show Secretary, D. Sewell, 32 Parkdale Road, Thurmaston, Leicester. (Tel: 695365).

**9th August:** Oldham & District A.S. open show at Werneeth Park, Oldham. Information and schedules from A. Chadwick, 9 Bronville Close, Chadderton, Oldham (Tel: 961-652 6207).

**26th August:** Nuneaton A.S. open show at Nuneaton Arts Centre, Pool Bank Street, Nuneaton. Information from Show Secretary, G. Hemmings, 182 Tomkinson Road, Nuneaton, Warwickshire (Tel: 0682 325271).

**30th August:** Castleford A.S. open show at the Woodhouse Hill Working Men's Club, Nurmanton. Schedules from Miss B. Stanall, secretary, 4 Milner Grove, Aireville, Castleford. (Tel: Castleford 599615).

## SEPTEMBER

**12th September:** Hounslow & District A.S. open show at the Hounslow Youth Centre, Cecil Road, Hounslow. Information from Show Secretary, T. Bolingbroke, 2 Hillwood Close, Addlestone, Surrey (Tel: Weybridge 44976).

**12th September:** Bristol A.S. coldwater fish show at St. Ambrose Church Hall, Stretford Road, Whitehall, Bristol, 3-5.30 p.m. Details from I. Midden, 87 St. John's Lane, Bristol BS1 5AB (Tel: 0272 712363).

**12th September:** North Wilt A.S. open show. Details from Show Secretary P. Taylor, 7 Ridgeway Road, Stratton, Swindon. (Tel: 824114).

**20th September:** Tonbridge & District A.S. open show at Hadlow Community Centre, Hadlow. Schedules from A. Frost, 3 Pollards Wood Road, Nr. Oxted, Surrey RH8 0JN.

**27th September:** Wolverhampton A.S. open show at the Odley Community Centre, Marsh Lane, Wolverhampton. Details from Show Secretary, Pete Winnick, 26 Easington Way, Wolverhampton (Tel: Wolverhampton 53979).

## OCTOBER

**4th October:** Newbury and District A.S. open show at the Corn Exchange, Market Place, Newbury, Berks. For more information contact the Show Manager, Robin Cassin, 6 Southend, Cold Ash, Newbury, Berks. (Tel: Thatcham 64234).

**11th October:** British Cichlid Association convention at the Meeting Rooms, Zoological Society of London, Regents Park, 2.0 p.m.

## NOVEMBER

**1st November:** Halifax A.S. open show. Benchings 12-2 p.m. Schedules (S.A.E. please) from David Shields, Cobblestones, Gaiety, King Cross, Halifax.

# CROYDON AQUARIST SOCIETY ANNUAL OPEN SHOW

★ GOLDEN JUBILEE ★

SATURDAY 28th March 1981

Ashburton School, Ashburton Road,  
Shirley, Nr Croydon, Surrey.

Details from:

Les Derrick (Secretary)

5 Glenthorne Avenue

Shirley

Surrey

Tel: 01-654 0984

Jeff Hooper (Chairman)

96 Richmond Road

Thornton Heath

Surrey

Tel: 01-689 8911

