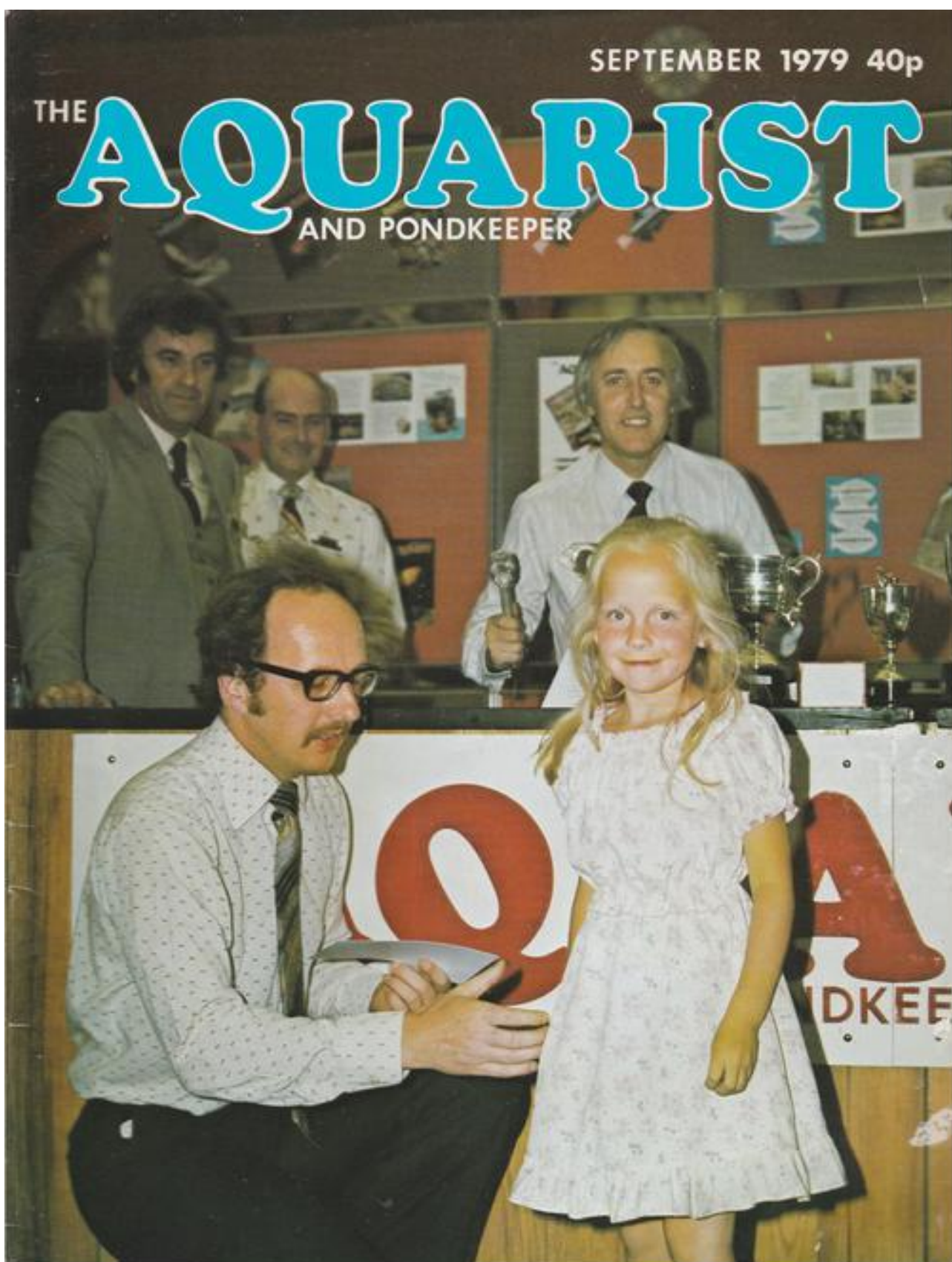


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THE AQUARIST

AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

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receiving award from Michael
Fish. Messrs. L. Brazier, Colin
Richards and R. Mills of FBAS
in background.

September, 1979

Contents

| | PAGE |
|--------------------------------------|------|
| Our Experts answer: Tropical Queries | 24 |
| Coldwater Queries | 27 |
| Marine Queries | 30 |
| What is Your Opinion? | 31 |
| Commentary | 38 |
| From a Naturalist's Notebook | 42 |
| The Aquarist Fishkeeping Exhibition | 44 |
| Coldwater Jottings | 50 |
| Killifish (3) | 52 |
| Disease Queries | 56 |
| The Jack Dempsey | 58 |
| Memory in fish | 61 |
| Waterlily Hybridization | 63 |
| Readers' Letters | 65 |
| News from Societies | 66 |

The Editor accepts no responsibility for views expressed by contributors.

23



OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE

All queries **MUST** be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

TROPICAL QUERIES



Corydoras aeneus

I have a small colony of *tubifex* worms established in my tank. Can you tell me how to eradicate them without emptying the tank and starting all over again with new compost?

Introduce a few corydoras catfish into the tank. An easy one is *C. aeneus*, the bronze type or the albino variety. *Corydoras* catfish will, unless better food is more readily available, soon dig down and eat all the worms they can find.

I should like to know the full size, eating habits, country of origin and general behaviour in captivity of *Luciocephalus pulcher*?

L. pulcher reaches a length of about 7 in. It demands live food in the shape of various aquatic larvae, swallowable living fishes, small crustaceans and the like. It is not always an easy species to keep in captivity unless it is given spacious quarters, frequently freshened and well-filtered acid water maintained at a temperature in the upper seventies to low eighties (°F). It appears to be fairly widespread over Malaysia and Indonesia.

I should like to grow some stems of watercress in my tank. I have some stems in a jar. They have developed plenty of fine roots.

by Jack Hems

Dismiss the idea from your mind. After a few days in the aquarium, the plant will turn a sickly greenish yellow and foul the water. Watercress will ruin a tropical aquarium but not a salad.

I am about to repaint the wooden frames of my sitting room windows. How can I guard against the lethal paint fumes killing my tropical fish?

Reduce the level of the water in your aquarium by a few inches to increase the atmospheric oxygen-carrying capacity in the cover space, and then seal the area between glass cover and frame with folded strips of wet newspaper. Switch off the air pump. Provided the tank is not stocked to capacity with fish the latter should be quite all right for a day or two. While painting is going on keep the room well ventilated. When the paint is dry and the fumes are less noticeable, the cover glass can be opened up to let in fresh air. Do not switch on the air pump for a week or two unless the air pump can be accommodated outside the room and the fresh air led into the aquarium by means of a long air-line.

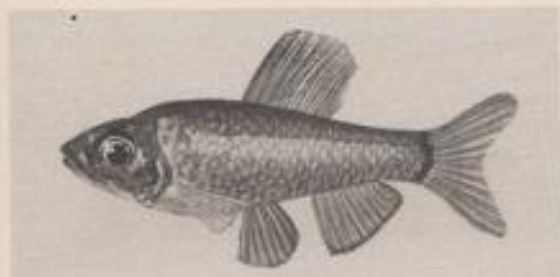
Is it possible to raise *Daphnia* under artificial conditions? I should like to raise them to supplement my fishes' diet of flake food and whiteworms.

It is possible to breed *Daphnia* indoors or outdoors but breeding enough of them to keep even a score of small fishes supplied with the crustaceans all the year round is a tall order. For one thing, a tank holding several gallons of water is an essential requirement, and this for indoor culture. Outdoors an old kitchen sink or two will do. After the water in the containers has matured, introduce some rotting lettuce leaves, a thin slice of raw potato or pinches of dried blood (as used for horticultural purposes) and then the 'fleas.' They will feed on

the microscopic life produced by the rotting organic matter. Green water is also beneficial. It is hard for the beginner to judge how much vegetation or dried blood to add to keep the culture going and healthy. Too little food and the *Daphnia* will make no progress; too much and the water will become unwholesome and the *Daphnia* will die. All in all, containers of whiteworms are the best proposition.

What is a Congo cichlid?

Congo cichlid is just another popular name for *Cichlasoma nigrofasciatum*. In different places, *C. nigrofasciatum* has been (and is) called the zebra cichlid, the striped cichlid, the black-banded cichlid, and a popular name which I fear to put in print because of the delicacy of race relations.



Neolebias ansorgei

Please can you give me some information on what I believe is a rare Characin known to science as *Neolebias ansorgei*?

The genus *Neolebias* has been split from the *Characidae* and is now included in the family *Citharinidae*. The fish was known to keen fish fanciers more than 40 years ago and before World War II was bred by the late Arthur Derham. It is an African species and attains a length of about 2 in. A spacious aquarium is needed because *N. ansorgei* likes to inhabit its own chosen area of territory. Illumination should be bright yet shady in places. A suitable temperature is about 75°F (24°C) and any small live food is accepted. At full size the sexes are not difficult to tell apart.

Is it true that hydras can be removed from a tank by introducing certain species of gourami?

I believe all species and varieties of *Trichogaster trichopterus* make very efficient hydra eradicators.

Please let me know the scientific name of the skunk catfish?

The name skunk catfish is applied to *Corydoras arcuatus*.

What is the recommended food for the fry of pygmy sunfish (*Elassoma*)?

Freshly hatched brine shrimp, sifted *Daphnia*,

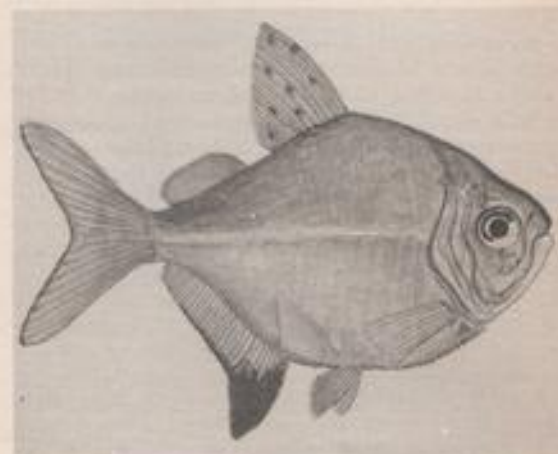


Elassoma evergladei

and any of the small forms of pond life such as rotifers and cyclops.

Will it weaken my vallisneria plants if I cut away the runners put out by them?

Not at all. If you cut away the runners, with few inches' tall baby plants intact and ready for planting out in other parts of the aquarium, you will strengthen the mother plant and encourage her to put out more runners.



Metynnis schreitmulleri

Would *Metynnis schreitmulleri* make a suitable occupant for my community tank?

The answer is yes if you do not mind your plants being chewed to shreds. Species of *Metynnis* are avid eaters of greenfood. Young ones do not do much noticeable damage. Large ones do.

Would the introduction of catfish spoil my chances of breeding and rearing angel fish?

It would not be wise to introduce any other fish into a tank set up for a pair of angel fish, sexed and ready for breeding. Angel fish are temperamental, and even if the catfish kept on the bottom most of the time the extra activities of the catfish at night would upset the angel fish and, in point of fact, might mean the destruction of all the eggs and, if these hatched, the fry.

Can you recommend a publication dealing with the care and spawning habits of anabantids?

The book to satisfy your requirements is *Anabantids, Gouramis and Related Fishes* (a TFH Publication) priced at about £3.60 and obtainable from at least two dealers in books who advertise in our magazine.

I should like to set up a community of 'sharks' in a 48 in. x 16 in. x 12 in. tank. What do you think of my plan?

Very few species of 'sharks' will live on friendly terms with others of their own kind. Ordinarily they quarrel every time they meet. The silver shark, which appears to keep itself to itself, might live at peace with a ruby shark or a red-tailed black shark. Also, young all-black sharks are fairly placid. However, it is rather asking for trouble to place several 'sharks' of the same species in a tank, or 'sharks' of different species and of different sizes together.

Structural alterations have been made to our neighbour's house. In consequence our water supply now has to flow along an extra 50 ft. of copper piping. Will this amount of copper in contact with the water poison my aquariums, that is after topping up or refilling them completely?

Before using any of the mains water for your tanks let the tap run for about seven minutes to flush away all traces of copper salts. After the water has run for a time, it should have no untoward effect on your fishes.

I read an advertisement in your magazine about large severums for sale. I cannot find any reference to severums in my books, so please could you tell me what they are like in colour and size?

I am afraid the books you have are sadly lacking in the sort of information commonly found in books dealing with the tropical aquarium. For the severum (*Gichlasoma severum*) has been known in aquarium circles for about 50 years. It is native to north-eastern South America and the Amazon Basin and is found in shades of olive-green (almost grassy green when young) adorned with dark vertical bars. The bars are very pronounced in severums under six months old. As the fish increase in size the bars assume a more shadowy appearance. The male is characterised by horizontal rows of red spots and larger and more pointed dorsal and anal fins. Up to a size of about 2½ in., the severum is docile enough to share a tank with peaceable species. Larger fish, however, soon develop into bullies. A full grown severum attains a length of about 7 in.

I was sold a fish called *Leptobarbus* some few weeks ago, but now my dealer is not certain if the fish in question is identical to the species he ordered. Could you please give us a rough description of this fish?

Leptobarbus hoeveni is native, as far as I know, to Sumatra and Borneo. It is a cyprinid, silver in colour, with dark edges to the scales. A dark blue lateral line adorns the sides. A dark-blue spot is present behind the gill-covers. There are barbels on the mouth. Caudal, anal and ventral fins are flushed with red. Caudal and dorsal fins have dark tips. Maximum size not known to this writer. The fish is easy to feed and is comfortable at the usual range of temperature. In its smaller sizes, at any rate, it is quite suitable for a community tank.

A fortnight ago, I stocked a 48 in. x 15 in. x 12 in. tank with one *Tilapia mariae*, one blue acara, two oscars, one angel fish and one pictus catfish. My problem is too much algae floating free in the water and clouding the viewing glass. I have tried plants in the tank but the fish just tear them up. The tank is lighted by bright fluorescent lights. What can I do?

It is a pity you did not seek some advice from a knowledgeable dealer before you set up your tank and introduced such a strange assortment of fishes. Green algae is certain to smother everything in an unplanted tank if the light is bright. Your cichlids, as I guess you have found, are avid eaters of dried, flesh and live foods, and so create plenty of nitrogenous wastes conducive to algal growths. A first class filter system would help keep the water clear, but I fear that sooner or later algae will become the least problem in your tank. Your greater problem will be that the oscars will bully the blue acara, the angel fish will just waste away after repeated attacks by the tilapia or the oscars or both. And this is not all. The pictus catfish will not live long in such an unhappy environment. I suggest that you read some of the good books on tropical fishkeeping and make a fresh start.

How is *Barbus conchonus* distinguished from *B. stoliczkanus*? I have come across both species in dealers' tanks and the fish look alike to me.

These barbs may look much alike in general outline and basic body colours, but the rosy barb (*B. conchonus*) reaches a length of about 4½ in.; whereas *B. stoliczkanus* seldom exceeds half this size. There are other differences in well-grown fish too. *B. stoliczkanus* has a pronounced black blotch behind the gill-covers as well as a similar blotch bordered with gold at the root of the tail. The large silver scales are dark-edged and, in certain lights reflect green and blue tints.

COLDWATER QUERIES

by Arthur Boarder

I have tried several times to keep Pike in a large tank but have never been able to get them to feed and have had to return them to natural waters. Why will they not feed?

If you are trying to keep fairly large Pike in a tank, I think that you are expecting too much. Small Pike, say up to two years old could be kept in a large tank, and very handsome they are too; but larger Pike need so much space that only a public aquarium would be able to cope with them. You must also realise that Pike take a whole fish at a time and in their large stomachs they are able to digest the fish over a long period. If the fish you caught had had a meal recently, it is probable that it would not need to eat again for a few days. While digesting a large fish it would have no need to eat any more. The usual fishes eaten by Pike are: Dace, Roach, Rudd, Gudgeon and Minnows. Young Pike can be fed on earth worms. It may be possible to get these small Pike to eat flake food mixed with chopped up worms. This is how Sun Bass can be encouraged to take flake food.

Can you tell me how long a goldfish lives? I have had one for ten years and it is getting sluggish and keeps by itself. Shall I take it from the pond and keep it in an indoor tank?

Goldfish are like human beings, with regard to their length of life. Some die early others much later. So much depends on the way they are kept. In healthy conditions a goldfish can live for over twenty years. Your fish may not do as well in a tank as in a healthy pond. However, if it lives until the autumn, it may be safer to take it indoors, as if we get another winter like the last, it may not survive out of doors.

I have some goldfish in a tank but am unable to get any type of live foods for them. Can I keep them alive on a dried food?

There is no need to worry. You can keep the fish healthy by feeding with a good flake food only. I have some Fantail goldfish in a tank which have been fed exclusively, once a day with a small amount of a well established flake food, and this for over five years. During this time they have not seen anything in the form of live food. They are perfectly happy and healthy. The tank is well planted and so they can always get something in the form of soft vegetation if they so desire.

I have a small submersible pump in my pond to work a fountain and a water fall. I keep it on for ten hours a day but it keeps breaking down. Do you think I need a more powerful pump?

As the water has to be raised three and a half feet for the water fall, I am sure that your pump is not powerful enough for the job. It is quite adequate to work the fountain but to expect it to work the water fall as well is very optimistic. I am sending you an address from where you can get a suitable pump. Inform the dealer of your requirements and he will know which is the best pump for your purpose. I trust that the inlet to the pump is not too near the bottom of the pond, as if it is, it could become choked up with detritus.

What are the black patches which appear on Golden Orfe. Is it a disease and can it be cured?

I do not think that the black patches are a sign of disease and have had these marks appear on Orfe which are perfectly healthy. They are just a colour pigment change, and usually appear on the backs of the fish as they get older. There is probably something in the make up of these fish as they are actually a sport from the original Silver Orfe, or Ide (*Idus idus*). In parts of the Continent almost all the young of this species turn golden.

What is the best medicine to use in a pond to kill gill flukes on fishes?

There is no chemical which can be put in a pond which would kill Flukes without also killing the fishes. In any case I think that the introduction of any so-called chemical cure is a very chancy business. Although one might try to keep to the makers' instructions, there are very few garden ponds, especially if well planted, which could be exactly measured for their capacity in water. Fishes which are attacked by gill flukes must be treated out of the pond. One method is to immerse the fish in a solution of a half teaspoon of Dettol to the gallon of water. This will kill the Flukes immediately, as it will fish lice. However, great care must be taken or the fish could be killed. Only let the fish remain in the solution for a few seconds and if it becomes distressed and turns over, return it at once to fresh water where it will soon recover.

We are told that when changing water for a tank it should be treated. Does this not also apply to pond water?

I am not sure what you mean by being treated. Providing tap water does not come through copper pipes, there is no need to treat it either for a tank or a pond. I have used fresh tap water for fish tanks and ponds, on and off, for the past eighty years and have never had any ill effects from doing so as far as the fishes are concerned. I change a third, roughly, of the tank water every week for fresh. The tap water is poured into the tank from a water-can fitted with a fine rose. The amounts usually put into a garden pond, are so small in relation to the content of the pond that no harm will ensue. During warm weather when a pond is being topped up, it is a good plan to stick a garden fork into the ground near the pond and tie a sprinkler hose on it so that the water gets well oxygenated and it will also remove chlorine from the tap water.

I have been told that fish expel something into the water which inhibits their growth. Is this so and how can it be removed?

Fishes expel waste matter from the results of the food they eat. This waste matter is used up mostly by the water plants or by bacteria in the base compost. If fishes were kept and well fed in a tank with no subsoil or plants, it is probable that if the water was never changed, it could become so unhealthy that the fish would not thrive and eventually die. However, the weekly changing of some of the water and the presence of water plants will keep the water in good condition.

I have found difficulty in keeping some of our coarse fishes as they do not seem to want to eat anything I offer them. Have you any suggestions as to encouraging them to eat?

First of all one should find out what the fishes feed on in their natural habitat. If you know from where they came, it may help to know what baits are used to catch them. I have found that the same species of fish may eat something quite different in another water. I remember when fishing near Tring, before the first war, I could catch fine specimen Roach in the reservoir with boiled wheat but if I used this in the canal close by, which was fed by the reservoir, I could never get a bite. Yet if I used small pieces of cheese in the canal, this was a deadly bait but never got a touch in the reservoir. One important point to watch in feeding such fishes is that you do not try to feed them too soon after they have been put in the tank. A few days should always elapse before any food is offered; most healthy fishes will eat once they get hungry, but they must have a chance to settle down before doing so.

Can you tell me something about keeping Bubble-eye goldfish please? I have a tank with Moors, Orandas, Pom-poms and Bubble-eyes. I have no sharp rocks in the tank but wonder if the other fish will harm the Bubble-eyes?

You did not state the size of the tank, nor that of the fishes. These varieties all appreciate some warmth in the water but should be all right in a living room especially if there is a lamp on over the tank for some hours a day. It is surprising how even a 25 watt lamp will warm up the water in a medium sized tank. The Bubble-eyes should be all right as long as they are able to compete with the others for food. However these fish are rather liable to get trouble with eating. I knew a very good aquarist who had some fine Bubble-eyes and a couple of them suddenly developed trouble which prevented them from closing their mouths. Their mouths remained permanently open, and I suspected that it may have been caused by the extraordinary development of the eye sacs which affected the muscles of the jaws. See that you have only an inch of length of fish, not counting the tail, for each 24 square inches of surface area of water.

Do you know anyone who carries out post mortems on fishes?

I do not know anyone who obliges now-a-days. A Mr. Cotton used to advertise in *The Aquarist*, that he performed this useful task, but I have not heard of him for some time now. I would be obliged if anyone could tell me where such a useful examination is carried out and where I could advise enquirers to send. There may be an Aquatic Pathology Dept., at one of the Universities willing to take on this, and if so please inform me of particulars.

I would like to construct an indoor pool, 6 ft. x 3 ft. x 2 ft. deep. It will be sunk in the floor as there is a basement below. What type of filtration, planting, illumination and number of goldfish will be adequate?

No filtration should be necessary as long as you do not over-stock with fishes nor over-feed. You can use the following water plants: *Ceratophyllum demersum*, *Lagarosiphon major* and *Vallisneria spiralis*. No base compost will be necessary as the plants can be set in containers, the first named can be in a weighted plastic net bag, as it makes no roots. For lighting, rig up a lamp with a hood so placed that it shines across the pool. Its base can be camouflaged with indoor plants, such as ferns. Six two inch goldfish will be enough, and with discreet placing of indoor plants around it, the pool can be made very attractive. Never give too much food at any time and the water should remain clear.

I have recently set up a 4 ft. tank for cold-water fishes and would like to breed red Fantails, and calico Fantails or calico Veiltails. Can you tell me where I can get some good stock and give me any necessary information on the project please?

I am enclosing an address where you can get the fish you require. However, I must warn you that it will not be easy to breed fancy goldfish with the one tank you have. In the first place the three varieties of fancy goldfish you mention, will all breed together and give you a lot of odd types. You must have only one variety in the tank. You will also be up against the possibility that the eggs or fry will be eaten by the parent fish. I think that it is practically impossible to breed the fish you need in one tank. You must have at least two tanks so that when the fish have spawned well in the one tank, the fish can be moved to another tank so that the eggs can be hatched and the fry reared in safety away from the parent fish. From a healthy pair of fancy goldfish, a few hundred fry can be bred and they will have to have plenty of swimming space in which to grow on to good specimen fishes. While very small, say up to an inch long, they do not seem to mind being rather crowded, but after this, unless they can be spread out, they will not thrive. You can use all sorts of containers in which to grow on the youngsters, glass tanks are not essential. I used several old coldwater cisterns and concrete tanks I had made for growing on the fry. Today there are many plastic tubs and containers which would be adequate as rearing tanks.

In early spring I placed a pair of red-cap orandas in an outdoor pond, during a warm spell. Then we had snow, hail and frost. Both the fish are now suffering from fin congestion. What is the cure please?

I have frequently warned pondkeepers of the danger of putting fancy goldfish with flowing finnage into outdoor ponds. Those fancy goldfish like Veiltails, Veiltail moors, Orandas and Pom-poms with a large caudal fin, are not suitable for the garden pond. They may be all right in the summer warmth, but our climate is so unsuitable that it is too chancy to do anything optimistic as leaving them out in the winter. Many of the fancy goldfish are bred in warm conditions and I doubt very much if the ones you had were bred in an outdoor pond in this country. If you keep the fish in a tank with a temperature of about 70°F, for a week or so, it is probable that the fish will improve. There is nothing you can do otherwise which would have any effect on the blood streaks in the tails of the fish.

I have a garden pond with a good sized part around it which keeps very damp. What

plants can I use to give some colour in the summer?

There are many bog plants which you can use and several others which although not classed as bog plants will do very well there. One of the most colourful is the Primula. The species *P. japonica* is especially handsome and will provide tiers of fine flower in various colours. Another good one is the Mimulus, or Monkey flower. The modern varieties are a great improvement over the old cottage garden type and provide a very colourful show during the warmer parts of the year. A very good plant for covering a large damp patch is Creeping Jenny, *Lysimachia nummularia*. This will soon cover an unsightly spot and provide many small yellow flowers.

I am trying to get hold of some fancy goldfish suitable for showing, and so they would have to be fully grown. Can you tell me where I can get them. Also can you give me the address of Aquatic Nurseries where their sales take place?

I think that you will be fortunate to be able to buy fully grown fancy goldfish of a show quality. These are very rare and if obtainable would be very expensive. If you are able to visit some good shows you might be able to get in contact with some of the breeders of winning fishes there. Usually an exhibitor is very rarely inclined to part with fully grown show specimens but may have some young ones to grow on. Exhibiting fancy goldfish is usually a rather lengthy process. I started breeding a particular variety of fancy goldfish in 1937, but it was 1947 before I was able to show them, although the time might have been lessened if it had not been that there were no shows during the war. Look through *The Aquarist* and you will find several firms advertising aquatic accessories in various parts of the country.

I am going to take up keeping goldfish and wondered if there is any information you can give me about the hobby?

I suggest that you get my book, "Coldwater Fishkeeping" from the address of Buckley Press as in the magazine.

In my coldwater tank I have some Bitterling and I would like to breed some. I understand that they lay their eggs in freshwater mussels. I cannot find any near here and wonder if you can tell me where I might be able to get some?

There used to be plenty of freshwater mussels in the canals and they could be spotted by the lines they left in the mud on the bottom. They are more easily found in shallow waters where their trails show up plainly. I do not know any dealers who stock them but you could try: Bio-Pet, Foxton Mews, 48 Friars Stile Road, Richmond, Surrey TW10 6NQ.



MARINE QUERIES

by Graham F. Cox

READERS' SERVICE

All queries **MUST** be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

I recently started a marine aquarium in a 39 in. x 12 in. x 15 in. "GEM" tank. I am using U/G filters covered by cockle-shell and coral sand as you recommend, and using "Sea-Mature" the tank was fully matured within 6 weeks.

Lighting is by one 30 watt "GRO-LUX" tube and my livestock is as follows:

- 1 Domino Damselfish (*D. trimaculatus*)
- 1 Electric Blue Damselfish (*P. coeruleus*)
- 1 Purple lobster (*P. versicolor*)
- 1 Common Clownfish (*A. percula*)

So far I am proud to say I haven't lost a single fish, and my pH, nitrite and nitrate readings are all at perfect levels. Please can you keep me on "the right lines" by answering the following questions:

(1) How do I feed the Purple Lobster? At the moment I leave a chunk of razor meat (gamma irradiated) in the tank for 24 hours and then remove it if the Lobster hasn't eaten it.

(2) Is my lighting alright?

(3) How many more fish can I buy? I would like to buy a Banana Wrasse.

(4) How many invertebrates and sea-horses can I keep and how do I feed them?

(5) Should I purchase an anemone for my clownfish? How do you feed anemones?

(1) *Feeding Crustaceans.* This family of animals mostly makes a living in the sea by scavenging, although there are notable exceptions such as the several groups of obligate parasites and several predatory crustaceans such as the Mantis Shrimps. The so-called Purple Lobster is always a little difficult to feed when first introduced into a marine aquarium owing to the species' secretive behaviour and tendency to hug the rockwork until after "lights out". I strongly advise against the policy of leaving chunks of meat lying around the aquarium for 24 hours at a time. Sooner or later this will lead to

a difficult-to-control disease outbreak due to pollution of the seawater and, eventually, a substantial fluke infestation of the fishes due to a sea-humus build-up in the filter bed.

In maintaining a marine aquarium you must sustain the highest possible standards of hygiene and feeding care—which certainly doesn't mean leaving pieces of animal protein lying around to decompose in the tank. I suggest that, at first, you make no deliberate attempt to feed the lobster. Each time you *lightly* feed the fishes, the lobster, scenting the food will become hungrier and bolder and come a little further out of his lair until, eventually, he will accept a match-head-sized piece of shrimp, prawn, cockle, squid, etc. (—all gamma-irradiated for safety!) placed just outside his cave entrance.

(2) *Lighting.* Your present lighting level is adequate for fishes and crustaceans only. However, if you acquire an anemone, this will make necessary a substantial increase in lighting intensity. A 15 in. deep aquarium requires two feet of fluorescent light per each square foot of surface area. The surface area of your aquarium is approximately three square feet and so you will require six feet of fluorescent tubing as follows:

- 1 x 36 in. GRO-LUX (which you already have)
- 1 x 36 in. NORTHLIGHT

(3) *Stocking.* My advice to anyone starting a marine aquarium from scratch is always the same, as follows:

(a) **FIRST** 6-12 months "Apprenticeship" period —Do not exceed 1 in. of fish to each 4 gallons of seawater.

(b) **THEREAFTER** (i) If you use an undergravel filter only, you should regard 1 in. of fish to each 3 gallons of seawater as your ultimate maximum stocking level.

(ii) If you use a power filter full of ultra high activity marine charcoal as well as an undergravel

Continued on page 55

WHAT IS YOUR OPINION?

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

Photographs by the Author



TODAY IS the longest day/shortest night of the year; and as I begin this month's column at 11.10 p.m. it is still clear enough outside to enable one to read a newspaper outdoors without artificial light. No doubt it won't get very much darker tonight. Despite the fact that today was warm and sunny, one is left with the reality that from tomorrow the days will begin to shorten. I hope that some of the present sunny weather—typical for the period when G.C.E. 'O' and 'A' level examinations are held—will prevail when my school holidays begin at the end of next week. I should then be able to make some time to post samples of a plant to those who sent me requests earlier in the year, even though, I think, I did not offer samples this year!

A point of interest for those who read my comments about the use of the new weedkiller, Tumbleweed, in the garden: it is an excellent product that could be used to clear a weed-infested site for a garden pond (keep the weedkiller well away from the pond). Docks, couch grass, dandelions, annual grass and nettles—to mention but a few species—shrivelled up and died in only several weeks and I was able to work up close to cultivated plants (care must be taken to keep the liquid off the plants one does not want to kill). The soil can be cultivated a week after treatment. I notice a nasty species of alga has developed in one of my tropical tanks; I wish I had an appropriate weedkiller to treat it.

The first of this month's letters will leave its writer somewhat disappointed because he forgot to sign his name; hence I cannot credit him—although I can publish his address and estimate, from his writing, that he is probably between 15 and 17 years old. My apologies, sir, if I am wrong about your age. The gentleman resides at Truro, Cornwall; the first two lines of his address look like Elm Grove, Feoch. In any case, he writes: "I would like to shed a little light on the effects of cigarette smoke on fishes. I had some seahorses which thrived all right in a 24 in. x 15 in. x 15 in. tank with a U/G filter and living rock. All was well until I took up smoking.

"One day I was feeding the fish on frozen *Mysis* shrimp and had a cigarette in my mouth. All seemed

well until the following day when the seahorses showed signs of distress. I didn't know what to do; my aquarium books didn't describe what was happening. Next day they had died. I was very upset because the seahorses had been a present from my grandmother. The only possible cause was cigarette smoke. Later I found out in a book called *Coral Fish*, from my local library.

"The tank now contains the original living rock, an anemone and four small tomato clowns. Now my bedroom contains a No Smoking sign. Fortunately my freshwater fishes had shown no signs of distress—but better to be safe than sorry.

"I have also kept two types of worms: *Tubifex* and micro worms. I obtained the latter from a fish-keeping friend, John Heath. I kept the worms in a well-known brand of butter (*sic*) and two culture dishes, borrowed from my ex-school lab (*sic*). These worms come in handy for feeding Siamese fighting fish babies, guppies, ram babies and baby convict cichlids. The micro worms were kept on porridge. The *Tubifex* worms were kept in an old photographic dish with water constantly washing through it. The worms were placed in a Hykro worm feeder and the freshwater fishes ate them up with great gusto. I must close now so that I can feed my fish." (Our letter writer must have got so carried away by his fish-feeding activities that he forgot to return to sign his letter. Perhaps he, or his friend John Heath, will send me the name for future publication.

A colleague, Mr. George Stainer, is a highly talented artist who also produces some very amusing poems, complete with illustrations, about animals. Unfortunately I am unable to include one of George's drawings but he has kindly permitted me to reproduce one of his poems about fish. I've no doubt that it will appeal both to younger and older readers.

*I think fish is
de-lish-is
I love the way
The flavour of fish fingers
lingers. . .*

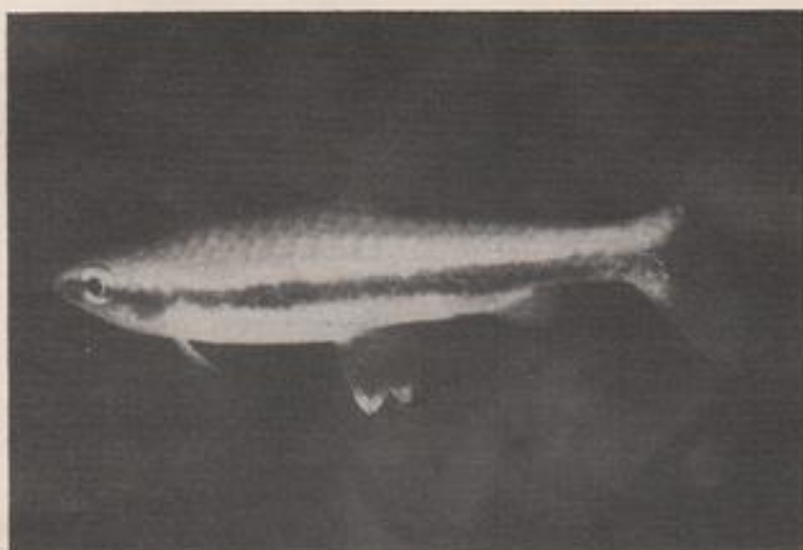
Those who cannot obtain Java moss locally will be pleased to read the following offer that appears in a

letter I received from Mr. D. S. Allen, of 30 Maypole Road, Oldbury, Warley, West Midlands. He writes: "Would anyone like a portion of Java moss? It is slowly carpeting the bottom of my tank. If you would like some, please send a s.a.e. and if by the time your request arrives there is none left, I will send you some when my stock has replenished itself." Mr. Allen continues: "After reading the *W.Y.O.* column in the May edition I noticed Miss Andrews' article. I am pleased to tell her that all male dwarf gouramies that I have seen down here in the Midlands are also of perfectly acceptable shape. I purchased one pair of dwarf gouramies in October 1978. The male was brightly coloured and healthy; the female was in the same condition with bright blue bands running down the flanks. However, unfortunately, three weeks later the female died; no signs of disease or

I found that he had purchased them from a shop.

"Close observation showed that three females, in the days following, were mated with. Twenty-eight days later I watched for fry. The birth occurred on the 30th day; but it occurred in only one female—proving that the other two must have been sterile. Unfortunately the fry were eaten by the other fish in the tank.

"Why is it that people find it necessary wantonly to injure and kill helpless creatures? I read in my local newspaper, the *Birmingham Evening Mail*, that vandals had climbed over a 12 ft. wall of a pet shop and poured a full bottle of an unnamed disease preventive into 150 gallons of water killing 500 koi. The preventive should have been diluted in 2,000 gallons of water. . . ." (The reason is probably boredom; but I can think of no excuse. B.W.)



attack were visible. Since then another two female dwarf gouramies have died after being bought to put with my male. In March once more I tried to pair him off; but in addition I purchased another pair as well. Now both pairs are in excellent condition.

"Reading on further I noticed the comment about brightly-coloured, sterile, female guppies. I run the community tank at my school, taking care of the stocking, maintenance and feeding. It is stocked with guppies, serpaie tetras, a pair of dwarf gouramies, one large blue gourami, a swordtail and two white cloud mountain minnows. All the guppies in the tank I had raised myself; but on going to the school one day I noticed four large, brightly-coloured, female guppies, the large blue gourami and the swordtail. These had been put in by a teacher who was getting rid of his tank and fish. Upon asking him

Anyone wishing to avail himself or herself of Mr. Allen's offer should write directly to Mr. Allen, at his home address, enclosing a s.a.e. and, possibly, a polythene bag. Please do not send me any additional requests until next summer.

Mr. David Collinge lives at 42 Alpha Street, Seedley, Salford, Lancs. and he writes: "May I just make a few comments on the article about dwarf cichlids from the lakes of East Africa, by Lothar Fuchs, in the May issue of *The Aquarist & Pondkeeper*. First of all, I have only been keeping these colourful and interesting little fish since December so I am still a comparative novice; but I have always endeavoured to keep my fish in an environment similar to that which they would find in their natural habitat. So I keep them in very hard and alkaline water (pH 7.9-8.1; 28-32 GH) and many of the pairs I have

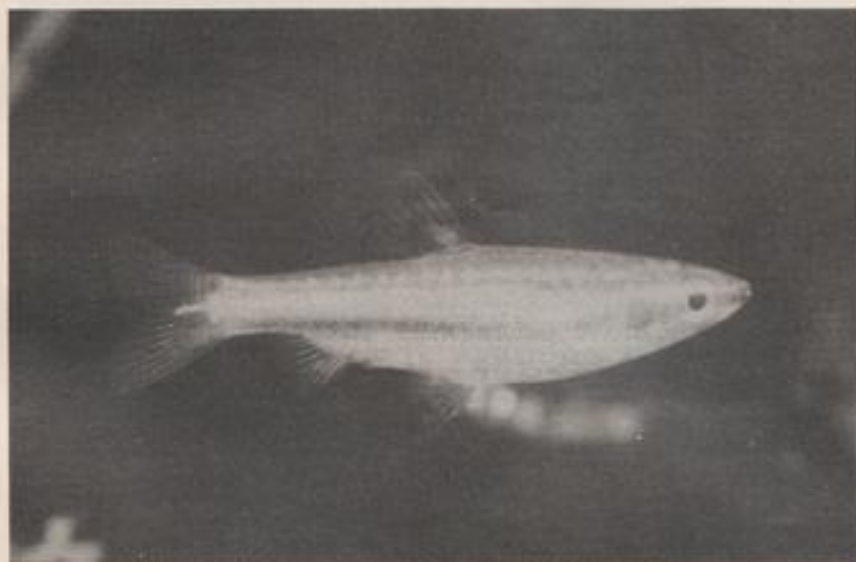
are either breeding or in breeding condition.

"I make this point because the author of the article writes: ' . . . In spite of very hard water 8 GH and 7.5 pH . . .—far less so than mine, you will agree. He gives me the impression that these fish should be kept in water of a softer nature, especially as he states that he filters the water through peat.

"In their natural habitat in Lake Malawi the water is very hard and alkaline; and even more so in Lake Tanganyika. Yet all the dealers I have been to—there are not many I know of in this area—who specialize in these fish don't seem to bother about or try to reproduce the water conditions. So when enthusiasts such as I purchase fish from dealers who keep them in water far less hard and alkaline than they should be kept in and introduce them into our tanks we face the risk of ill health and, perhaps,

been changed into wine; and that the word 'several' would have made more sense had it been preceded by a full stop and begun with a capital letter—to commence a new sentence. Is the GH for German Hardness, measured in degrees and normally written °DH, or does it mean General Hardness? B.W.).

Fortunately most of the fish that we keep in our tanks are very adaptable and can survive—if not thrive—in many and varied conditions. I'm sure that a good many are tank-bred and have never lived in a natural environment. Fish do not usually breed unless the environment is to their liking; and the laws of nature are such that when they do produce fry very few survive to reach maturity to continue the reproductive cycle. That so many species breed in our home tanks probably says much more about the adaptability of the fish than about us as aquarists



even loss, no matter how gradually this is done. These fish are expensive enough as it is. This could be so easily avoided by dealers going to a little trouble to keep them in water conditions I am sure they feel more at home in.

"Finally, Mr. Fuchs writes that he keeps *Pseudotropheus johanni*. May I point out that this fish is now placed in the genus *Melanochromis*. P.S. Is there any chance of a regular article on these particular fish?" (I've just read Mr. Fuchs' article, *Dwarf Cichlids*, in the May issue. I wonder if a typographical error might have crept into the figures in the article—which would appear to have originated in Germany. Part of another sentence in the article: ' . . . and stones from the vineyards, from which our excellent Franconian wire originates several clumps of moor oak . . . ' suggests that the wire should have

with a scientific approach to our hobby. What is your opinion?

Do you have one of those aquarium glass scrapers that one fits with a safety razor blade? The scraper that I use is one that I've had for many years. It was obviously designed for an 'Ever Ready' safety razor blade. Recently I visited a chemist's shop where I tried to buy a couple of replacement blades because my last spare blade was showing signs of rusting. I was informed that the particular blade is no longer manufactured; and I bought a couple of American-made substitutes. Unfortunately they are rather thinner than those for which my cleaner was designed; hence they immediately slip out when placed in the holder. Last night I was searching through some old flowerpots in my garden shed when lo and behold out tumbled an unused 'Ever Ready'

razor blade. Its wrapping was the original blue and white coloured one showing an old man's face. I expected the small, flat package to contain nothing but rusted steel; but I got quite a surprise when I opened the wrappings and found a shiny blade marred only by a little patch of rust at each side. It has solved my problem for the present. I remember my father and my grandfather always shaved with 'Ever Ready' razor blades in 'wet' razors; my father disliked electric razors. 'Made in Britain' obviously meant something in the days of 'Ever Ready' blades. I still don't know how or why an unused blade got into my garden shed and remained undiscovered for so many years. I only wish there had been more of them.

Master Nicholas Moses is 13 years old and writes from 38 Cotton End Road, Wilstead, Bedford. "I

"The other fish I keep are koi and a weather loach. I will soon be setting up a Lake Malawi cichlid tank as I think some of these fish are beautiful and I hope I will be able to breed some. I'd like to know why very few people keep freshwater European fish in aquariums. I have a book about them and have found quite a few fish suitable for aquariums. Could you tell me of a society for cichlid keepers?" (I am sure the British Cichlid Association would be of interest to you, Nicholas.)

Although whales are mammals and not fish, I am sure that most readers share my wonder at these largest, living animals, and my horror at the brutal and thoughtless way in which man, whose greed frequently knows no bounds, has been slaughtering them until the survival of some species is threatened. If you share my views please take every opportunity



wish to tell you about my experiences with the cichlid *Geophagus pellegrini*. I had a pair of these fish which I bought from a local dealer. These fish, as far as I can find out from books, are not suitable for community tanks; but I kept my pair in a 24 in. x 10 in. x 10 in. tank together with an albino *Corydoras* species, two wagtail swordtails, four guppies, four harlequins, one zebra danio and one *G. aymonieri*. The cichlids didn't attack any of the fish and were very peaceful. They have only one annoying habit: digging up the gravel and uprooting plants; but watching them do this is fascinating. I tried to breed them but failed. I have only one now; the other died from white spot.

"The remaining fish now lives with the other fish, together with a lovely catfish called *Mystus tengara*. I have been trying to find another *G. pellegrini* but I cannot find one anywhere.

to express your disgust about those nations who selfishly decide to continue killing whales. It would be a sad day if, to see a dodo, a mammoth, a dinosaur and a whale, we had to visit the Natural History Museum at South Kensington! I feel that we have been allocated about 70 years on this planet and that during our stay we should be able to survive in reasonable comfort without selfishly killing other men and animals, without destroying plants unless there is a good reason, and without polluting the environment to such an extent that future generations—if any—will have to adopt a life-style that would presently cause us to object. If you have not already read the novel *Moby Dick* I recommend that you do so. It's a fascinating story about man versus whale.

Mr. Bill Ross's letter travelled a long distance to reach me. It came from P.O. Box 98, Dhahran Int'l Airport Post Office, Dhahran, Saudi Arabia.

Mr. Ross writes: "In response to your question on angel spawnings in the April W.Y.O., I agree with your comment that spawnings are not uncommon; but, as you say, it is less common to hear about the eggs hatching and being raised to maturity.

"I started breeding angels in 1971 and have been fortunate in breeding many of the coloured varieties of this wonderful fish. I would strongly recommend, to anyone interested in breeding angels, *Angel Fish—the king of the aquarium* by F. N. Ghadially, M.D., Ph.D., D.Sc. (Lond.). This book is full of the required information written in an easy-to-understand manner.

"Over the seven years when I was breeding angels I never found a pair who would raise their own young. I had to remove the eggs and raise them separately. I have read in many books about angels rearing their young but have never met anyone who has witnessed this. I believe the angel today is a much more domesticated creature than the angel we read about in books—and somewhere along the way it has lost its maternal instincts."

Last week, when visiting a city, I called at three aquarium shops. I wanted to buy some rubber/plastic suckers and to have a look around. Have you tried to buy ordinary knob-type rubber suckers recently? The first shop I visited had none; the second had only a couple of clear plastic ones—which I bought; the third shop was able to supply me with the eight I wanted—in black rubber. I also purchased numbers of different ones in each of the three shops and ended up with an assortment of rubber and plastic suckers. So far I have replaced fourteen suckers; others will be replaced when I complete this month's column. The city shops were offering a wide selection of fishes; and when I noticed some of my favourite fishes for sale I could not resist the temptation so I purchased two pairs of *Nannostomus marginatus*, at 55p each, and a pair of *N. anomalus*, at 50p each. These are delightful little fish without any vices and they are not too difficult to spawn. They tend to show off in twos, close together, each looking like the other's shadow. They usually frequent the upper layers of the aquarium and are ideal companions for fishes such as cardinals that tend to stay in the lower levels of the aquarium. Photograph 1 shows *N. anomalus* and photograph 2 *N. marginatus*. Both fish are shown much larger than life size.

Earlier last week I visited the only shop in my home town that stocks tropical fish and I was tempted to buy a pair of scissor-tails and a pair of black widows. The black widows—one of which is featured in photograph 3—turned out to be a lively and vicious pair of tetras (and superb models for fish photography). I kept them in an aquarium with some guppies, cardinals, neons and scissor-tails. Before I removed them two days later they had killed a scissor tail, a neon, a cardinal, several fairly large male guppies

and an unknown number of young guppies. They are now in a smaller tank, alone. I must admit I was tempted to flush them down the lavatory. I was saddened to see, this week, that the shop in which I bought the black widows appears to have closed down. If so there will be nowhere locally to buy tropical fish. Someone once remarked to me that fewer tropical fish are sold in summer because many aquarists are outdoors more often in summer and tend to restrict most of their fishkeeping to the winter months. What is your opinion? I have been outdoors a lot recently, gardening; but the lack of sunshine would certainly not encourage me to be outdoors unless I had work to do there. I am still rejoicing at the introduction of Tumbleweed weed-killer (for gardens).

By the way, younger aquarists would probably appreciate my giving the common and proper names of the three species of fish in the photographs. The first photograph shows *Nannostomus anomalus*, sometimes known as the anomalus pencilfish. The second photograph is of the dwarf pencilfish, *N. marginatus*. *Gymnocorymbus ternetzi* is the correct name for the black widow, shown in the third photograph.

No. 95 Long Lane, Chadderton, Manchester, heads a letter I received from Mr. Frank Garreth. (I'm sorry if I got either your name or address wrong, sir; the writing was a little difficult to read.) The gentleman writes: "I have been a reader of *The Aquarist* now for many years—since about 1950—and enjoy your contributions and ideas exchange. Your columns are very reminiscent of the Raymond Yates columns of many years ago. As you will have gathered, I am an aquarist of many years' experience and therefore feel qualified to comment on some of the letters which have recently appeared. I was active in tropical fish breeding from 1951-1970; from 1970-1976 I simply kept fish I had previously bred, until they all died. I have recently set up all my old tanks—together with some new ones. My usual technique is to buy six to eight young fish of a species I fancy, obtain a good pair and breed them, thus stocking my tanks with shoals of home-bred fish. I think you will agree that a number of the same species looks better and allows the aquarist to get exactly the right conditions for each species. A community tank is all very well but is at best a compromise situation.

"I recently set up a large community tank stocked with groups of six to eight young fish, i.e. characins, rasboras, danios, white clouds etc. I have to date spawned beacons, glowlights, harlequins, zebras, pearls, white clouds and kribensis. All eggs were infertile.

"This brings me round to the highly-coloured, hormone-treated female guppies, the misshapen dwarf gouramies etc. I am convinced that at some stage in their development a lot of fish we buy are

either hormone treated or irradiated with ultra-violet light, either to render them disease-free, or to render them sterile with the obvious result of increasing turn-over of the primary breeder or dealer and to prevent people from stocking their tanks 'on the cheap.' I feel very strongly that science has entered fishkeeping to too great an extent. Until recently I never even possessed an air pump, let alone U/G filters, and my plants always grew in profusion under ordinary lighting, i.e. 36 in. x 12 in. x 15 in. (at 75 watts for ten hours. Now we have 'natural' fluorescent lighting and the plants just don't grow. Years ago we treated diseases with either salt or heat or both, not with broad-spectrum antibiotics. The poor, bloody fish are clinically clean inside and out!

"Regarding killer fish: years ago I was in charge of a small, public aquarium when I had the pleasure of meeting Mr. J. E. Shore of the Osram Society. He brought a large, black, evil-looking catfish which I identified as *Clarias lazera*. A few days later, sporting a bandaged finger, he brought it again and I bought it for the museum for £1.50. It had removed the tip of one finger. The last I heard of it, it was 2 ft. long and in Bolton Public Aquarium—although probably gone by now.

"This fish would eat literally half a muffin with boiled ham, tongue or whatever inside it (half my packed lunch) complete with salt, pepper, mustard or H.P. sauce! I would give anything to obtain another specimen. I think though, as far as killers go, my snakehead would take some beating.

"I must be in a complaining mood today because I have been bemoaning the fact that all the old favourite fish seem to have gone. A list of fish not seen for ages includes: *Danio devario* (much better than *malabaricus*); *Polycentrus schomburgki*; lemon wagtail platies; three-spot gourami (not blue or cosby); *Pristella*; *H. scholzei*; *H. caudovittatus*; *H. flammeus*; *A. rubripinnis*; *Nannacara anomala*; *Heterandria formosa*; common guppies; green swords; red-eyed red swords; Berlin swords; black mollies; *A. tetramerus* (saddle cichlid); *A. portalegrensis* (port or black scara); *H. bimaculatus* (jewelfish); *H. multicolor* (mouthbrooder); and so on."

Raymond Yates

I found this gentleman's letter very interesting; and because I could not remember the writer Raymond Yates I dug out a couple of copies of *The Aquarist* and *Pondkeeper* from 25 years ago (I have even earlier copies but they are not to hand). Those that I unearthed bore on their bright green covers the price 1/6—that's 7½p in 1979 coins. Shirley Aquatics Ltd. had a price list on the back cover of one of the magazines. Some of the prices are of interest: *N. anomala*—25p and 37½p; *N. marginatus*—50p (not much change!); zebras—10p; dwarf gouramies,

unsexed—17½p; clown loach—£3.00; kribensis—62½p; white clouds—12½p; black shark—£15.00; golden guppy—12½p; third-grade male fighters—25p (obviously I've converted prices to new pence). Plants were cheap in those days: *Vallisneria spiralis*—approx. 1p; *V. torta*—2½p; Amazon sword—25p; hair grass—5p; giant *Vallisneria*—17½p; *A. ulvaceus*—12½p. Postage on plants was 5p for orders under 50p. Orders over 50p were post free. In those far-off days Mr. Hems and Mr. Boarder were regular contributors to the magazine; and our present editor, Mr. L. E. Perkins, had numbers of his excellent photographs illustrating the magazine. The May 1954 issue contained an interesting article, *Breeding Crayfish in an Aquarium*, illustrated by our present editor and written by his late brother, Mr. N. E. Perkins.

The magazines contained a regular monthly feature called *Aquarist's Notebook*, written by Raymond Yates. I've just read a couple of the columns and they are as interesting today as no doubt they were 25 years ago. Another feature, *Aquarist at Home*, appeared regularly and consisted of an interview with a famous aquarist of the day. It's a feature I should like to see revived because those of us who live far away from the major shows never have any contact with the best-known aquarists on the mainland.

By the way, I'm pleased to see that Ireland's biggest annual show will be held as usual this summer. *AQUA '79* will be moving back into the centre of Belfast and I've no doubt that it will be as popular as ever. I hope I'll be in a position to include some text and photographs in a future edition of *The Aquarist*.

Seasonal dearth

As is usual at this time of the year, I have been receiving very few letters for inclusion in this feature—although I have plenty of letters to use from earlier in the year. In reply to the lady who asked: yes, I have still not smoked since early March and it is now 20th July; and my sense of smell has improved considerably. I knew fish foods were smelly—but I did not realise just how smelly!

I should like to receive a few lines from you for inclusion in the autumn issues. Send me your opinion on any facet of our hobby that takes your fancy—or on any of the following: (a) fin-nipping fishes; (b) how frequently do you strip down an aquarium, wash the gravel, and set up the tank again?; (c) have you taken any good fish photographs recently?; (d) please send me details of any pencil-fishes that you have bred; (e) how important—if at all—are live foods to fishes?; (f) what plant species flourish in your tanks, and under what kind of conditions?; (g) in what part(s) of your home are your tanks situated and are any of them built into cupboards, etc.?; (h) where do you obtain good aquarium plants?

Commentary

by Roy Pinks

I HAVE been spending an inordinate amount of time lately on pond planning. During the spring, which was all winter, and much of the summer which has been mostly spring, I have sat and thought and consulted authorities about what one should do and when, and I concluded that I had it all worked out. Just as soon as the really fine weather arrived, I would attack the entire project, both invigorated and inspired by what I had read and plotted. The unexpected arrival of almost tropical weather, however, drove me straight into a deck chair where in I did further planning in between sessions of Prudential Cup cricket commentaries, and consequently very little spadework actually got done. In fact, when I ran over the outline programme of work I wasn't at all sure that I had not manoeuvred myself into the position taken up by the snake which finds itself with its tail in its mouth. The source of the trouble was, of course, the involvement I had engineered for myself with my colleague's pond. As I still have his fish—I am anxiously waiting for them to spawn before I hand them back—I deserve very little sympathy.

The chain of events which has to be fulfilled before I can make any progress is something like this: empty the big pond; this requires that one of my small ponds shall be available to take the plants. One of the small ponds contains my friend's fish. The other has no lining and has to be re-excavated to improve shape and depth. Friend's pond is still maturing, and at my insistence has been doing so for several weeks. It is teeming with *Daphnia*. Before I will hand over his fish I need to milk his pond of these valuable creatures and put them into one of my ponds, which will be full of pea green water, so that they can act as a food source for the remainder of this season and the starter for next year. If you follow this carefully you will conclude, as I have, that I am stuck. Experienced readers will also expect me to have devised a solution by next month, and at this stage I hope that their predictions will have been fulfilled.

Natural Maturation

One thing has emerged very clearly out of all this muddle. There have been many local converts to the practice of allowing ponds to mature naturally, avoiding the use of algicides. It so happened that the entire restocking of my friend's pond took place during the period of increasing daylight intensity, and I had daily reports on just what stage of greenness had actually been reached. When all seemed set for the introduction of *Daphnia*, I scoured my rainwater tank with a fine meshed net, confident that a few thousand head could be rounded up. When the final count came to about twelve I was something less than confident, and was prepared to be laughed at when I delivered them. But I sped them on their way with an encouraging word, and this must have done the trick, as the water is now clear as crystal, there must be millions of them, and the neighbours tend to touch their forelocks for some reason as I hasten to and fro on periodic tours of inspection. But it may just be the midges.

The wellbeing of the pond is, however, beyond dispute, and we are all very pleased with the outcome. The relining and the re-paving were done skilfully and the gradual establishment of the submerged plants and the water lilies have provided a great deal of interest, to the extent that there has been no real pressure on me to return the fish. From my own point of view I would like to move them without delay, but it seems worth prolonging the seasoning period in order to let the folks experience fully the finer points of the process, and to judge for themselves whether the predictions and recommendations I made earlier in the season were reliable or not.

Needless to say, we have been devouring some of the trade catalogues during all this planning. I am, incidentally, an avid reader of catalogues and would welcome a regular input from advertizers interested enough to mail me a copy. I was particularly taken with a comment from Mr. Tisbury's highly readable publication, which, whilst offering water snails for sale, made the point that the amount of scavenging

which they do is microscopic, and ponds never appear cleaner because they contain snails. In days of the hard sell, I find this and many other similar shrewd observations immensely uplifting, and catalogues like this will always command the respect they deserve.

Tidying Work

Lest the foregoing should give the impression that I have not got into gear on my own project, I should record that the preliminary tidying work has begun, and I hope to have rendered the three ponds fit for initial stocking by the late summer, which is perhaps the best time of all to carry out this pleasant job. I hope that readers will enjoy reading about the resultant inevitable disasters and that we shall learn a little about pond renovation in the process. One particular matter stands out very forcibly at the outset, and this is the vast amount of pure drudge work which will be entailed in removing surplus and deeply entrenched marginal plants, which will have to be done before the contents of the large pool can be tackled. It is quite incredible how much of a stranglehold some of the rampant growers can obtain on the environs of the pool, and in some cases they will wreck or gravely disturb the foundations. One particular variety of *Carex*, for example, had to be hacked out of the concrete surround of my large pool with an axe, and even this brutal surgery failed to dislodge every root there was, so I expect to have to use some form of total weedkiller to prevent regrowth. In this respect the growers and the main suppliers would do us a considerable service by commenting in their catalogues about tendencies like these. The horror of Water Mint, for example, is never revealed, and even the most experienced growers repeat the recommendation that it always grows where the water is the clearest. That may well be, but in truth it grows anywhere and everywhere, and I cannot eradicate it from my perennial border, so this is one of quite a few species which will never find their way into my future ponds if I have anything to do with it.

Plunging into Marines

I have already sketched some of the difficulties besetting the beginner with marines as regards getting the right sized fish for his tank. Before a decision is made about keeping any of the species, however, it is very important that one should be quite clear as to the scope and limitations of marine fishkeeping. I will except the seaside dwellers who have every opportunity of collecting material from around our shores. These favoured few are able to experiment with a wide range of subjects at hardly any cost, and if they begin to deteriorate the creatures involved can be quickly returned to their native element, wherein they will stand a reasonable chance of recovery.

So far as tropical marines are concerned it must be accepted that the initial and maintenance costs

are high and that the necessary management techniques make greater demands on the aquarist than he will encounter elsewhere in the hobby of fish-keeping. Nevertheless, when some understanding has been gained of what will be tolerated by the various groups of fish most likely to be acquired, stupid and costly mistakes can be avoided and modest progress can be made. The would-be mariner must grasp certain facts very firmly and then stick by them, and an important principle is that all activity should be consciously considered as part of a saltwater technique: suppositions imported from freshwater management experience must be suspect from the outset, and for this reason many of the most successful mariners are those who have never kept fish before.

For the foreseeable future the mariner will have to accept that the breeding of fish will be beyond his capability, and he will thus be keeping marines either for study purposes or for decoration and passing interest. The student will be subject to numerous academic and scientific disciplines, and we may assume that he will progress in an orderly and responsible way, but the average interested but vulnerable aquarist who takes up marines no more seriously than shubunkins starts at a severe disadvantage. It is remarkable just how many pet keepers are always on the verge of setting up marine tanks, but almost to a man they attribute their reluctance to begin to the initial cost, and not to other considerations.

I think that the matter of cost is a bit overdone. True, this branch of the hobby is not cheap, but nothing is these days, and when everything is levelled out over a period, it is probably no more expensive to keep a tank of marines than it is to keep a cat. It may even work out cheaper.

A real bane is the mass of sweeping statements about points of technique, and writer after writer falls into the trap of uttering warnings or advice as axiomatic, based purely on personal experience. While it is right and proper that all available information should be published, that which is written should always be read with reservation. I read some time ago that if you as much as allowed a single flake of food to settle on the floor of your marine tank, all the fish would be covered in harmful copepods within a fortnight. This sort of utter rubbish brings the whole shebang into wrongful disrepute. It may well be that that particular writer had suffered that sad experience, but I am the world's worst collector of aquatic garbage, and I have never even seen a copepod generated from this particular misdemeanour. We have also got to remember that most aquarists are imperfect in some way, most of us in a big way for some of the time, and it is during those infrequent periods of real badness that our systems are most likely to come unstuck. If we recognise these facts

Continued on page 57

From a Naturalist's Notebook

by Eric Hardy

BRITAIN'S declining wetlands, through lowering of the subterranean water-table, continue the most serious threat to many subaquatic plants. Land in England and Wales is now being drained at a rate of a quarter of a million acres per year, the Ministry informs me. Of course, drainage isn't new. The Romans began it in East Anglia and Romney Marsh. But mechanisation has increased the rate from only 30,000 acres a year at the end of the war, and 171,000 acres by 1970. More than half the agricultural land is drained artificially, especially the Midland clays, and drainage is likely to be increased on some 7 million acres, to improve cultivation.

Cheshire's River Gowry has been lowered several feet and in recent visits at Chester's Plemstall Church and Stanlow's Thornton-le-Moors, I notice the loss of many aquatic plants and birds like yellow wagtails and snipe from the water-meadows I knew there before the war. Many trees have suffered from the lowered water-table in the Thornton area. The position is different in Scotland where more influence is being effected by hydroelectric schemes, including the controversial scheme for Ben Lomond despite one already on the west bank of Loch Lomond. This is a pumped storage scheme using nuclear power to pump water up to a reservoir instead of filling it by rain. Mrs. Hannah Stirling of Auchendarroch, Tarbet, by Arrochar, Dunbartonshire is opposing this with a Friends of Loch Lomond organisation.

Trout

In my annual visit to Loch Awe this summer, where the British trout record of 39½ lb. has stood since 1866, I found pike and perch almost as numerous as the game fish. Unlike Lomond, this longest of the lochs, 28 miles by only 2, has no powan or whitefish, and its stony shores are not very rich in water-plants. Locals claim that salmon and trout-fishing are free in the loch below Loch Awe House, the former railway hotel. The old south end fish-hatchery is no longer used, but had its osprey-visitor for the 3rd successive year. A notice 'Beware of Adders' in nearby Glen Nant is probably more meaningful than a similar notice recently repainted and renewed at Clwyd's Llyn Helyg, in North Wales. Beside Glen Nant's Baily Bridge rough forest road, we found a nest of hen-harriers with 5 eggs, and a few miles over the hills, on Loch Nant and 2 adjacent waters, 3 nesting pairs of black-throated divers,

with a 4th pair on the south end of Loch Awe using the island beyond Dalavitch, at Inverliever Forest.

Though water-boatmen bugs are not mentioned in a recent book on natural history in towns and gardens, they fly into large industrial areas at night and several have occupied the smaller freshwater pools by the huge Seaforth grain-terminal dock at Liverpool. At the end of the last war I found whirligigs and other water-beetles established in old air raid emergency watertanks, with only a little bottom water left, in Manchester's blitzed Market Street area, while a *Dytiscus* water-beetle alarmed dancers when it alighted at their ballroom at the top of Blackpool Tower one night. These Seaforth dock-pools are the breeding ground of the common and widespread caddis-fly, *Limnephilus affinis* (which also lives in rain-pools at nearby Kirkby). The widespread freshwater shrimp *Gammarus tigrinus* also lives in those dock rain-pools; but how did it reach there from the Bootle canal, some distance?

Sex

Because the word sex appeared in the Ministry of Agr. and Fish advanced press notice on trout-farming research, it got a wide write-up. Because the trout food-market prefers female fish, which taste and look better, the Ministry's Lowestoft Lab. has bred trout from eggs fertilised by males which began life as females, and had their sex changed by hormone-treatment. As only genetically male trout can give rise to male offspring this assured breeding females. Female fish can also be turned to male for breeding purposes.

A very readable and popular new book on the seashore, *Beside the Sea* by Tony and Hilary Soper (BBC Publications £4.25 for 168 pages, well illustrated) gives a very wide coverage, drawing mainly from their experience in southern estuaries like the Tamar. But the 4-sided wartime invading New Zealand barnacle, *Elminius modestus*, which the book doesn't mention is now our typical season barnacle, even on the Mersey, and not the formerly common acorn-barnacle they quote. I am surprised also that it states flounders are the only flat-fish to be found in estuaries. They may be the only flats to breed there, but the dab is almost as common in the Mersey and most other sandy-muddy estuaries, though it doesn't ascend above tidal limits like the flounder. Grey seals just as well as common seals rest at low tide on sandy banks in estuaries with no

rocky ledges. Rather than their shoulder-bag or plastic sandwich box for collecting specimens, I would suggest a modern plastic bucket, so light and more of a portable aquarium. Prof. John M. Sieburth's 492-page new book on *Sea Microbes* is a pioneer work, covering from diatoms to dinoflagellates, marine fungi and planktobacteria, with several identification keys—at £27.50.

Conservation

An unusual form of conservation to save Lake Sevan, which is drying up in the Armenian mountains of Russia, is to provoke artificial rain by methods ranging from silver iodide to huge hot air "canons" stated my copy of the Council of Europe's translation from *Actualites Sovietiques* No. 131.

1979 was another good breeding season for natterjack toads on their last major British colony on Freshfield-Ainsdale dunes, near Southport. I saw recently-excavated pools marked with black, football-sized congregations of their tadpoles in the shallows near their banks on evenings early in June, as if the tadpoles closed their ranks to conserve loss of temperature as the cool night approached.

Garden-ponds choked with summer growth may need their Potamogetons thinning out, and delicate fish and half-hardy water-plants brought into the greenhouse for winter: Nelumbos or lotuses, bog-arums, sub-tropical water-lilies like Blue Beauty, hybrid *zanzibarensis*, *Vallisneria* in the north, etc. Trimmed of dead leaves, half-hardy water-lilies will winter in a bucket or small tank with a few inches of water over their tops. A store of earthworms from the compost-heap can be kept cool in a tin of moist soil, or bran, with a glass or polythene cover, for use to fatten-up carp, cornets and over-wintering southern shubunkins, as these eat little in winter. Dense water-plants can be left to help any fry overwinter.

Water-starwort flowers in September. Tied to a 7 or 8ft. stake, a young weeping willow planted now by the small garden's pool will weep from that height, little more than a sprawling umbrella. Our childhood affection for buttercups lingers with rancunculuses, with the best to stand upright, bright eyed and bold, among summer's reeds: great spearwort. The next few weeks are suitable for planting this, and marsh-marigold. Our rarest native marsh-buttercups are the creeping spearwort, *reptans*, trodden-out by trippers from Ullswater but still by Aberdeenshire's Loch of Strathberg, and adder's tongue spearwort, *ophioglossifolius*, protected in two muddy Gloucestershire pools in a marshy meadow at Badgeworth towards Up Hatherley, near Cheltenham and near Hawkesbury.

Rushes

It is opportune to divide and replant in plenty of

September, 1979

silt the fat green true bulrush *Scirpus* (*Schoenoplectus*) *lacustris*, with chocolate inflorescence. Two handsome varieties are Japanese *zebrinus* banded in green and white, and *albescens* with creamy white young leaves. Better than introducing quickly-spreading native reed-mace, falsely called "bulrush," is to plant the foot-tall *Typha minima* in small pools or tubs, and taller, gracefully narrow-leaved *stenophylla*. Common soft rush with brown stem-tufts of flowers isn't very inspiring in the garden. Try its spiral-steemed Japanese corkscrew variety *spiralis*. Little 1-9 ins. native toad-rush, *bufonius* has brown flower-stars with green centres, and the large jointed rush *articulatus* has loose bunches. Also worth a place are perennial wood-rushes (*Luzula*), especially 6 ins., hairy spring wood-rush *pilosa* with panicles of little golden brown flowers.

Sundews

Perennial, insectivorous sundews glisten with read leaves around peaty pools and act like living fly-papers. Tiny white flowers are borne in May. They thrive best in a sphagnum-bog, like native purple-blue butterwort, *Pinguicula*, especially the lovely large *grandiflora* which I saw draping the famous moss-grown "weeping wall" at Lisdoonvanna in western Ireland. Lifted with its attendant moss, and kept wet in a saucer, it will form new leaves and flowers. Long-leaved sundew prefers black, peaty mud with less water than common round-leaved, only damp, not sodden. Ripe seed-capsules are gathered early in September for propagating. Its spring flowers rarely open and are self-pollinated. A pretty North American sundew with purple flowers, $\frac{1}{2}$ ins. across and nearly 10 ins. tall, with long, wiry green leaves, is *Drosera filiformis*. *D. peltata gracile* is a pink variety of a normally white flower.

Many Australian and South African sundews are potted-up in peaty soil and half-plunged in water. In winter, they die down to a resting bud. They are also propagated by divisions of the crowns, and detached leaves sometimes root vegetatively at the growing point. Several may be grown in a soup-plate of moss and water, feeding their sticky leaves with tiny bits of beef at intervals from July to September, when they grow brighter leaves.

Venus's Fly-Trap, an insect-plant for the summer bog, is *Dionaea muscipula* from Florida. It resembles a large green sundew with gaping leaves, folding like clam-shells armed with ugly-looking teeth around their edges. It must have ample sunshine, producing a tall, trivial flower. Alongside can be grown papery-green, well-veined funnels of the pitcher-plant, another insect-trap named *Darlingtonia californica*. These will not winter outdoors, though in the mild southwest the latter may be covered with cloches.



Michael Fish presenting Aquarist & Pondkeeper Trophy to Michael Fox of Wycombe Marsh A.S. Society for Best Fish in Show.

AS SOON AS you entered the Palm Court of Alexandra Palace, there was no doubt as to what awaited you; immediately before you was the whole aquatic hobby encapsulated in three displays. A trio of furnished tropical freshwater aquaria were flanked on one side by tropical marine aquaria, and by a Koi pool on the

THE AQUARIST FISHKEEPING EXHIBITION

by R. Mills

other. Just to emphasise this complete coverage, the herpetologist was also made to feel at home by the welcoming sight of a large reptile and amphibian display. All this was before the main body of the hall was reached!

Trade stands were situated mainly around the perimeter of the Palm Court, enclosing the competitive fish Classes, Furnished Aquaria, Aquascapes and Society Tableaux. The organisers of the competitive aspect of the Exhibition had wisely sited the Tableaux

John Young presenting Trophy for Best Tableau to a representative of Basingstoke A.S.



away from the fish Classes, which meant that the visitor who wanted to study the fishes would not be constantly jostled by youngsters wanting to see the models on the Tableaux.

Each row of exhibits was 'head and tailed' by a Furnished Aquarium or Aquascape, which did much to break up the rows of tanks. Each Class was headed by a notice outlining the types of entries likely to be encountered within the Class and, except for 'one-species' Classes every exhibit was labelled with the correct scientific name of the fish, plant or reptile.

The range of fish sizes on view was extremely wide, from the diminutive Mosquito Fish (*Heterandria formosa*) to the giant Fire Eel (*Mastacembelus erythrotaenia*). A couple of colourful characters in the Cichlid Class were neighbouring *Cichlasoma citrinellum* and a *Cichlasoma festae*, the latter 'switching on' its body colours every time it caught sight of its humpheaded neighbour through the end glass of its tank.

The livebearing fishes were a special attraction, particularly the 'Any Other Species' and here again the labelling of each entry was much appreciated by visitors who were heard to mutter, "so that's what they are."

As is becoming the pattern at Open Shows, the Characin and Corydoras Classes were the most highly supported, a fact which was reflected in the large numbers of Corydoras catfishes for sale on the Trade Stands on one hand, and also that the **BEST IN SHOW** came from the Characin Class, a magnificent Three-striped Pencilfish (*Nannostomus trifasciatus*) owned by Mike Fox of Wycombe Marsh A.S.

African anabantid fishes were well represented, with several *Ctenopoma* species on show and it was not surprising that a *Ctenopoma kingsleyae* won the Class; these fishes seem to revel in Shows and deport splendidly.

Ten exhibits of *Pterophyllum* species fought for the 'ANGEL OF ANGELS' title and despite the presence of such cultivated varieties as the Marbled, Zebra, Lace and Veiltails, it was very reassuring to see the established favourite, the Silver Angel emerge as the winner for its owner, Terry Woolley.

BEST COLDWATER FISH went to Paul Mills (Runnymede AS) for his *Common Goldfish*, but a *Lionhead* owned by fellow Club mate R. Tydeman must have run him close. Native coldwater fishes included *Sticklebacks*, a *Golden Orfe* and a rod-

THE AQUARIST

The Mayor and Mayoress of Haringey admiring the Basingstoke A.S. which won 1st award in the Tableaux section on the left of the photograph Mr. W. W. Charman (Managing Director of Buckley Press) talking to Mr. Cyril Brown and on the extreme right Mr. Bob Esson (Chairman of FBAS).

worthy *Chub* but a *Bitterling* beat them all into first place for its owner, Peter Moye of Sudbury A.S.

Top award in the Society Tableaux went to Basingstoke A.S. who recreated their Mississippi Riverboat theme, but it was 4th place Sudbury A.S. who took the award for Best Model for their Wayermill; Portsmouth A.S. scooped three awards—2nd place overall together with awards for Best Aquatic Content and Most Informative—with their World of Animals display, in which a button adjacent to each exhibit on their stand lit an appropriate indicator on the genealogical tree. Hendon A.S. forsook their usual highly technical display themes this year and went for entertainment (and perhaps temperance) with an 'Alcohol to Alkaline' theme which illustrated the progression from home-made wine to fishkeeping—well, you can use heaters and thermostats for both! This Tableaux also took Most Entertaining award. The difficult task of selecting the winners from amongst some clever opposition from Runnymede A.S., Hounslow A.S., East Kent A.S.G., and the Southern Livebearers Aquatic Group fell to Malcolm Hardy (of Aquatic Nurseries), John Ransome (John Allan) and Derek Shankland (Peterama), an unenviable duty but the verdict was thoroughly approved by all.

First prize award (A. U. Kol).



In addition to the competitive Classes and Trade displays, *The Aquarist Fishkeeping Exhibition* was also the meeting place from all parts of the globe; it seemed at one stage that each successive visitor had come from further afield than the last.

There was a contingent from Tyne-Tees, coach parties from the West of England; two members of Bristol T.F.C. arrived at the Exhibition on the Tuesday to help and remained for the rest of the week; Gordon Smith came over from Dublin, and there were many friends from aquatic Societies in the north of England who came to say 'hallo.' Larry Schultz, of Instant Oceans, interrupted a flight back from Europe to the U.S.A. to take in the Exhibition, and two of the FBAS Vice-Presidents, Alec Frazer-Brunner and Ken Pye, were welcome visitors.



Top Two young visitors obviously fascinated by the huge specimens of Koi provided by the BKKS.

Middle and Bottom Some of the 8,000 people who attended The Aquarist Fish-keeping Exhibition examining competitive entries during this popular three day event.



Visitors to the Show included Mr. W. W. Charman, Managing Director and Chairman of Buckley Press, who are publishers of *The Aquarist*, and have been associated with the journal since the days of its founder, the late Mr. A. E. Hodge. The Mayor and Mayoress of Haringey, were conducted around the exhibits by FBAS Chairman Bob Esson.

Prizegiving is always the high spot of any competitive event, and an added attraction was the presence of Michael Fish, BBC tv's Weatherman, who presented the Trophies to the fortunate winners, and there was some speculation that he might have had something to do with the three days of glorious sunshine which blessed the Exhibition.

Impressions of the Exhibition were mixed; there was plenty to see and amongst the more uncommon fish were a *Garra taeniata*, *Limnurgus innominatus*, and *Jenynsia lineata*; the winning Dwarf Cichlid, a *Teleogramma brichardi* was often mistaken for dead due to its unusual fin colouration giving the impression that it was upside down on the bottom of its tank! Although the Reptile & Amphibian Class was not as well as supported as had been hoped, it did provide a clean sweep for the ladies from Strood, Runcymede and S. E. London Societies.

Unfortunately some Societies could not be there with their Tableaux, but it is expected that while this may have been due to rising production and transport costs, they may be encouraged to join in next time.

The specialist Societies exhibiting included the *British Marine Aquarist Association*, *The British Koi-Keepers Society* and the *Southern Livebearer Aquatic Group*, who all reported brisk interest in their respective aspects of the hobby and several new memberships were made.

A feature of the Exhibition was the display of Piranhas, two fair-sized specimens were on view accompanying a tank containing 100 youngsters which attracted many blood-thirsty youngsters to their tanks. An equally attractive display was provided by the Frome Reptile Centre, containing snakes, Monitor Lizards, Tree Frogs, Tortoises and practically anything else you can think of that slithers and crawls! It is rumoured that the exotic snakes guarded the Trophies overnight—none of the valiant Night Stewards would confirm or deny this, being too timid to find out, no doubt!

All the ingredients were there for a successful return to Alexandra Palace, good weather, good company, Trade Stands bursting with new products, fishes and plants (both aquatic and terrestrial alike) galore, and plenty of space to move around. The organisers, *The Aquarist & Pondkeeper* magazine together with the Federation of British Aquatic Societies, are to be congratulated in achieving an excellent mixture to suit everyone in the hobby with the prospects for future events of this nature now set fair.



THE AQUARIST FISHKEEPING EXHIBITION SHOW RESULTS



RESULTS OF *The Aquarist & Pondkeeper* show held at Alexander Palace 1979 are as follows: All exhibits were judged by the following F.B.A.S. judges: R. Bowes, J. Carney, L. Collins, P. Cottle, D. Durrant, J. Jeffery, D. Jones, R. King, K. Saxby, J. Stillwell. Tableaux were kindly judged by traders.

Best Fish in Show was won by M. Fox, of Wycombe Marsh A.S. and Highest Pointed Society was won by Sudbury A.S. Angel of Angels won by T. Wooley (SLAG).

Class Aa: Society Furnished Tropical: 1, Runnymede; 2, Walthamstow; 3, Portsmouth; 4, Stevenage. Class Ab: Society Furnished Coldwater: 1, Portsmouth; 2, Walthamstow. Class Ad: Individual Furnished Tropical: 1, R. Matson (Runnymede). Class Ae: Individual Furnished Coldwater: 1, T. Wooley (SLAG); 2, W. Turner (Letchworth). Class Ag: Mini Furnished Aquaria: 1, P. Martin (Basingstoke); 2, J. Martin (Basingstoke); 3 and 4, S. Fursedon (Walthamstow). Class Ah: Society Aquascape: 1, Runnymede; 2, Portsmouth; 3, Runnymede; 4, Walthamstow. Class Ak: Individual Aquascape: 1, Mrs. Tydeman (Runnymede); 2, T. Butler (Runnymede); 3, P. Cairn (Runnymede). Class B: 1 and 2, M. Bourne (SELAS); 3, B. Witterage (Sudbury); 4, Y. Longuet (London). Class C: 1, M. Fox (Wycombe Marsh); 2, M. Bourne (SELAS); 3, T. Gibson (Sudbury); 4, P. Moye (Sudbury). Class Ca: 1, W. Hastings (SELAS); 2, J. Payne (SELAS); 3, David Winder (E. Dulwich); 4, P. Mills (Walthamstow). Class D: 1, J. V. Payne (SELAS); 2, T. Wooley (SLAG); 3, W. Hastings (SELAS); 4, Mr. Furze (Letchworth). Class Da: 1 and 4, T. Wooley (SLAG); 2, J. London (Southend); 3, Mrs. Chapman (ELADA). Class Db: 1, 2 and 3, M. Bourne (SELAS); 4, J. Jackson (Basingstoke). Class Dc: 1, C. Enright (Southshields); 2, J. V. Payne (SELAS); 3, M. Bourne (SELAS); 4, B. Witterage (Sudbury). Class E: 1 and 2, P. A. Moye (Sudbury); 3, T. and P. Taylor (Sudbury); 4, M. Bourne (SELAS). Class Ea: 1, C. Richards (Sudbury); 2, A. P. Taylor (Sudbury); 3 and 4, Doris Winder (E. Dulwich). Class F: 1 and 4, B. Witterage (Sudbury); 2, J. Jackson (Basingstoke); 3, R. Walshe (Sudbury). Class G: 1, T. Wooley (SLAG); 2, J. London (Southend); 3, C. Richards (Sudbury); 4, P. Moye (Sudbury). Class H: 1, P. Coyle (Walthamstow); 2, W. Hastings (SELAS); 3, B. Witterage (Sudbury); 4, P. Moye (Sudbury). Class J: 1, Doris Winder

(E. Dulwich); 2, David Winder (E. Dulwich); 3 and 4, W. Hastings (SELAS). Class K: 1, R. Walshe (Sudbury); 2, J. Jackson (Basingstoke); 3, C. Richards (Sudbury); 4, W. Hastings (SELAS). Class L: 1, C. Richards (Sudbury); 2, P. Coyle (Walthamstow); 3, W. G. Vicary (Deal); 4, David Winder (E. Dulwich). Class M: 1, J. London (Southend); 2, P. Moye (Sudbury); 3, B. Witterage (Sudbury); 4, M. Bourne (SELAS). Class Nbm: 1, W. Hastings (SELAS); 2, J. V. Payne (SELAS); 3, M. Bourne (SELAS); 4, C. Chesswright (Southend). Class Not: 1 and 2, D. Chesswright (Southend); 3, M. Strange (Basingstoke); 4, W. Hastings (SELAS). Class O: 1, C. Richards (Sudbury); 2, W. Hastings (SELAS); 3 and 4, R. Walshe (Sudbury). Class P: 1, F. Chapman (ELAPA); 2, R. Matson (Runnymede); 3, A. Chapman (ELAPA); 4, H. P. Taylor (Sudbury). Class Q: 1 and 3, W. Hastings (SELAS). 2, R. C. Andrews (Strood); 4, B. Dogget. Class Rb: W. Hastings (SELAS); 2 and 4, T. Wooley (SLAG); 3, R. and C. Andrews (Strood). Class S: 1, M. Bourne (SELAS); 2, F. Chapman (ELAPA); 3, I and P. Taylor (Sudbury); 4, M. Waller (SLAG). Class T: 1, M. Strange (Basingstoke); 2, P. Moye (Sudbury); 3 and 4, C. Richards (Sudbury). Class Ua-b: 1, 2 and 3, P. Mills (Walthamstow); 4, Sylvia Brown (ELAPA). Class Uc-d: 1, J. W. F. Hughes (Roehampton); 2, Sylvia Brown (ELAPA); 3, M. Bourne (SELAS). Class Vg-1: 1, R. Tydeman (Runnymede). Class W: 1, P. Moye (Sudbury); 2, J. London (Southend); 3 and 4, J. W. F. Hughes (Roehampton). Class Wa: 1 and 2, W. Turner (Letchworth). Class Xbm: 1, M. Strange (Basingstoke); 2, J. V. Payne (SELAS); 3 and 4, C. Chesswright (Southend). Class Xo-s: 1, T. Gibson (Sudbury); 2, R. C. Andrews (Strood); 3 and 4, A. P. Taylor (Sudbury). Class Xe: 1, T. Wooley (SLAG); 2, A. P. Taylor (Sudbury); 3, D. Chesswright (Southend); 4, R. Martin (Basingstoke). Class Za: 1, T. Gibson (Sudbury); 2, J. Jackson (Basingstoke); 3, C. Chesswright (Southend); 4, P. Mills (Walthamstow). Class Zb: 1, M. Waller (SLAG); 2 and 3, P. Mills (Walthamstow); 4, J. Hughes (Roehampton). Class Zc: 1, J. Hughes (Roehampton); 2 and 3, P. Mills (Walthamstow); 4, J. Jackson (Basingstoke). Amphibia: 1 and 4, C. A. Butler (Runnymede); 2, Mrs. Bourne (SELAS); 3, Mrs. P. A. Andrews (Strood). Tableaux: 1, Basingstoke; 2, Portsmouth; 3, London; 4, Sudbury.

A total of 18 societies took part in the competition.

Coldwater jottings

by Frank W. Orme

HOW QUICKLY the days pass; it seems such a short time ago that we were all anxiously wondering how long last winters grip would last—it seemed that spring and summer would never arrive. But, come they did and the fish spawned despite many enthusiasts fearing the worst. It may have been my imagination, but there seemed many more frog tadpoles this year, and the pond plants appeared to grow more prolifically, as though Nature were trying to compensate for the harsh conditions which the winter had imposed. Nevertheless, some people did not feel that Nature had treated them kindly; both koi and goldfish were reported to have succumbed to the prolonged low temperatures. A little later in the season and conflicting spawning results began to be made, either the fish spawned vigorously with a high hatching yield from the eggs or else the males seemed reluctant to chase and the females threw very inferior eggs—the fertility, in many cases, was said to be poor. With such mixed reports I feel it would be foolhardy to attempt to draw any conclusions.

Koi Chase

It was during this period that I received a telephone call from a koi enthusiast. The caller was worried because the male koi, in the large pond, had been chasing the female from early morning and, although it was late afternoon, were still pursuing her. The rotund appearance of the female's body had been reduced to a slimmer streamlined shape, and there were some fears for her well-being. I gave an assurance that I felt it was almost certain that life in the pond would have returned to its normal peaceful state by morning, and doubted that the female would have suffered any real harm. This was not a planned spawning, nor had the hobbyist any interest in spawning the fish. However, the young son asked that some of the eggs should be gathered and an attempt made to hatch them. Shortly after the telephone conversation I paid a brief visit to the home of this enthusiast where I was shown a number of koi fry; these were housed in a large tank and, I was pleased to note, were growing well. I shall most certainly be interested to see how these fish develop and intrigued to see their colours—especially as the young are the product of mixed colour types. Whatever the end result there is little doubt that many will find a permanent home in the pond with their parents—for there is an undoubted pleasure in being able to

point to a fish and say "I raised that fish myself from a spawning."

It is often interesting to talk with people who are in other livestock hobbies—especially about their methods of raising quality stock. Not so long ago I had such a conversation with a man who is well known, in his own particular sphere, as a first-class judge and breeder of poultry. He raises exhibition quality Barred Rocks and Silkie bantams, and has shown his birds with great success for many years, in fact, he gained a number of top awards in this years Royal Agricultural Show.

Quality Stock

Having specialized in his chosen varieties of bantams for sixty-odd years, he held very firm beliefs on the subject of producing quality stock and was convinced that it was essential to concentrate on creating pure-blood pedigree lines—avoiding at all cost the introduction, by outcrossing, of any unrelated stock. "Too often," he said "a good looking bird is seen, which may be excellent in its own right and, in an effort to take a short-cut, the bird is purchased. However, if it is not blood-related to the buyer's own stock, the chances of producing any improvement are not very great—in fact, it is more than likely to produce inferior young thus undoing any work that has been put into the strain, rather than bringing about any quick-term improvement." In his opinion the only certain way of producing quality stock was to concentrate upon selective breeding of the existing stock, being prepared to devote a number of years to achieving the aim; "patience and endurance will finally bring the results," he stated.

The method which he had practised continuously over the years entailed a system of back-crossing, young females being bred with either their father or grandfather. Young males were never crossed with an older female because, he believed, this tended to produce weaker young than did his preferred crossings. When I enquired why this should be, I was informed that in his opinion the males tended to be stronger and passed their strength and vigour on, whereas the older females were somewhat weaker and appeared to lack the ability to produce offspring that were as sturdy as those from a young female and older male. He had found, in his case, that if an old female were mated with a young male the progeny tended to be much smaller and seemed to show less quality. He

firmly rejected any suggestion that a female might carry the greater potential to pass on inherited genetic characteristics. Sharply I was informed that he had heard 'that Old-wives tale' on countless occasions, and it was totally without logic, "A true brother and sister must both share the same inherited make-up, therefore it should be perfectly obvious that both will carry the same potential to pass those inherited factors to their young—be they good or bad."

Sibling Crosses

Did he ever make use of a sibling cross I asked, and was told that he never crossed a brother with a sister—although he had done so in the past—because he had found that, whilst it strengthened the characteristics, it also weakened the stock and could result in under-sized adults, but he knew some poultry breeders who regularly made sibling crosses and seemed to suffer no ill-effects in the young; however, he would definitely not practice it himself.

In the light of his many years' experience of breeding show birds he said he always gave the following advice to anybody who intended taking up the breeding side of the hobby: first obtain stock from a recognised breeder of proven stock, and always make sure that the stock is healthy—ask to see those which are not for sale, because this can give an indication of quality, before finally deciding to purchase. Buy a trio of two males and one female, making sure that they are not too old for breeding purposes—which may be why they are being sold. From this beginning it is possible to create two related lines; however, it is not necessary to obtain exhibition quality breeders, provided they have been produced from a first class line. By running two related lines the need to bring in outside stock should not arise for, if need be, it is always possible to outcross one line with the other in the knowledge that they are closely related through the blood of the original male. If circumstances arise which force the introduction of outside stock always try to ensure that it is blood-related—if possible go back to the original breeder. If this precaution is not taken the line will be put at risk, and a marked deterioration may be seen in either the first or second generation of young.

"Time, perseverance, patience and careful selective breeding," he stated, "would bring their own reward, but only if all temptation to take short-cuts is resisted—for this will only delay the final aim, despite any apparent short-term improvement."

On the face of it that conversation did not appear to have any bearing upon the breeding of fish but, if it is studied a little closer, much of what was said could be applied to our hobby—indeed there could be some useful tips that are well worth considering and, perhaps, applying.

On Sunday the 15th of July I visited the Aquarist

Fishkeeping Exhibition at Alexander Palace, London. This event had certainly attracted the public, as the milling throngs of people proved. Set in a large hall, the show was well set out with dealers' stands, from as far away as Bromsgrove, in Worcestershire, set around the outer walls. These appeared to be attracting a good deal of attention and, one imagines, finding their attendance well repaid. The society tableaux were situated at one end of the hall, some being very well executed and drawing many interested viewers. Apart from the official stands, such as those of the Aquarist & Pondkeeper Magazine and the Federation of British Aquatic Societies, the rest of the hall was devoted to the ranks of the competitive classes. Tropical fish there were in abundance but, to my great disappointment, the coldwater classes were very poorly supported indeed. In fact, a number of visitors, both during and since the exhibition, have voiced their dismay over the small number of coldwater fish that were on display—as one man said, 'there were more fancy goldfish to be seen on the traders' stands.' Why is it, I wonder, that the coldwater fishkeeper seems so reluctant to support these national exhibitions? A number of reasons have been suggested to me, the most common being 1) a good show quality fancy goldfish is far too valuable to risk in a show lasting more than one day, and would be irreplaceable if it were lost, therefore the country's top exhibitors are not prepared to take the risk. (2) The schedules allow a wide variety of classes for the tropical fish enthusiast—so that like can be judged against like—but only very restricted classes are allocated to the coldwater fishes, whereas the exhibitor would prefer to be given a one class for each variety of fancy goldfish schedule plus a larger division for any other sort of coldwater fish. One well known exhibitor informed me that he had no intention of carrying show tanks for miles just to enter his fish in a mixed class and, on top of that, be expected to leave them for three days—which would entail another long distance journey to collect the fish and tanks. Even if these reasons are well founded, and no doubt they are, I still anticipated greater support from enthusiasts who did not have to travel any great distance.

Anonymous Fish

A more general complaint was the fact that only a few tanks carried labels to identify the fish which it contained. However, despite these complaints I feel that Mister and Mistress Public, and their children, found the exhibition both enjoyable and interesting—and, if the number of plastic-bagged fish that I saw being carried away was anything to judge by, I am sure that quite a number of new hobbyists have joined our ranks. Perhaps next year the coldwater fraternity will take the opportunity to exhibit more of their fish to the public gaze.



Killifish

by Bob Purdy

Part 3

New World Killifish

NEW WORLD KILLIS can be some of the most rewarding and unusual species of fish to keep and breed. Killifish inhabit most parts of North and South America as well as the offshore Caribbean islands such as Jamaica, Cuba and Hispaniola. In order to deal satisfactorily with this rather diverse group of fishes, it will be necessary to divide them up into the following sections:

1. North and Central American non-annual killis;
2. South American non-annual killis; and
3. Annual killifish.



Rivulus toddi (male) an African annual species

Group 1 North and Central American non-annual Killis

The main genera contained within this group are the Pupfishes, *Cyprinodon* spp. and the Top Minnows, the *Fundulus* spp. Both of these genera are well represented in the mainland U.S.A. and some *Fundulus* species are also found in Central America and on the island of Bermuda.

Generally speaking, both genera prefer solitude, are too aggressive once again for the community tank and both genera are more at home if kept in fairly brackish water. Water temperatures should be kept right down to about 20°F and even 15°F is tolerated with no apparent difficulties. It must be remembered that there are certain species of Pupfish that do not conform to this general picture but any aquarist lucky enough to get hold of such species as these would be in a position to know what special requirements are needed. One such example that springs to mind is that of one of the Desert Pupfishes, *Cyprinodon nevadensis*, a rare species with five different subspecies that all inhabit distinctive environments such as different desert water holes.

Pupfish in general are easy to feed and even easier to breed but they do seem to be particular about water conditions such as salt concentrations and temperature.

Cynolebias whitei albino strain

THE AQUARIST

Once these factors are correct for the species concerned, breeding will follow almost automatically. Spawning, once begun, can continue for a number of days and even up to a week or more but a wary eye should be kept on the females and they should be removed at the first sign of exhaustion. The pair or trio should be removed at the end of a week and allowed to rest separately as the fry will start to hatch around eight days after spawning commenced. Pupfish will make use of spawning mops but a few plants such as *Cabomba* and *Elodea densa* can prove to be much more effective both for the spawning fish and the resulting fry. A minimum of ten gallons is required to spawn a single trio and only one male to a tank is once again the rule to follow.

Fundulus species are also bred and kept in the same way as *Cyprinodon* species. Some representatives of this genus might require higher rock salt concentrations than those used with Pupfishes but this depends, of course, on what species is involved. Some *Fundulus* species are top-spawners, some are bottom-spawners, some are mid-spawners and some aren't at all fussy and will spawn at any level. If spawning mops are to be used with members of this genus, it would be a good idea to have mops that reach the base of the aquarium. *Fundulus* species are very well known spawn robbers and should be separated from their eggs as soon as possible. It is perfectly feasible to pick the eggs from the mop once a day, they are as easily handled as any other killifish eggs, and immerse them in water from the tank and store them in a small container.

Possibly the best known killifish of all is included in this group and belongs to the monospecific genus, *Jordanella*. This species is, of course, the American Flagfish (*Jordanella floridae*) and it is found in the southern state of Florida. A slightly higher breeding temperature, approximately 75°F, is required for this species. Eggs are laid in "cichlid" fashion on the available substrate and the male fish stands on guard, fanning the eggs to give them a continuous supply of fresh, oxygenated water. Once spawning is completed, often between one and four days, it is wise to remove the female and leave the male in sole charge of the eggs.

Group 2 South American non annual Killifish

All the more common South American non annual killifish belong to the large genus, *Rivulus*. Some species of *Rivulus* can be found as far north as Florida and a few species are found in Central America and on the offshore Caribbean islands of Cuba and Jamaica. Most of the numerous species of *Rivulus* are found in north and central South America and as such, the whole genus should be considered of South American origin.

Most aquarists are of the opinion that this group of fishes occupy the South American equivalent of the African environment occupied by the genus *Aphyosemion* but this, however, is not so. By far the largest

percentage of *Rivulus* species come from fairly fast flowing waters and species belonging to this genus are rarely found in still water or swampy pools. Trying to link various fish groups in this way can be a very unrewarding pastime as no two environments are identical. As it happens the fresh standing waters of the north coast of South America are more often inhabited by live-bearing species that are taxonomically more distantly related to *Aphyosemion* species than ever *Rivulus* species are.

Some *Rivulus* species can be considered as possible inmates for the community tank as they are less aggressive than most of their relations and do not grow to large sizes in captivity. They are, however, the gold medalists in the piscine high jump competition and a good, tight-fitting lid is absolutely essential for whatever aquarium becomes their home. It has been known for a *Rivulus* male to accurately jump through a gap only one quarter of an inch wide so take heed and keep the tank covered at all times. It is said that *Rivulus* species leap out of water in the wild in order to rest for a time on the vegetation at the sides of the stream. One theory is that they are "sunning" themselves but this seems unlikely as the fishes would dry up quite rapidly.

Rivulus species are not too particular about water conditions and will happily tolerate either soft or hard water providing extremes of both are avoided and any changes, from one to the other, is done in stages and not all at once. A well planted tank or a number of long spawning mops will provide ideal hiding places for both eggs and resting females. Water temperatures should be in the order of 75°F to 80°F for breeding purposes even though most species belonging to this genus will tolerate water temperatures as low as 60°F for short periods of time.

Breeding *Rivulus* species is normally a straightforward procedure and some members of this genus will even spawn in a community tank providing certain conditions are right. Males of this genus are continual drivers and spawning can take from four to eight weeks or even longer depending on the condition of the mated fish. The usual methods can be adopted for hatching the eggs as they are quite large and strong and can be picked from the mops in the usual way. They can be stored in small containers in water of the same temperature and conditions as that of the tank. It is also possible to remove the spawning pair after ten days or so and allow the eggs to hatch naturally or even leave the adults with the eggs and let nature take her course. If the latter strategy is adopted, of course, a much smaller yield of fry is only to be expected because, whilst *Rivulus* species do not actively hunt their own eggs or fry, they do not turn down chance offerings that they might come across.

Group 3 Annual Killifish

This is the group of fishes that are the most interesting of all the groups of killifish. Included in this group are the genera, *Austrofundulus*, *Cynolebias*, *Cynopocilus*,

Pterolebias and *Rachovia*, all of these being found in South America. It is also worth remembering that the African annual killifish, such as all the *Northobranchius* species, *Aphyosemion sjoestedti*, *Aphyosemion gulare*, *Roloffia occidentalis* and *Roloffia toddi* can also be treated in exactly the same way as the much more numerous South American species.

The various species of annual killifish are unique in that they inhabit temporary waters that dry up every year. This means that the fishes have to adopt some sort of biological strategy to enable either them or their offspring to survive until the pools refill again at the start of the next rainy season. Some groups, such as the Lungfishes (*Lepidosiren* and *Protopterus*), have made use of a kind of hibernation technique to overcome this problem and remain buried in the base of the pool throughout the dry season. Yet other groups, such as the large tropical catfishes (*Misgurnus* and *Clarias* species), often "walk" away and search out a more permanent stretch of water at the onset of the dry season.

Annual killifish have adopted a more straightforward method for survival. It requires the eggs to be buried in the mud on the base of the pool and left during the dry season to hatch out when the pool refills at the start of the rainy season. Since adopting such a strategy, the eggs of annual species of killifish have become somewhat specialised and do not develop in the way that normal killifish eggs do. Suffice it to say that in the first instance, the outer skins of the eggs are even tougher than normal and secondly, the development of the fry is either slowed down considerably or even halted altogether. Normal fry metabolism is regained under the influence of certain external stimuli such as high carbon dioxide concentrations and low osmotic pressures.

Because of their unique breeding methods, species from this group have to be reproduced in the aquarium in a special way. It is usual to purchase or acquire eggs rather than fishes and, in view of the very short lifespan of the species, the purchase of adult fish should be avoided unless their source and age is known.

Eggs are normally purchased in moist peat and a hatching date is usually provided. Eggs should be stored at about 65°F to 70°F and on the hatching date the eggs and the peat should be placed into a small container of aged water and a lookout kept for the small fry that should soon be seen darting about on top of the settled peat. Fry should be fed in the normal way and after about a week the peat should be removed, dried to the consistency of moist pipe tobacco and stored for two to four weeks in a polythene bag at the temperature given above. The dried peat should then be re-wetted, just as before, and very often a second hatching will result. The second hatching can sometimes exceed the numbers in the first hatching but more often, it is around 10-15% of the first hatch.

Why do some eggs refuse to hatch the first time

around and then hatch on the second wetting? The exact mechanism that enables the eggs to perform this remarkable feat is, as yet, undiscovered but its value to the species is more than obvious. If all the eggs hatched out after the first wetting and the pool then dried out again, as sometimes happens when the rains at the start of the season are intermittent, then all the newly hatched fry would die. Because of the "resting egg" mechanism, when this does occur it does not spell disaster as there remains a number of unhatched eggs ready to hatch when the pool refills.

Once the fry are hatched, they must be well fed in order to take full advantage of their growth capabilities. Annual killifish must be amongst the fastest growing species of fishes in the world, with some species reaching sexual maturity in six to eight weeks from birth and growing to full adult size in three months. It is obviously a distinct advantage, in the wild, to reach maturity as quickly as possible and to spend as long as possible spawning and laying eggs before the pools dry up.

Because of the limited amount of time available to them, annual killifish are very ready to spawn and a well fed trio (do not try pairs unless there is no alternative) will spawn continuously for all their adult life. Males can be very hard on females so a lookout should be kept for torn fins or other superficial damage. The best spawning medium to use is plain, ordinary peat or sphagnum peat moss but care should be taken to ensure that it contains no additives such as phosphates or nitrates. Silver sand is also used as a spawning media but the eggs have to be removed by differential sieving and this method is more likely to be used by breeders who want to sell eggs by numbers.

Another name for this group of killifishes is the Peat Divers and this very aptly describes the spawning procedures adopted to deposit fertilized eggs under the base of the pool. The male and female approach each other and then, side by side, they dive headlong into the bottom layer and often become completely buried for up to 30 seconds or more. The eggs, of course, are laid and fertilized whilst the pair is buried under the bottom layer and whether one or more eggs are laid on each spawning dive is anybody's guess. Once these fishes are in spawning condition, they will often spawn on the bare base of a tank but this method is not recommended as the acid conditions inside the peat keep down bacterial and fungal attack and eggs laid in bare tanks are not so protected.

Whatever spawning method is adopted, the eggs must be stored in peat that has been dried to a consistency of moist pipe tobacco and sealed in air-tight, polythene bags. It is important, at this stage, to date the bags using a permanent method to do so. In most cases the hatching times will be known but they vary from species to species so the following will only serve as a rough guide. *Northobranchius* species (African annuals) take about six to eight weeks in storage before

they are ready to hatch and species belonging to the genera, *Austrofundulus*, *Cynolebias*, *Cynopoeilus* and *Pterolebias* take from eight to twelve weeks. Some species can take up to six months, such as *Roloffia occidentalis*, but this figure can vary even within that species and storage factors such as temperature and oxygen concentration must obviously influence hatching times as well.

If a hatching time is not known, there are certain methods which can be employed to achieve a hatch from stored eggs. Firstly, if eggs are not "eyed up" there is very little chance that they will hatch out when wetted, consequently, it is usual to wait until the fry can be seen inside the egg before attempting to hatch them. Secondly, after about ten to twelve weeks have lapsed, even if the eggs do not appear to have eyed up, one or two eggs should be wetted to see if a hatch is possible. If the eggs do not hatch, they can be dried and rewetted on a week to week basis until a hatch is achieved. Once the test eggs hatch, the fry should be closely examined to determine their true condition. Fry with enlarged bellies, known by aquarists as belly sliders, are indicative of the fact that the eggs have been hatched out too soon. Fry with sunken bellies tell the opposite tale and all the outstanding eggs should be wetted straight away in the hope that not all the eggs will be overdue. Fry with normal bellies indicate that the hatching date is about due and the rest of the eggs should be hatched within seven days or so.

Marine Queries *continued from page 30*

filter, you may increase this stocking to 1 in. of fish to each 2 gallons of seawater.

You probably have some 4 in. of total fish length in your tank at present. The gross capacity of your "GEM" is about 25½ gallons. Making due allowance for displacement by the filter-bed and rocks, etc., you probably have around 20 gallons of actual seawater. I will assume that you haven't really aquired "fishy-fingers" yet, and therefore advise that you don't exceed 1 in. of fish to 4 gallons (= 5 in. of potential stocking capacity). Thus you just about have room for a very young Banana Wrasse. When working out stocking capacity we never include sessile invertebrates since the biological loading factor which they impose on the filtration system is very low.

(4) *Invertebrates and Seahorses.* For the reason given above you can keep as many sessile (i.e. non-moving) invertebrates as there is physical space on the rockwork to accommodate within reason. However, from the standpoint of both predation and biological loading I would not include any more of the very active invertebrates such as crustaceans or cephalopods (octopus, cuttlefish, etc.).

There is very little else to be said about annual killifish in such a general context as this. Without doubt, annual killifish present a difficult and time-consuming subject to culture and keep but the rewards can be quite breathtaking. Although South American annuals do not boast the gaudy colours of their *Ahyosemion* cousins, they do have magnificent finnage and bearing and a fully grown, Fringed Longfin, *Pterolebias longipinnis*, is a rare sight indeed.

This small series of articles only scratches the surface when it comes to the keeping and breeding of such a diverse group as the family of killifishes, Cyprinodontidae. If any part of these articles has roused an interest in certain species of killifish it is more than possible that attempted acquisition of these species will only end in frustration. Please do not blame your local pet shop for not stocking such species as they are rarely imported commercially and are not very profitable from a dealer's point of view. The British Killifish Association offers a viable alternative as a source of supply for many different killifish species and is also a source of much more detailed information about the whole family of fishes.

References

- Freshwater Fishes of the World* (1962) Gunther Sterba. Studio Vista, London.
Fish Physiology, Vol. VI (1971) Hoar and Randall. Academic Press Inc., New York.

I would also advise you against buying any seahorses. These slow-moving, slow-thinking creatures would not compete with your other fishes at feeding times and would slowly starve to death. The only coralfishes I can think of off hand which are suitable to live in community with seahorses are the pipe fishes and some of the dragonets. If you don't follow this advice you will inevitably find yourself forced into messy, unhygienic fish-feeding methods, i.e. you will have to deliberately add more Mysis shrimp than is prudent, in the forlorn hope that the seahorse might find a shrimp or two before the others eat the lot.

(5) *Anemones.* Clownfishes certainly live longer, are more colourful and disease-free if allowed to develop a normal symbiotic relationship with an anemone. N.B.—See lighting requirements under (2) above. You need either a *Stoicactis* or *Radianthus* spp., which under the necessary brilliant illumination will feed every 2-3 days on a piece of "SeaVita"—soaked squid/cockle/crab/prawn/shrimp, etc., about the size of a garden pea. In the interests of disease prevention always insist on gamma-ray irradiated seafoods for your aquarium.

**Feeding.* I have elaborated on the correct feeding of coralfishes in the "Aquarist & Pondkeeper"—Alexandra Palace Exhibition Catalogue, 1979.

DISEASE QUERIES

by Dr. Christopher Andrews

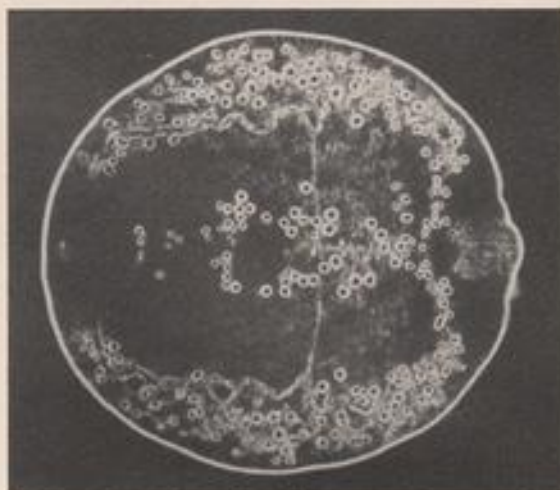
LETTERS should be addressed to Readers Service, The Aquarist and Pondkeeper, The Butts, Brentford, Middlesex TW8 8BN. Alternatively Dr. Andrews may be contacted at the Tetra Information Centre, 15 Newlay Lane Place, Leeds LS13 2BB.

Several of my goldfish in an indoor aquarium have recently suffered from body-fungus. Despite trying out a variety of brands of remedies, the problem always returns. Can you help?

To begin with it is important to realise that the tiny spores which give rise to the fungal infection are quite common in pond and aquarium water. However, these spores can only infect fish and actually produce a disease, if the fish are "stressed" in some way. Overcrowding, drastic temperature fluctuations, unhygienic aquarium conditions and the like all predispose fish to fungal attack. Newly acquired fish may go down with fungus because rough handling has rubbed away some of the all important protective mucus layer of the skin. Therefore, at the same time as applying a reliable brand of remedy to your tank, you should also identify (and correct) the underlying cause of the disease. I have sent you a leaflet on the diagnosis and control of the diseases of fish. Be careful if you mix different brands of remedies, as some are not compatible.

An aquarist friend of mine has mentioned "eye-fluke" to me. What is it and can it infect my pond fish?

"Eye-fluke" is a parasite infestation of the lens or humour of the eye of fish, with the larval stage of a digentic trematode worm (often *Diplostomum*, see illustration). The parasite has a complex and very interesting life cycle. Certain aquatic snails are the first host, and these release many thousands of tiny, free-swimming parasite larvae into the water in the spring and summer months. These larvae actively penetrate the skin of fish, and migrate through the body to the eye, where they may cause blindness if present in large numbers. The last host in the life cycle is a fish-eating bird (e.g. seagull), which acquires the parasite by feeding on infected fish. Within the intestine of the bird the parasite rapidly matures and produces eggs which, on contact with water, hatch and (once again) infect snails. Many species of fish can become infected with eye-fluke in the wild or if,



(for example) infected snails are put into a tank or pond. However, this parasite is not often recorded as a problem to pet fish, which is fortunate since there is no treatment for the condition. Control may be achieved by eliminating snails (or fish-eating birds) from the environment.

I have recently purchased a three foot aquarium that I am going to set-up as a tropical freshwater community tank. I have read in one of your articles that all new fish should be quarantined before they are introduced into a set-up tank. Can you elaborate upon this?

If it is at all possible, I am very much in favour of using a quarantine tank to isolate all new fish for at least 7 days before they are introduced into stock tanks. This not only simplifies treatment, but may also permit the acclimation of fish to different water conditions.

The quarantine tank itself can be quite a simple affair: thermostat-heater, thermometer, poly-foam filter (or air-stone), air pump, and perhaps a plastic plant to provide refuge for the fish. It should be situated in a quiet corner where close observations can be made without disturbing the fish. All risks of contamination between this tank and the stock tank should be minimised, with a separate set of nets, scrapers, etc. for each.

In the quarantine tank the fish can be observed closely for symptoms of disease and treated where necessary. Some aquarists treat all their fish whilst in quarantine with a broad spectrum remedy, which may reduce the likelihood of introducing many external parasite infections. Between batches of fish the quarantine tank and its equipment should be washed in a dilute solution of household bleach, and then rinsed well in running water. Every so often the foam filter pad or air-stone will have to be replaced.

(P.S. I recently had an outbreak of Ich in one of my tanks at home because I did not quarantine some Cardinal Tetras. My quarantine tank was, at that time, being used to treat a friend's sick goldfish!)

What levels of nitrite are considered safe for tropical freshwater fish?

Nitrite is often measured in milligrams of nitrogen per litre of water (i.e. mg. N/L), 0.1 mg. N/L is harmless. Levels of 0.2-0.5 mg. N/L indicate that organic substances are not being broken down properly, and the fish may become more susceptible to

disease, and perhaps go off their food. The critical level is around 1.0 mg. N/L, when about two-thirds of the aquarium water should be replaced. Of course, some fish are more resistant to nitrite than others. Certain Characins are quite resistant whilst Swordtails and Guppies are more sensitive. I have sent you a leaflet on the nitrogen cycle and how it relates to the nitrite content of aquarium water.

This month's recommended reading:

"Parasites of Freshwater Fishes" (TFH) by Hoffman and Meyer (about £8.00).

An extremely useful review of the parasites of freshwater fish with detailed information on how they may be combated. Includes data on the toxicity of various medicaments to fish, and is well illustrated.

Footnote

The attached illustration is of *Diplostomum* (eye-fluke) from the eye of a Perch (*Perca fluviatilis*). Actual size of the parasite is less than one millimetre.

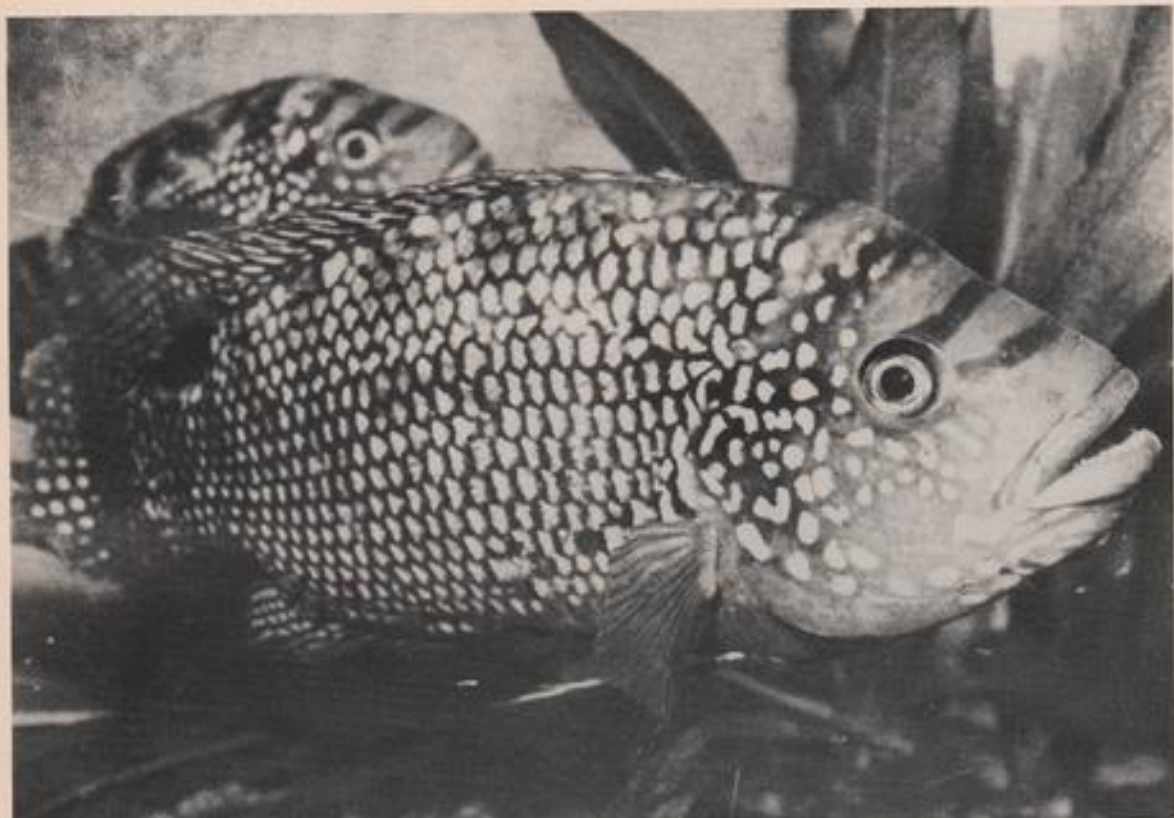
Commentary *continued from page 39*

we can choose the species which will survive our occasional mismanagement. If we ignore them we shall buy the temperamental types, which will die, and, as usual, we shall blame the trade. At all events we can state quite clearly that only those who are infallible and perfect in all ways and who never collect prize cards other than the red ones can ignore these cautionary words. They can buy what they like, mix all the species together and overcrowd them all. There cannot be many folk like this, despite what we may read elsewhere. But not many people in their senses would take on a St. Bernard or an Elkhound without a serious prior study of personal finance, personal habit and the culture requirements of these fine animals.

Similarly, no one should contemplate acquiring those £50 Angelfish which look so magnificent and so undemanding in the dealer's tank, but which prove quite unmanageable when they are decanted into your home aquarium. You may ask yourself why you cannot do what the dealer did. But what did the dealer actually do? He was only keeping that fish alive for the few days or weeks during which it was in his charge: you could have done likewise. What made the fish go off food and die shortly after you had bought it? Almost certainly, yet another water and environmental change so soon after several others proved to be the breaking point. Fortunately this sort of mischance does not happen every time, but the experienced mariner would have taken a number of steps based on his own trials and errors and may have succeeded in a trouble-free acclimatization. Even so, one should bear in mind that fish

and marines, seemingly especially so, are more individual than we would bargain for, so that despite an apparently perfect handling technique, the odd one does get the vapours and expires more from shock than any other cause, further adding to the reputation for instability which marines in general undeservedly carry with them.

Finally, a common misapprehension about marines is that they are automatically more brilliant and striking than freshwater fish. Certainly, body shape and general construction is a study all of its own, and there are many beauties as well as curiosities. Yet coloration is not as impressive as many would have us believe, and the real spellbinders may be numbered on the fingers of two hands. Some of the Butterfly-fish are quite dreary by comparison with many freshwater tropicals and with goldfish, so we must keep a sense of proportion. Another point to remember is that many of the most striking species are only really brilliant when small: others deteriorate in colour tones as they age. The white of the Heniochus, for example, is quite startling when first imported, but I have found that it becomes more silvery after a time, which detracts considerably from the appeal of this fine species. On the other hand, many freshwater tropicals start life as drab little things and finish with unmatched brilliance. Fancy goldfish, too, get better as they grow. The budding mariner will take these factors seriously before he makes his mind up. He should also recall that entry to marine fishkeeping is in no sense a promotion from the other branches of the hobby. An apprenticeship it may be, but it takes a real fishkeeper to so arrange things that his pair of fish produce a prizewinning Veiltail!



Male fish showing the patterning of large green spots

THE JACK DEMPSEY

Written & Illustrated by Jørgen Hansen

MY FIRST MEETING with *Cichlasoma octofasciatum*, the Jack Dempsey cichlid, was when I was a boy at the end of the 50's in the good old days, when cichlids mainly came from Central and South America. I had just got a tank containing 100 litres and by carefully buying things from my pocket money, it was nicely planted and the interior was, with great care, built up in terraces and at the edge of each a nice little row of rocks which were placed on top of the gravel. Finally, I had bought some neon tetras and some pearl gouramies and other species to make a beautiful community aquarium. Everything was nice until suddenly one day I stood

in an aquarium shop in front of a large tank containing cichlids. I knew at once that I had to be the new owner of these fish no matter how much they cost and how much trouble I would get. I brought the fish home with me and placed them in my community tank. In the beginning they were rather pale but later they got their bright colours and they were really beautiful among all the plants and the other peaceful fish. It was a satisfied aquarist who that night put out the light of the aquarium and went to sleep.

I can still remember how upset I was, when the next day I came home from school and saw my tank.

There was not a single plant left in the bottom layer, gravel and stones were not where I had carefully placed them, but were piled up towards the front glass, and the other frightened fish in the tank kept near the surface among the uprooted plants in the one end of the tank, while the two Jack Dempsey cichlids were happily moving more stones and gravel. Yes—that was at that time.

I got my other pair of Jack Dempsey 20 years later.

One Saturday morning the phone rang and an aquarist asked if I was interested in a pair of *Cichlasoma octofasciatum* and five Pirayas. I agreed to the first and an hour later the fish were in that aquarium (80 litres), which I had made ready for them. The male measured 18 cm. and the female 12 cm. The tank was built up with large bits of slate standing up along the side and back glass, and furthermore there was a big bit of slate placed on the bottom of the tank. There was a 10 cm. thick layer of gravel in the tank. In the one corner of the tank there was a single large Amazon Sword plant (*Echinodorus brevipedicellatus*), growing and its roots were protected by means of some large stones so the cichlids could not uproot it. The water in the tank was tap-water with a hardness of 14 DH and a pH value of 7. The temperature was 24° C, and the light was a 20 watt type, colour 32. There was a powerful aeration of the tank.

Cichlasoma octofasciatum was imported to Europe as early as in 1904 but at that time it did not have the popular name Jack Dempsey. It was later that it was named after the famous American boxer who became professional world heavy weight champion in 1919, and who later in 1926 lost the title to Gene

Tunney. The fish was in 1903 described by Regan as *Heros octofasciatus*, which must be named as the original description. Later in 1904 it was described by Meek as *Cichlasoma hedricki* and again by Regan in 1909 as *Cichlasoma biocellatum*. The latter is often seen in aquarium literature, but both *Cichlasoma hedricke* and *Cichlasoma biocellatum* must be said to be synonyms for *Cichlasoma octofasciatum*, which Robert R. Miller concluded in the beginning of the 60's.

Wolfgang Staeck mentions in his book *Cichliden* bind I, that there is a species called *Cichlasoma biocellatum* as well as a species called *Cichlasoma octofasciatum*, but as mentioned before only the latter is valid. According to R. Zúkal in the British magazine *PetFish*, October 1978, page 232-233, the natural surroundings of *C. biocellatum* should be the area around the middle of the Amazon river and Rio Negro, but both name and place must be said to be wrong. He has probably based his information on the fact that the German breeder Joh. Paul Arnold at some time in the period 1904-1909 sent Regan a bred specimen of *C. octofasciatum* with the information that it came from Manaos, Rio Negro, which later proved to be wrong, and Regan made a mistake when he in 1909 described the fish as *Cichlasoma biocellatum*. Sven O. Kullander is more accurate when he states that the fish is to be found in an area from Vera Cruz in South Mexico to Rio Ulua basin in Honduras, Guatemala. (*Akvariet*, No. 8, October 1975, page 379-383, and No. 9, November 1975, page 456-467).

Cichlasoma octofasciatum has a long and upright formed body where the basic colouring is greyish. Perpendicularly over the body there are eight more



Female with eggs and showing the dark bands across forehead

or less distinct dark bands. From the upper and nether part of the eye there are dark bands running over the forehead of the fish. The whole body of the fish is covered with green iridescent spots which give the fish a fantastic appearance. The mouth is big, and as is the case with the other members of the *Cichlasoma* genus, it has in each jaw a single row of conical teeth.

C. octofasciatum grows in nature to a length of 13 cm., while in aquariums it can attain a size of 15-20 cm. for males, while females are smaller. The sexes are similar in colouration—monomorph.

C. octofasciatum is sexually mature when it is nearly one year old and has a size of 6-7 cm. It is not difficult to see when the fish are ready for spawning as the ovipositor of the female becomes visible, big and swollen. The male's genital papil also becomes visible but is smaller and thinner than the one of the female. At about the time when the breeding tube is revealed the fish will start to defend their chosen territory against other fish and at the same time they will start cleansing a somewhat flat stone or, as in my tank, a bit of slate. Both fish will do the cleansing and will press their mouths against the chosen spot to bite off the dirty particles.

When the spawning site has been cleaned thoroughly the spawning begins. The female swims close over the stone and releases a row of eggs which the male thereafter fertilizes in a similar way. And so they will continue for more than half an hour until all the eggs have been laid. Young fish will spawn about 200 eggs while older and bigger fish can spawn up to 2,000 eggs. The eggs are 2 mm. in diameter and yellowish and they stick on to the surface. After 2 days at 24-26° C they will hatch. The small fish larvae are moved by the parents to a hollow dug in the gravel. After another 3 days the fry are swimming and now one can witness one of the most touching performances that can be seen by an aquarist. A dense swarm of fry herded about in the aquarium by their parents searching for food. In the evening

the whole swarm will be put to bed in the hollow, and if there should be a single one with the spirit to go about on its own, the parents will immediately swim up to it, suck it into the mouth and transport it back to the hollow where they will spit it out.

The fry can from the very first day of their lives eat *Artemia*, and when they are a week old one can start feeding them with *Cyclops* and small *Daphnia*. When they have reached the age of two months they should have obtained a size of 3 cm. if they have been fed well.

The adult fish were fed a varied diet comprising mosquito larvae, *Daphnia*, fish balls, minced beef meat, small bits of beef heart and small bits of fish fillets. When the fish are large it is not necessary to feed them every day and in any case one should not give them more than they can eat within 10 minutes. This avoids remains of food laying about in the tank and polluting it.

Summary

Cichlasoma octofasciatum is a medium sized very beautiful American cichlid which enjoys digging in the substrate. Therefore one should always decorate the cichlid tank in such a way that the general impression of the interior of the tank does not get changed or spoiled even if the gravel is moved about. All the stones should be of such a size that the fish cannot move them about and they should be standing direct on the bottom so that even if the gravel is moved away they will not slide down or turn over. Along the back of the tank one could put some big tree roots and stones so a lot of hide-outs are formed where a nervous or hunted fish can hide. There should either be strong aeration or better a strong power filter which can keep the water clean.

If the aquarium has been decorated according to the needs of the fish and the owner, then there is no doubt that it will result in an unforgettable acquaintanceship.

ADVANCE NOTICE

THE FEDERATION OF NORTHERN AQUARIUM SOCIETIES

Members of The Confederation of United Kingdom Aquarists

present



THE 28th BRITISH AQUARISTS' FESTIVAL

EUROPE'S BIGGEST AND BEST AQUARISTS' SHOW

at

BELLE VUE ZOOLOGICAL GARDENS, MANCHESTER

on

SATURDAY AND SUNDAY 1st 2nd SEPTEMBER 1979

MEMORY IN FISH

by Clive R. Hollin

IN A PREVIOUS ARTICLE (*Aquarist and Pondkeeper*, February 1979) I complained about the lack of attention given to the behaviour of fish—or piscine psychology, as I termed it—in popular publications devoted to the hobby of fishkeeping. In that article I explored the neglected topic of the sleeping habits of fish, specifically asking if fish could dream. In the present article I wish to turn my attention to the question of whether or not our fish have the ability to recognise us, their owners.

In other words, does your fish know who you are?

While seeming, on the face of it, quite a simple question several important issues are raised which require elucidation and consideration prior to making any attempt to answer this question. Perhaps a good starting point is to ask whether fish are capable of recognising each other. I'm sure most enthusiasts would agree quite readily that fish are aware and do take note of other fish of the same species. The issue then becomes whether or not we can call this awareness recognition.

Awareness

An experiment by the scientist, Tinbergen, provides information which helps towards coming to an answer. When a male stickleback encroaches into another's territory the resident will fiercely attack the intruder, attempting to drive him out of the possessed area. In order to do this it seems logical to suppose that the owner must recognise the intruder as a fellow stickleback. However, Tinbergen demonstrated that this is not the case. A wax sausage, painted red on the underside like a male stickleback, was found to elicit the same aggressive reaction from a territory-possessing male. The wax sausage bore no resemblance to a fish—it had no fins, no eyes—but was, nevertheless, attacked. When the sausage was turned over the aggressive behaviour ceased. Thus the stickleback was reacting not just to "red" but rather, as Tinbergen phrased it, to "red underneath".

A further, more complex, description of such a pattern of events has been recorded by the scientist Seitz.

Key stimuli

Seitz made the observation that the males of one cichlid genus (being blue with distinctive black markings on both the dorsal and ventral fins) would face adversaries in the following manner: first fins were spread wide, then tail strokes were aimed at the opponent's head and finally the attacking male would hold its jaws wide open and ram the approaching male. Thus, should a male cichlid observe such characteristics—blue colouration, spread fins, tail strokes and ramming—a highly threatening reaction is provoked. In experimentation Seitz found that each of these characteristics, or key stimuli as he called them, if presented separately (using a dummy) provoked the threatening reaction. Furthermore, if all the stimuli were artificially presented at the same time the reaction became still stronger. Indeed, the ratio of effectiveness of the provoking stimuli could even be accurately recorded in numerical terms. Seitz called this the *Reizsummenphänomen*, or accumulated stimulus phenomenon.

Thus it is almost certainly true to say that fish do not recognise other fish as fish, but rather react to a set of what may be complicated stimuli. It is plain that the above examples do not indicate true recognition but rather they illustrate instinctive, innate behaviour. The various physical and behavioural characteristics such as those discussed above are "releaser mechanisms" for an appropriate form of behaviour—anything ranging from aggression to courtship.

Such innate behaviour is controlled by nerve structures whose composition is determined by the heredity dictates of the organism's chromosomes.

This is not, however, the end of the story. Fish owners will, I know, readily tell of antics their fish will perform at feeding time, or in response to some other cue. Does this then mean that fish from every far flung corner of the globe have a genetic constitution which causes them to instinctively react to their English owners? This, I'm sure you'll agree, is rather an unlikely gift from mother nature! However, this does raise the next point that behaviour of this sort must be, in some way, acquired. The process by which behaviour is acquired is called learning.

Learning

The basic requisite for learning is, simply, that particular environmental events must leave some impression on the organism's central nervous system. The organism must therefore be able to selectively perceive and store details concerned with its immediate environment. In other words, it needs that faculty which we call memory.

Can fish learn and do they have a memory? The evidence very much indicates that they can and do. Indeed, whilst it is a matter of current debate as to whether simple unicellular organisms such as protozoa possess memory, the faculties of learning and memory have been clearly demonstrated in very primitive flatworms (*planarian*). In 1967 two investigators, Block and McConnell, furnished evidence which strongly suggested that it was possible to train, or condition, such flatworms to distinguish between vibration and light.

Memory

If such simple organisms are capable of this level of achievement then it is hardly surprising to learn that it has been possible to train fish to make a wide variety of distinctions and carry out various complicated tasks. Furthermore, fish can remember such details for a fair length of time afterwards: the cuttlefish has been shown to retain a memory impression for 27 days, whilst in the trout memory has survived for 150 days. The record is probably held by the carp which demonstrated memory of a behavioural change for some twenty months.

Whilst there is still widespread debate on the exact form that memory traces take, there is no doubt that the central nervous system of the fish is able to store a memory of a past experience. Thus fish may be said to learn from environmental events. For example, just after switching on the lights in my tanks I always feed my fish; over a period of time the fish have learnt the association between light and food, thus as soon as the light is switched on they come to the surface in anticipation of food.

Given that this ability exists the question now becomes one of the degree of sophistication. In other words, whilst a fish can learn to remember things, is it able to make such fine distinctions so as to know, like a dog, individual people? While there is no concrete evidence to say yes or no my own opinion is that fish would not be capable of making such refined performances as animals higher on the evolutionary scale.

A fish might learn to react in a certain way when its owner feeds it, perhaps even taking food from the hand, but will only do so for one individual? I should be intrigued to hear from readers who have shown that their fish react to them *only*.

So, in answer to the initial question, I think it is unlikely that our fish are able to recognise one person as distinct from another. What is more feasible is that they are able to recognise a particular cycle or events—probably involving some reward such as food—in which the owner plays a vital part and thus becomes an indistinguishable part of the sensory impression, the memory, of that event.

B.K.K.S. NEWS

The British Koi-Keeper's Society held their national A.G.M. at the Botanical Gardens in Birmingham on May 13th. This new venue proved very popular as the meeting was very well attended. First on the agenda (before the more serious matters of the day began) was a slide show and informative talk by the chairman, Roland Seal, on the names of the various colours and patterns given to koi. Later, it was reported that we now have 852 members and that we are the largest specialist fish society in the country. It is envisaged that we could be 1,000 strong by next year, this must surely be due to the B.K.K.S. magazine which is posted to members twelve times a year. The subscription charges will remain unchanged: £6 single membership, £6.50 married couple.

Two 12 inch koi, a Yamatonishiki, and a Shiro

Utsuri, were specially purchased in Japan for the occasion and were won by Tony Gibbons (Wessex section) and Keith Dean (Norwich section). Nice to see them going to members that had travelled so far. The Honorary Life Members are Hilda and Eric Allen. Honorary Members Mr. L. E. Perkins and Mr. Norman Wright. The committee members are:

CHAIRMAN/EDITOR: Mr. Roland Seal.

ASSISTANT EDITOR: Mr. Bill Fowler.

TREASURER/MEMBERSHIP SECRETARY: Mr. Malcom Waumsley.

GENERAL SECRETARY: Mr. Ron Hodgson.

PUBLIC RELATIONS OFFICER: Mrs. Gill Minchin.

All membership details can be obtained from Mr. M. Waumsley, 165 Woodside Rd., Amersham, Bucks HP6 6NR.

WATERLILY HYBRIDIZATION

by Philip Swindells

WITH MOST GENERA of plants the means by which new hybrids were derived, together with their parentage is often a mystery. An aura of secrecy surrounds the methods used by their creators, either because of commercial considerations, personal pride, or else to create a mystical climate conducive to engendering public interest in the new and wonderful hybrid being launched on the market.

Waterlilies have suffered more than most from this kind of treatment, the most important and successful hybridizer Latour Marliac taking the secrets of his life's work to his grave. From reports of the time it would appear that he was not only evasive about his techniques and the parentage of his hybrids, but on occasions tried to throw enquirers off the scent by giving dubious information. However, despite his shortcomings as a mentor, it cannot be disputed that he was the greatest waterlily hybridizer the world has known.

Leading Hybridizers

Achievements of other hybridizers in the hardy waterlily field have been negligible compared with those of Marliac. Indeed, Mrs. Frances Perry, one of the most important authorities on aquatic plants in Great Britain, and daughter-in-law of probably the most successful raiser of new varieties in this country, the late Mrs. Amos Perry, stated in her authoritative work on water gardening, "The hybridization of waterlilies is generally so much fruitless labour, and the results far from encouraging. Out of 159 recorded crosses we made in 1927, only one pod set seed, and the offspring was no better, and indeed, not as good as many of the existing varieties." In fact, if one studies the achievements of various introducers of new hardy cultivars, it will be discovered that in a good number of cases these are selected forms or improved seedlings of a species rather than a direct cross between two distinct parents.

With tropical waterlilies we are a little more fortunate,

for the most successful hybridizer, Mr. George Pring of the Missouri Botanical Garden, St. Louis, kept records of his work and divulged freely of his successes and failures. For the following account of Mr. Pring's efforts in this field I am indebted to Mr. Stephen Wolff of the Missouri Botanical Garden who has given me every assistance in my quest to ensure accuracy.

Tropical Waterlilies

Mr. Pring began experimenting with tropical waterlilies in 1915 with the intention of producing a white hybrid of good size and form. He was assisted in his quest by Mr. Peter Bisset's introduction of seed from Africa of *N. ovalifolia* and the subsequent successful rearing of seedlings by Mr. E. T. Harvey of Cincinnati. *Nymphaea ovalifolia* is a vigorous grower with large white flowers tipped with blue, but unfortunately has far fewer petals than is horticulturally desirable. *Nymphaea ovalifolia* was then crossed with *N. castaliiflora* (a hybrid made by Pring in 1912 between two light pink forms of *N. capensis* var. *zanzibariensis*). The resulting seeds germinated freely and produced a plant with large blue flowers which aged to off-white. This was *N. 'Mrs. Edwards Whitaker'*.

Using *N. 'Mrs. Edwards Whitaker'* as a staminate parent and *N. ovalifolia* as a pistillate parent, blue flowered plants were produced. However, a reciprocal cross resulted in white becoming the dominant colour. The best white form showing the typical flower and leaf characteristics of *N. 'Mrs. Edwards Whitaker'* was selected and during the summers of 1920 and 1921 was self-pollinated, its progeny producing white flowers. The best of these were reselected and self-pollinated and gave rise to plants with blossoms of increased size and with more numerous petals. Continued selection to eliminate those with infusions of pink or blue carried on until the desirable white form was fixed. This was achieved in 1922 and named *N. 'Mrs. George H. Pring'*.

The interesting thing about *N. 'Mrs. George H. Pring'*

is that its parentage was dominantly blue. Previously *N. flavo-virens*, a pure white Mexican species, had been hybridized with various forms of *N. capensis* var. *zanzibariensis*, but in the resulting seedlings white was recessive and hybrids thus yielded, like *N. 'Mrs. C. W. Ward'* and *N. 'William Stone'*, possessed the stellate blossoms of *N. flavo-virens*.

In 1929 the introduction of the yellow flowered *N. burtii* from Tanganyika provided Mr. Pring with additional valuable material. In 1930 he made 86 crosses with *N. burtii*. One between *N. burtii* and *N. 'Independence'* produced seedlings with pink and blue dominant and yellow recessive, but all of viviparous habit. The pale blue of the second generation when selfed produced yellow as the dominant colour, but with the dark blues and pinks, yellow was again recessive. The original cross made with *N. burtii* as the staminate parent yielded the pale blue colour and in the second generation showed yellow dominant. However, when *N. 'Independence'* was the staminate parent, blue and pink were always dominant. Only when *N. burtii* was crossed with a white such as *N. 'Mrs. George H. Pring'* was yellow dominant and all the other colours recessive. Curiously when crossed with the white *N. ovalifolia*, yellow and blue proved dominant and pink and white recessive. Subsequently amidst these complexities Mr. Pring produced a fixed yellow of outstanding merit and called it *N. 'St. Louis'*.

Cultivars

This then is an outline of the important landmarks and discoveries in Mr. Pring's work. He, and latterly other hybridizers like Martin Randig and Perry Slocum, have built on this knowledge and developed some truly wonderful cultivars. Of course it must not be thought that Mr. Pring alone forged the way ahead for modern tropical waterlily hybrids, for sterling work was performed by Mr. E. Sturtevant, Mr. William Tricker and Mr. Peter Bisset in earlier years. However, it must be said that Mr. Pring made the important colour breaks and kept the best documented breeding programme and for this he deserves due credit.

From the multiplicity of cultivars available one might suppose that waterlily hybridizing has outlived its usefulness, but there are still mountains to climb, particularly with the hardy varieties where the gorgeous blues of the tropics are totally lacking. Who will take up the challenge is difficult to say, for space and capital are necessary to implement a comprehensive breeding programme. The keen hobbyist can make a contribution though, if he has the inclination. An average sized prefabricated pool and a tub or two will hold a surprising amount of material. For those interested in pursuing this further the following short account of pollination and seed collection may be of some value.

Seed production

The blossom selected for seed production must be

protected from insect pollination and emasculated in order to ensure a pure cross. This must be done in the late bud stage and involves removing the stamens in order to prevent self-pollination. The experts use forceps, but pointed scissors are usually quite adequate. Both scissors and fingers should be sterilized in methylated spirits before starting emasculation and as often as different varieties are handled. This should be wiped off or allowed to evaporate before emasculating otherwise the delicate surface of the stigma may be damaged.

Emasculation should be performed as late as possible before the anthers erupt and if perchance they burst during the operation then the entire flower should be discarded. In order to remove the stamens it is generally acknowledged that a number, if not all the petals should be removed. I find this unnecessary in the majority of cases and prefer to leave the flower intact. Without the protection of the petals the delicate styles may dry up. Also by preventing the various portions of the flower from fulfilling their natural function, premature detachment of the flower stalk is likely.

Pollination

On the first day of opening, the centre of the prepared flower will be full of nectar. It is at this time that pollination must take place. This involves taking the anthers containing pollen from the chosen male donor and placing it on the pistil of the selected seed parent. The process having been completed the entire bloom should be enclosed in a muslin bag to exclude the attentions of insects. Mr. Pring recommended that a string be attached to the flower stem and secured to a stake near the crown of the plant to assist with easy inspection of the developing seed pod, as with most kinds once pollination has been successful the old flower head closes tightly and thrusts itself down into the water in order to prevent the developing seeds drying out. Once the seed is ripe the pod will rise to the surface of the water, rupture, and scatter its seed. If the muslin bag is attached properly the seed will be retained. To ensure that only viable seed is sown float the contents of the bag in a jar of water. The seeds that fall to the bottom within five or six days will be the virile ones.

Finally I must make an important point here regarding the results likely to be achieved. In the first place a lot of mediocre material will result from an initial cross and the majority of seedlings will have to be discarded. The second generation is where things may start to happen, but not necessarily the way one may expect. Initial selection from a first cross will probably mean the retention of seedlings with desirable characteristics, but it is one of the frustrations of plant breeding that a promising first generation plant does not necessarily yield a better second generation plant. Often the useful second generation progeny is begat by a mediocre seedling from the first cross. Such is the frustration and fascination of hybridizing.

READERS'

LETTERS

Goldfish Bowls

Any establishment that carries on the business of selling live animals to the public surely has a moral responsibility to see that the public knows how to best look after the interests of those animals, and I personally would like to see some form of basic training being made compulsory for anyone intending to start up a pet shop.

One area in particular causes me much concern: the continued production and sale of those most cruel of containers, round goldfish bowls with a narrow mouth. A little thought about the needs of fish would surely reveal how detrimental this particular type of environment is. In a fish's natural surroundings the light comes from above, not from below or from the side. Fish also need plenty of oxygen in the water, which is drawn in from the surface exposed to the air. In a narrow-necked bowl the area exposed to the air is extremely small and in no time the oxygen in the water is used up and not adequately replenished.

A further drawback, largely accounted for by the bowls' size and encouraged by the media and other agencies who should know better—is that seldom are pondweed, gravel or any other form of interest and comfort provided. Quite apart from the monotony of an existence eternally swimming round the sides of a barren bowl, the fish can suffer discomfort from the light and needs somewhere to shelter. Pondweed has the added advantage of helping to keep the water pure.

It is a regrettable fact that many charitable organisations (in addition to the traditional fairgrounds) still insist on offering live goldfish as prizes, with no advice given as to how to look after them. These fish have spent a considerable time enclosed in plastic bags. Those that manage to survive a bewildering journey swinging about in these bags, often end up in a round goldfish bowl under conditions described above, which is like jumping from the frying pan into the fire; the mortality rate must be incredibly high.

It would be nice if all those people who trade in goldfish, in whatever capacity, would put a little less emphasis on financial gain, and more on encouraging the public to look after these creatures

better, by refusing to trade in goldfish bowls and by making readily available unbiased, unprejudiced information on the fish's welfare.

(MRS.) B. E. HARDWICK.

"Sparrows Roost,"
Dunley, Stourport-on-Severn,
Worcs. DY13 0UE.

Bleeding heart tetras

In recently looking through the March 1979 issue I noticed on page 493, an article by Alan Rothwell with an identification of one of the bleeding heart tetras. The scientific name used is, so far as I can tell, "out of date." There appear to be two species, one *Hyphessobrycon erythrostigma*, the species we have all known as *H. rubrostigma* for so many years and *Hyphessobrycon socolofi*, a species described as new in the enclosed paper. The species illustrated in your magazine is *H. socolofi*. Both species are very closely related and are being confused by aquarists. I can hardly blame them, females especially are very difficult to tell apart.

STANLEY H. WEITZMAN,
Curator,
Division of Fishes.

National Museum of Natural History,
Smithsonian Institution,
Washington, D.C.

Mycobacterium marinum

In his article "The real fish diseases" in your June issue, Dr. Ford mentions the potential pathogenicity for man of *Mycobacterium marinum*. The important point about these infections is that they are caused by the organism entering the skin through minute cuts and abrasions and aquarists would be well advised to wear rubber gloves whilst cleaning tanks etc. Starting a siphon by sucking the tube is unlikely to give rise to disease as the organism can only infect the superficial layers of the skin. It has an optimum temperature for growth of between 25 and 30°C and thus is incapable of causing infection in deeper tissues where the temperature is 37°C. Other organisms in the water may of course cause gastrointestinal upsets so "sucking the tube" is not to be recommended.

Your readers may be interested to know that *Myco. marinum* has caused outbreaks of "swimming pool granuloma" in a number of countries. Again the organism penetrates the skin through cuts and causes lesions identical with those seen on the hands and arms of aquarists.

P. A. JENKINS, Ph.D.,
Mycobacterium
Reference Unit,
University Hospital of Wales,
Heath Park, Cardiff, CF4 4XW.



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.

A WELCOME visitor to **Bristol A.S.** was Mr. Les Dodge from Stroud. Speaking from 30 years' experience of keeping Moors, he gave as his opinion that males with shorter tails prove the most active when spawning. He also thought that outcrossing with other metallic twinstails to improve finnage was a retrograde step.

THE East London Aquarists and Pond-keepers Association announces that Mr. Alf Field is their new president. He has been associated with the B.L.A.P.A. for a number of years and has been a very active member of the club committee.

THE Cannock & District A.S. meets each 1st and 3rd Tuesday every month at the "Progressive Working Men's Club," Market Hall Street, Cannock. On 26th June, the society visited the Staffordshire Agricultural College, at Rugeley. At the meeting on the 1st July, they held an inter-society match with Wolverhampton Aquarist Society, and again had an enjoyable evening, even though W'ton beat Cannock 26 to 14 points. There was also a talk on Reptiles given by Mr. F. Soodley, ably assisted by some of his friends. Several Reptiles and Amphibians were on show. The meeting on 7th August will be at the Chelf Road Community Centre, at Stafford, where the return match with Stafford Aquatic Society will be held. Other activities have also been organised, and more information can be obtained from Mr. R. Potts, Hon. Secretary, 25, Oaks Drive, Cannock, Staffordshire WS11 1BU. Visitors and new members are always welcome.

At the June meeting of **Malvern & District A.S.**, the club played host to Evesham Fish-keepers Society in a six a side match and quiz. The result of the quiz was a win for Evesham by one point following several tie breakers, and the table show resulted in a win for Malvern by 908 points to 854 points. Many thanks to Mr. Don Hutchinson who travelled at short notice to judge.

The club meets on the first Monday of each month at St. Joseph's School hall, Newtown Road, Malvern and new members are always welcome.

At the monthly meeting of the **Mid-Sussex A.S.** at Ockley Lodge Keymer, it was stated that the Interclub held on 3rd June was a success. The class for 'Novices' was omitted from the programme, but will be included in the October meeting. 'Barbs' will now be September. Most important, the October meeting will be on the first Thursday (4th). Congratulations were given to John and Gerald Birch on the birth of their daughter; also to Chris and Sally Corbin on the birth of their baby daughter. The 50 club draw was held; prizes went to Sandy Tesser, Barbara Temple, and Ray Young. The talk for the evening was given by Andy of Aqua Culture, the subject being Fish Disease. A very interesting talk, showing what the various diseases look like

on the fish and how to distinguish them from each other.

The table show was judged by Bill Slade and Jim Bartles, and is as follows:—G. Catfish: 1, L. Pinney; 2 and 3, E. and T. Tester. H. Corydoras: 1, L. Pinney; 2 and 3, J. Birch; 4, P. Levine. C. Characins: 1 and 2, E. and T. Tester; 3 and 4, L. Pinney.

Meetings are held on the first Thursday of each month at Ockley Lodge, Ockley Lane, Keymer. Anyone interested is welcome to attend a meeting. Further information from the Secretary, Mr. John Birch, 11a Sandrocks Way, Haywards Heath, West Sussex (Phone: H. Heath 50585).

THERE were 327 entries for the **Arbroath A.S. Open Show Results**—Key: Ab: Aberdeen; Ar: Arbroath; D: Dundee; Du: Dunfermline DAS; E.K.: East Kilbride; BAP: Edinburgh Aqua Pond; F: Forfar DAS; G: Gorgie; K: Kirkcaldy; La: Lanarkshire; Li: Livingston; Lo: Lochgelly; M: Mitchell; N: Newbattle; NGLS: Newcastle G.L.S.; P: Perth. T.V.: Tay Valley.

Guppies: 1, M. Gillan (Ar); 2, G. Hepburn (Lo); 3, J. Hopkins (TV); 4, A. Robertson (Lo). Swords: 1, D. Dwyer (P); 2, I. Henry (Du); 3, H. Buchan (M); 4, L. Walker (N). Mollies: 1, A. Wicksted (L); 2, J. Fettes (Ab); 3, I. Baird (EK); 4, H. Buchan (M). Platies: 1, A. Robertson (Lo); 2, T. Crawford (L); 3, A. Scott (N); 4, K. Jones (G). A.O.V. Live: 1, J. English (NGLS); 2, A. Crawford (K); 3, J. Milligan (BAP); 4, J. Steven (Ar). Characins A: 1, R. Park (M); 2, A. Wicksted (L); 3, R. S. McIntosh (L); 4, D. Tait (N). Characins B: 1, E. Mann (P); 2, A. Crawford (K); 3, A. Rodger (Du); 4, A. Wicksted (L). Characins C: 1 and 2, A. Rodger (Du); 3, I. Baird (EK); 4, B. Mann (P); 5, B. Mann (P); 6, D. Dobbie (Du); 7, B. Mann (P); 8, A. Rodger (Du); 9, J. Hamilton (P); 10, A. Crawford (K). Dwarf Cichlids: 1, J. Walker (N); 2, S. Sturton (Ab); 3, R. S. McIntosh (L); 4, D. Brighty (D). Angels: 1, J. Fettes (Ab); 2, D. Angus (Ab). Large Cichlids: 1, B. Coull (Ar); 2, A. Robinson (Ar); 3, A. Wotherpoon (L); 4, A. Harrison (P). Rift Valley Cichlids: 1, A. Harrison (P); 2, A. Wicksted (L); 3, A. Harrison (P); 4, L. Moore (Ar). Siamese Fighters: 1, P. Deans (T.V.); 2, A. Robertson (Lo); 3, G. Hepburn (Lo); 4, A. Crawford (K). Trichogaster Sp: 1, J. Hopkins (T.V.); 2 and 4, G. Marshall (P); 3, T. Crawford (L). Colisa Sp: 1, J. Hopkins (T.V.); 2, K. Jones (G); 3, L. Walker (N); 4, M. Troup (Ab). A.O.V. Anabantid: 1, A. Crawford (K); 2, A. Harrison (P); 3, M. Nairn (Ar); 4, D. Brighty (D). Cats A: 1, A. Wotherpoon (L); 2, E. Mann (P); 3, J. Walker (N); 4, G. Mennie (Ab). Cats B: 1, P. Deans (T.V.); 2, D. Muir (N); 3, J. Steven (Ar); 4, J. Walker (N). Loaches: 1 and 2, A. Scott (N); 3 and 4, J. Walker (N). Danios: 1, I. Henry (Du); 2, J. Hopkins (T.V.); 3, A. Crawford (K); 4, A. White (K). Rasboras: 1, A. Crawford (K); 2 and 3, A. Rodger (Du); 4, K. Jones (G). Sharks: 1, J. Walker (N); 2, E. Mann (P); 3, J. Fettes (Ab); 4, A. Longmuir (P).

Minnows: 1 and 2, J. Walker (N); 3, J. Hopkins (T.V.); 4, I. Henry (Du). E.L.T.C. (Killies): 1, A. Bean (Ab); 2, J. Walker (N); 3 and 4, A. Robinson (Ar). A.O.S. Egg: 1, T. Crawford (L); 2, J. Steven (Ar); 3, A. Rodger (Du); 4, J. Walker (N). Pairs Live: 1, J. English (NGLS); 2, D. Muir (N); 3, I. Baird (EK); 4, B. Rae (F). Pairs Egg: 1, H. Boyd (G); 2, A. Rodger (Du); 3, L. Walker (N); 4, J. English (NGLS). Breeders Guppy: 1 and 3, J. Milne (Du); 2 and 4, G. Hepburn (Lo). Breeders Platies: 1, T. Crawford (L). Br. Mollies: 1, D. Strachan (Ar); 2, G. Mennie (Ab); 3, A. Berry (Ar). Br. A.O.S. Live: 1 and 2, R. Foster (K); 3, G. Hepburn (Lo); 4, M. Troup (Ab). Br. Egg D: 1, D. Angus (Ab); 2, D. Watson (P); 3, D. Strachan (Ar); 4, R. Foster (K). Br. Egg C: 1, D. Tait (N); 2, A. Robertson (Lo). Br. Egg H: 1, D. Angus (Ab). Br. Goldwater: 1, Mrs. F. Kennedy (Ar). Common Goldfish: 1, W. Davidson (Ar); 2, Mrs. F. Kennedy (Ar); 3, B. Rae (F). Shubunkin: 1, 2 and 3, Mrs. F. Kennedy (Ar). Fancy Goldfish: 1, D. Muir (La); 2, I. Baird (EK). A.O.S. Goldwaters: 1, M. Gillan (Ab); 2, J. Milligan (BAP). Plants: 1, M. Troup (Ab). Juniors: 1, D. Angus (P); 2, P. Martin (Ar); 3, J. Milne (Du); 4, J. Milne (Du).

Trophy winners—Best Livebearer, J. English (NGLS); Best Characin, A. Rodger (Du); Best Barb, P. Mann (P); Best Cichlid, A. Harrison (P); Best Dwarf Cichlid, J. Walker (N); Best Anabantid, A. Crawford (K); Best Catfish, P. Deans (T.V.); Best Loach, S. Shark, J. Walker (N); Best Toothcarp, A. Bean (Ab); Best A.O.S. Egglayer, T. Crawford (L); Best Pair, J. English (NGLS); Best Br. Livebearer, D. Strachan (Ar); Best Br. Egglayer, D. Angus (Ab); Best Goldwater, M. Gillan (Ab); Best Plant, M. Troup (Ab); Best Society, Aberdeen (AS); Best Exhibitor, A. Rodger (Du); Best Fish Gold Pin, J. English (NGLS).

THE 52nd Scottish Aquarium Society's annual open show will be held in the McLellan Galleries, Sauchiehall Street, Glasgow from Friday 19th October to Sunday 21st October. Further details maybe had from Dr. A. Young, Hon. Secretary, 9 Spence St., Glasgow G20, or from Mr. W. Hamilton of 18 Dunn Street, Paisley PA1 1NY, the Show Manager. This year they are trying the experiment of carrying on the show over Sunday in the hope that more hobbyists can attend.

THE New Forest A.S. held a well attended June meeting at the Phenix Room, Community Centre, Lymington. The main item was a fish Crossword composed by a member, Mr. P. Norup, who used fish names etc. and other topical subjects. It caused much amusement as well as being of good educational value.

Table Show Results—Any other Species Catfish: 1, T. Kirby; Guppy: 1, R. Trayer. Labyrinths: 1 and 2, T. Kirby; 3 and 4, P. Norup. Bristol Shubunkin: 1, 2 and 3, L. Menhennet.

A NEW fish "personality" captured the public's imagination at the best ever **Salisbury & District A.S.** open show, held in the city's Activity Centre on 17th June. "Snakie," a superb two foot long Snakehead, owned by host-club member John Hoare, was undoubtedly the aquatic star of the show as he paraded up and down his 40 gallon show tank. "Snakie," though the firm favourite of the public who packed the hall, did not fare so well with the judges, how ever—since he is still a baby yet. . . . He finished up as one of the many high quality also-rans in Class M, which carried the F.R.A.S. Championship Trophy, and which was won by a Mud-skipper owned by Stroud member, Mr. C. Fittins. The 565 entries made it one of the largest shows in the area this year. Competitors came from as far afield as Plymouth and Birmingham, but the coveted "Best in Show" stayed at home.

going to the Show Manager Stan Pitcher's Trophies Moorii in Class Dc.

Results—Class Ba: 1, F. May; 2, C. Finnis; 3, R. F. Adams; 4, A. G. Wing. B: 1, T. Dowell; 2 and 3, Mrs. D. Cruickshank; 4, Mrs. R. Bebb. Ca: 1, D. Rigiani; 2 and 4, J. Handley; 3, T. Dowell. Cb: 1, B. Witteridge; 2, C. Richards; 3, D. Rigiani; 4, T. Dowell. C: 1, P. Lawrence; 2, P. Fitchett; 3, T. Cruickshank; 4, R. Price. Da: 1, Mrs. S. Larkin; 2, Mrs. J. Gale; 3, P. Lawrence; 4, A. G. Wing. Db: 1, C. Richards; 2, D. Goss; 3, J. Jackson; 4, D. Kerr. Dc: 1, D. Kerr; 2 and 4, D. Edlstein; 3, S. Pitcher. Dcb: 1 and 2, S. Pitcher; 3, D. Rigiani; 4, A. May. Dc: 1 and 2, D. Edlstein; 3, W. Knight; 4, S. Pitcher. D: 1, D. Jennings; 2, S. Pitcher; 3, D. Edlstein; 4, J. Hoare. Ea: 1, R. Prior; 2, T. Cruickshank; 3, C. Richards; 4, T. Jennings. Eb: 1, R. P. Adams; 2, A. Hart; 3, R. and J. Briddle; 4, J. Tucker. E: 1 and 4, R. P. Adams; 2, D. Kerr; 3, C. Finnis. Fb: 1, R. P. Adams; 2, B. Witteridge; 3, J. Jackson; 4, B. Witteridge. F: 1, 3 and 4, R. Price; 2, P. Cripps. G: 1, Mrs. P. Gallop; 2, W. West; 3, D. Rigiani; 4, C. Richards. H: 1, W. Knight; 2, T. Cruickshank; 3, D. Kenwood; 4, B. Witteridge. J: 1 and 2, D. Goss; 3, Mrs. R. Bebb; 4, B. Witteridge. K: 1, J. Varnell; 2, D. Goss; 3, T. Dowell; 4, J. Jackson. La: 1, C. Richards; 2, J. Paul; 3, J. Varnell; 4, J. Paul. L: 1, C. Finnis; 2, N. Jackson; 3 and 4, C. Richards. Ma: 1, N. Davine; 2, R. Porth; 3, C. Richards; 4, T. Cruickshank. M: 1, C. Finnis; 2, P. Ross; 3, Mrs. R. Bebb; 4, W. West. Nbn: 1, P. Lawrence; 2, R. Smallwood; 3, D. Lilly; 4, J. Jackson. Nos: 1, Mrs. R. Bebb; 2, D. J. Kerr; 3, W. West. Nt: 1, C. Finnis; 2 and 4, D. Kenwood; 3, A. G. Wing. O: 1, 2 and 4, F. May; 3, C. Richards. P: 1, 2 and 3, C. Finnis; 4, W. Holland. Q: 1, Mrs. R. Bebb; 2, C. Richards; 3, J. Handley; 4, W. West. R: 1, W. Knight; 2, P. Cripps; 3, D. Kenwood; 4, D. Edlstein. S: 1, C. Finnis; 2 and 3, Mrs. R. Bebb; 4, W. West. T: 1, C. Richards; 2 and 4, M. Mansbridge; 3, Mrs. R. Bebb. Ua: 1, Miss J. Rundle; 2, G. J. Axe; 3, R. Smallwood; 4, R. F. Adams. Uc: 1, 2 and 3, Miss J. Rundle; 4, K. Forward. U: 1 and 2, G. J. Axe; 3, L. Menhennet; 4, T. Jennings. Vaf: 1, D. Jackson. Vh: 1, 2 and 4, F. Orme; 3, D. Jackson. V: 1 and 2, G. J. Axe; 3, C. Jackson; 4, K. Forward. Wb: 1, W. West; 2, D. Rigiani. Wc: 1 and 2, G. J. Axe; 3, R. P. Adams; 2 and 3, V. B. Hunt; 4, G. J. Axe. Xbn: 1, W. Rundle; 2, J. Jennings; 3, J. Nubben; 4, D. Edlstein. Xoi: 1, D. Kenwood; 2, P. Cooke; 3, R. F. Adams; 4, D. J. Kerr. Xr: 1, A. G. Wing; 2, R. P. Adams; 3, D. Kenwood; 4, C. Finnis. Xuy: 1, F. Orme; 2, 3 and 4, W. West. Z: 1, 2 and 3, J. Jeffrey; 4, J. Jackson. Fam: 1, J. Jennings; 2, D. Rigiani; 3, J. Hoare; 4, S. Pitcher.

THE Llanwit Major A.S. recently held their annual general meeting. Newly elected officials: chairman, B. Martin, vice-chairman, J. Thomson; secretary/PRO, L. W. G. Andrews, S. Shackleton Close, St. Athan, Barry, S. Glamorgan CF6 9JE; treasurer, A. Ellman; show secretary, J. Edwards, Llanblethian, Glam Afon, Mill Park, Cowbridge, S. Glamorgan; assistant show secretary, K. Hall; librarian, G. Lewis.

The Society meets every second Tuesday of each month at the Leisure Centre, Hamm Lane, Llanwit Major. New members and visitors are always welcome.

THAT the word *Fungus* is used to describe a wide variety of pathological conditions among fish was revealed during a discussion on this condition at a meeting of Bristol A.S.

A remarkable entry of Comets was a feature of the evening's Table Show. Results—Lionheads: 1 and 2, R. Pincock; 3, W. Gadd; 4, S. Lloyd. Postals: 1 and 2, W. Ham.

Comets: 1, 2 and 4, P. Norman; 3, H. C. B. Thomas. Catfish: 1, H. Morgan; 2, G. Price. Loaches: 1, G. Price. Barbs: 1, 3 and 4, H. Morgan; 2, G. Price.

ON 24th June the British Koi-Keepers' Society held their first auction of Koi at the Botanical Gardens in Birmingham. The best six Koi were awarded rosettes. Visitors came from all over the country to join in the friendly but competitive bidding. All eighty lots of Koi were sold.

THE second quarter of the Portsmouth A.S.'s programme for the year began with a F.B.A.S. tape-slide lecture entitled "British Native Fishes" by Mr. R. Eason. This was followed the next meeting by an evening devoted entirely to a friendly "clash" with members of the Isle of Wight A.S., involving a quiz prepared and conducted by Vernon Hunt, ably assisted by Jack Stillwell, and a table show for anabantids, danios and white cloud mountain minnows. The judge was Mr. G. Edwards of Bournemouth. Results—Siamese Fighters: 1, 2 and 3, E. Binstead (Portsmouth). Dwarf Gouramis: 1, K. Pike (Portsmouth); 2, G. Knight (Portsmouth). A.O.S. Labyrinths: 1, D. Marshall (I.O.W.); 2, T. Whitchee (Portsmouth); 3, O. Morey (Portsmouth); 4, D. Forse (Portsmouth). Danios: 1 and 3, D. McHugh (I.O.W.); 3, E. Binstead (Portsmouth). White Cloud M.M.: 1, D. Forse (Portsmouth). Best Fish in Show: Moonlight Gourami owned by D. Marshall. Overall match result: Portsmouth 29 points, Isle of Wight 10. Portsmouth won the quiz after close, fiercely fought and humorous contest.

Mr. Cyril Brown of London was guest speaker at the first meeting in May. He gave an excellent lecture on corydoras catfish which he illustrated with slides.

The next meeting saw the reappearance of Mr. Mervyn Strange of Basingstoke, who this time gave a slide lecture on "A.O.S. livebearers." There was also a table show for characins and cichlids, which was judged by Mr. N. Davis of Havant. Results: Characins: 1 and 4, M. Edwards; 2 and 3, D. Forse. Dwarf Cichlids: 1 and 2, M. Edwards. A.O.S. Cichlids: 1, Mrs. J. Pike; 2 and 4, K. Pike; 3, D. Forse. There was another table show in June; this time for barbs, rasboras and plants. The judge was Jack Stillwell. Results: Barbs: 1 and 2, D. Forse; 3 and 4, E. Binstead. Rasboras: 1, D. Forse. Rooted Plants: 1, Miss W. Ryder. Floating Plants: 1, E. Binstead. Best Fish in Show: Clown Barb owned by D. Forse.

THIRD Yorkshire Koi Festival organised by the Yorkshire Koi Society. The Festival will be held in the grounds of Harewood House on Bank Holiday Monday, 27th August 1979. The Festival incorporates our 3rd National Open Koi Show.

Last year's successful Koi Festival, held at the same venue and time, proved to be very popular with the 10,000 plus visitors. Traders who attended then have therefore already reserved additional space for this year. The event will again be advertised on Yorkshire T.V. and in the local press.

Trading space can be booked for either inside or outside the marquee at a cost of £1.60 per running foot (depth 10 feet). Please note that the minimum footage bookable is 10 feet and thereafter in multiples of 5 feet. Air will be supplied free but electricity points will be charged at £1 per point. Stands may be erected after mid-day on Saturday 25th August and the marquee will be open for trading on the day of the event from 10 a.m. to 6 p.m.

The Show Secretary is Mr. S. E. Bent, 20 Oakwood Road East, Rotherham S60 3ER, South Yorks. Telephone Rotherham 72671.

THE sixth annual open show of the Nailsea and District A.S. was held on 7th July at Clevedon Community Centre. There were 411 entries from twenty clubs; these included entries from Port Talbot in South Wales and from Birmingham. Entries from Germany were sent in insulated boxes. The prizes were presented by Councillor Coppack, Chairman of the Clevedon Council.

Results: Guppies (Male): 1 and 4, F. May (Newbury); 2, F. Drewett (Hounslow); 3, E. Drewett (Hounslow). Guppies (Female): 1, E. Jones (Port Talbot); 2 and 3, M. J. Ellick (Nailsea); 4, Mrs. Bebb (Bournemouth). Plaies: 1 and 2, D. Kenwood (Nailsea); 3, J. Hockway (Taunton); 4, E. Jones (Port Talbot). Swordtails: 1, Mrs. Bebb (Bournemouth); 2, C. M. & V. J. Howe (Newbury); 3, R. Price (Newbury); 4, F. May (Newbury). Molies: 1 and 2, Mrs. Bebb (Bournemouth); 3, D. Windsor (Taunton); 4, R. Canning (Newbury). Alfaro Crenetodon *Jenynsia Paripella Guerinatus*: 1 and 3, I. Dibble (Nailsea); 2 and 4, Hans-Dieter Georg (Germany). Neoheterandria / Carlsbubbia / Gambusia / Phallichthys: 1, 2 and 3, I. Dibble (Nailsea); 4, J. P. Parsons (Malvern). Phallocoerus / Pencilia / Pencilopsis / Niphophorus: 1, D. Kenwood (Nailsea); 2, J. Mayle (S.L.A.G.); 3, P. C. Martin (Basingstoke); 4, I. Dibble (Nailsea). Goodeidae (Ameca / Goodea / Limnognathus / Xenotoca): 1 and 4, I. Dibble (Nailsea); 2, Mrs. Bebb (Bournemouth); 3, D. Kenwood (Nailsea). Belontiina Hemirhamphidae / Heterandria/Brachycephalus and A.O.V. Species: 1, I. Dibble (Nailsea); 2 and 4, C. M. & V. J. Howe (Newbury); 3, M. Strange (Basingstoke). Barbs (Barbodes): 1, R. Canning (Newbury); 2, F. Cripps (Newbury); 3, P. May (Newbury). Barbs (Capeots and Puntius): 1, A. Chaplin (Basingstoke); 2, P. Cripps (Newbury); 3, Mrs. Bebb (Bournemouth); 4, G. Emptage (Cheltenham). Hemigrammus and Hypheosbrycon: 1, A. Chaplin (Basingstoke); 2, Mrs. Bebb (Bournemouth); 3, R. Bond (Yeovil); 4, J. Mayle (S.L.A.G.). A.O.V. Characins: 1, P. Fitchett (Nailsea); 2, A. Chaplin (Basingstoke); 3, D. Kenwood (Nailsea); 4, I. Upson (Nailsea). Siamese Fighters: 1, R. Price (Newbury); 2, A. P. Parsons (Malvern); 3, M. J. Ellick (Nailsea); 4, A. May (Reading). A.O.V. Anabantid: 1, A. Chaplin (Basingstoke); 2, L. Gale (Newbury); 3, Mrs. P. Cripps (Newbury); 4, M. Twinberrow (Malvern). Catfish (Corydoras and Brochis): 1 and 4, E. Drewett (Hounslow); 2, Mrs. S. Larkin (Reading); 3, R. Canning (Newbury). A.O.V. Catfish: 1, D. Kenwood (Nailsea); 2, E. Drewett (Hounslow); 3, R. Canning (Newbury); 4, L. Perks (Malvern). Bonas and True Loaches: 1, A. Chaplin (Basingstoke); 2, R. Canning (Newbury); 3, R. Bond (Yeovil); 4, M. J. Ellick (Nailsea). Rasboras: 1, Mrs. Bebb (Bournemouth); 2, S. A. Sanders (Malvern). Danios and Minnows: 1 and 3, Mrs. Bebb (Bournemouth); 2, M. Twinberrow (Malvern); 4, V. Legge. Labras and Sharks: 1, A. P. Parsons (Malvern); 2, P. M. Parsons (Malvern); 3, Mrs. I. Gale (Newbury); 4, P. Fitchett (Nailsea). Dwarf Cichlids: 1, P. Fitchett (Nailsea); 2, P. Dyer (Newbury); 3, L. Gale (Newbury); 4, A. P. Parsons (Malvern). Angels and Discus: 1, A. Chaplin (Basingstoke); 2, Mrs. S. Larkin (Reading); 3, Mrs. I. Gale (Newbury); 4, Mrs. M. Brown (North Wilts). Rift Valley Cichlids: 1, R. Canning (Newbury); 2, S. Dyer (Newbury); 3 and 4, L. Gale (Newbury). A.O.V. Cichlids: 1, F. May (Newbury); 2, A. May (Newbury); 3, R. Canning (Newbury); 4, L. Gale (Newbury). Toothcarps: 1, 3 and 4, R. Prior (Newbury); 2, F. Cripps (Newbury). A. V. Pairs (Livebearers): 1, 2 and 4, I. Dibble (Nailsea); 3, A. P. Parsons (Malvern). A.V. Pairs (Egg-layers): 1 and 3, R. T. Stallwood (Newbury); 2, Mrs. M. Brown (North Wilts); 4, A. Chaplin (Basingstoke). Breeders (Livebearers): 1, 3 and 4, I. Dibble (Nailsea); 2, D. Kenwood (Nailsea). Breeders (Egg-layers): 1, P. S. Parsons (Malvern); 2 and 3, C. M. & V. J. Howe (Newbury); 4, J. Mayle (S.L.A.G.). A.V. Fish—Juniors: 1 and 4, P. S. Parsons (Malvern); 2, S. Howe (Newbury); 3, S. Gale (Bournemouth). Shubunkins: 1 and 2, V. Cole (Bristol); 3 and 4, D. S. Langdon

(Yeovil). Single Tail Goldfish: 1 and 4, P. S. Parsons (Malvern); 2, G. Emptage (Cheltenham); 3, J. Day (Bristol). Twin Tail Goldfish (with Dorsal): 1, 3 and 4, J. Day (Bristol); 2, W. Gade (Bristol). A.V. Pond and River Fish: 1, 2, 3 and 4, S. Dyer (Newbury). A.O.V. Tropical Freshwater Fish: 1, R. Canning (Newbury); 2, Mrs. Bebb (Bournemouth); 3, L. Perks (Malvern); 4, Mrs. S. Sanders (Malvern). Breeders (Goldwater): 1, 2, 3 and 4, V. Cole (Bristol).

Best Fish in Show: I. Dibble (Nailsea) *Brachygraphis raddophora*. Highest Pointed Individual: Mrs. Bebb (Bournemouth). Highest Pointed Visiting Club: Newbury and District A.S. Highest Pointed Nailsea Club Member: I. Dibble. Top Tank Awards: I, I. Dibble, *Brachygraphis raddophora*; 2, S. Dyer, Booterling; 3, J. Day, Ords.

RESULTS of the 8th annual open show of the Fancy Guppy Association, North West Lancashire/Manchester Section.

Class A, Delta: 1, J. Hesketh; 2, J. C. Hutchings; 3 and 4, A. Manser. L.D.V.: 1, J. Hesketh; 2, H. Baldwin; 3, R. Wheatley; 4, R. Jones. S.D.V.: 1, H. Baldwin (Silver Award); 2, A. Rawlinson; 3, J. Hesketh; 4, P. Sarginson. Topwood: 1 and 4, P. Jinks; 2 and 3, J. Lester. Bottomwood: 1, 2 and 3, K. Lindl. Doublewood: 1, A. Manser; 2, 3 and 4, M. Kahrer. Colour Male: 1, P. Sarginson. Pintail: 1, 2 and 3, P. Jinks; 4, R. Jones. Cofer male: 1, J. C. Hutchings; 2 and 3, P. Jinks. Dove-tail: 1, K. Edge. Roundtail Male: 1, W. Hodgson. Lyretail: 1, B. Morris; 2, J. C. Hutchings. Superba: 1, P. Sarginson; 2, J. Lester; 3, R. Jones. Wedge: 1, R. Jones. Natural: 1, R. Jones (Silver Award); 2, B. Morris (Silver Award); 3, J. C. Hutchings (Silver Award); 4, A. Rawlinson. Cofer Female: 1, J. C. Hutchings. Metropollin: 1, A. Manser. Breeders (Male): 1 and 2, A. Chrison (Gold Awards); 3, R. Jones (Silver Award); 4, J. C. Hutchings (Silver Award). Breeders (Female): 1, R. Jones (Gold Award); 2, K. Edge (Silver Award); 3, A. Manser. Breeders (Pairs): 1 and 2, R. Jones (Silver Awards); 3, J. C. Hutchings; 4, R. Jones. Junior (Male): 1, Miss K. L. Morris; 2 and 3, Master S. McCullough. Junior (Female): 1, Miss K. L. Morris. Class LM: Mrs. F. Morris. Class LE: Ladies (Female): Mrs. F. Morris.

Best Male: J. C. Hutchings, Cofer Male. Best Female: R. Jones, Natural (also Best Fish in Show). Best Breeder: A. Charlton, Breeders Males. Best North West Section Member: A. Charlton with Breeders team. Best Junior: Miss K. L. Morris, Junior Female. Best Ladies: Mrs. F. Morris, Ladies Male.

It was a very successful show for most of the entrants, but in particular for Mr. Ron Jones who had travelled up from Birmingham to Preston to win the trophy for the second year in succession.

THE Newcastle Guppy and Livebearer Society and the Tyne Wear section of the Fancy Guppy Association will be holding a joint 'International' All Livebearer Open Show on 7th October at St. Gabriel's Church Hall, Chillingham Road, Heaton, Newcastle upon Tyne. Schedules will be available shortly from 'Halfbeak House', 146, Chillingham Road, Heaton, Newcastle upon Tyne NE6 5BU.

THERE were 496 entries in the **Sherwood A.S. Open Show**. Winner of *Astron* Gold Pin, Y.A.A.S. Gold Pin, also Best Fish in Show: Timof Barb, Mrs. and Mrs. Kemp (Sheaf Valley). Other results: Section A—Guppies: 1, B. Banks (BBC, Thorn); 2, D. Barrett (BBC, Thorn); 3, Mr. and Mrs. Goacher (Goole). Flashes: 1, Mr. and Mrs. Goacher (Goole); 2, M. N. Hancock (Hallcroft); 3, Mr. and Mrs. Lee (Chesterfield). Mollies: 1, Mr. D. Parrish (Sherwood);

2, 3 and 4, Mr. and Mrs. Stephenson (Workop). Sweettails: 1, Mrs. Blades (Fishkeepers); 2, J. Sutcliffe (Sherwood); 3, M. Harrison (Swillington). A.O.V. Livebearers: 1, 3 and 4, T. and P. Busfield (Barnsley); 2, Mrs. D. Cruickshank (Q.O.M.). Section Winner: T. and P. Busfield. Section B—Small Anabantids: 1, R. and S. Cherryholme (Barnsley); 2 and 3, A. and S. Smith (Zenith). Large Anabantids: 1, B. Wyatt (Sherwood); 2, R. Fisher (Sherwood); 3, Mr. and Mrs. Copley (Doncaster). Fighters (True Strains): 1 and 2, Mrs. Gray (Ind.); 3, Mr. and Mrs. Wainwright (Fishkeepers). Fighters (Multi-Colours): 1, 2 and 3, Mrs. Gray (Ind.). Section Winner: Mrs. Gray. Section C—Small Characins: 1, R. and S. Cherryholme (Barnsley); 2, Mr. and Mrs. Lake (S. Humber-side); 3, Mr. and Mrs. Hooley (Fishkeepers). Large Characins: 1, B. Sleight (Mexboro); 2, T. A. Cruickshank (Q.O.M.); 3, T. Reid (Fishkeepers). Section Winner: B. Sleight. Section D—Rasboras: 1, K. Davies (Darfield); 2, Mr. and Mrs. Lake (S. Humber-side); 3, A. Simson (Barnsley). Danios: 1, Master M. Lake (S. Humber-side); 2, A. Fraby (Wyke); 3, Mr. Rennie (Loughboro). Minnows: 1, Mr. and Mrs. Lake (S. Humber-side); 2, B. Wigley (Mexboro); 3, J. Lamb (Alfreton). Section Winner: K. Davies. Section E—Toothcarp (Aphyosemon): 1, B. Sleight (Mexboro); 2 and 3, Mr. and Mrs. Gover (Ind.). Toothcarp (A.O.V.): 1, B. Sleight (Mexboro); 2, Mr. and Mrs. Richardson (Scarboro); 3, Mr. and Mrs. Jarman (Darfield). Section Winner: B. Sleight. Section F—Sharks: 1, W. Clifton (Workop); 2, A. Cook (Hallcroft); 3, D. Lacey (Fishkeepers). Foxes: 1, Mr. and Mrs. Hopkinson (Darfield); 2, Mr. and Mrs. Hill (Barnsley); 3, Mr. and Mrs. Riley (Leeds P.O.). Section Winner: W. Clifton. Section G—Small Barbs: 1, Mr. and Mrs. J. Riley (Leeds P.O.); 2, A. Misples (Sherwood); 3, Mr. and Mrs. Hopkinson (Darfield). Large Barbs: 1 and 2, Mr. and Mrs. Kemp (Sheaf Valley); 3, B. Sleight (Mexboro). Section Winner: Mr. and Mrs. Kemp. Section H—Dwarf Cichlids: 1, Mrs. Gray (Ind.); 2 and 4, M. Price (Castleford); 3, S. Price (Castleford). A.O.V. Cichlids: 1, J. Marsland (Barnsley); 2, Mr. and Mrs. Wainwright (Fishkeepers); 3, Mr. and Mrs. Barlow (Sheaf Valley). Angels: 1, D. Harris (Mexboro); 2, A. and P. Barker (York and Dist.); 3, J. Marsland (Barnsley). Section Winner: Mrs. Gray. Section I—Lake Malawi (Endemic): 1, T. Reid (Fishkeepers); 2, M. Price (Castleford); 3, Mrs. Anderson (Ind.). Lake Tanganyika (Endemic): 1 and 2, K. Fisher (Sherwood); 3, M. Price (Castleford). A.O.V. African Cichlids: 1, L. Whalley (Barnsley); 2, Mrs. E. Stansfield (Sherwood); 3, A. Fraby (Wyke). Section Winner: T. Reid. Section J—Corydoras: 1 and 2, T. Cruickshank (Q.O.M.); 3, M. Price (Castleford). Botias and Loaches: 1, Mr. and Mrs. J. Riley (Leeds P.O.); 2, S. Sutton (Barnsley); 3, Mr. and Mrs. Barlow (Sheaf Valley). A.O.V. Catfish (Naked): 1, K. Fisher (Sherwood); 2, T. and P. Busfield (Barnsley); 3, Mr. and Mrs. Hill (Barnsley). A.O.V. Catfish (Armoured): 1, T. Stansfield (Sherwood); 2, Mr. and Mrs. Hancock (Hallcroft); 3, Mr. and Mrs. Hill (Barnsley). Section Winner: K. Fisher. Section K—A.V. Female Egg-layer: 1, K. Chapman (Mexboro); 2, Mr. and Mrs. Hancock (Hallcroft); 3, Mr. and Mrs. Copley (Doncaster). A.V. Female Livebearer: 1, T. and P. Busfield (Barnsley); 2, B. Banks (BBC Thorn); 3, Mr. and Mrs. Daines (Doncaster). Section Winner: T. and P. Busfield. Section L—A.O.V. Tropical (Small): 1, B. Sleight (Mexboro); 2, T. Stansfield (Sherwood); 3, T. Reid (Fishkeepers). A.O.V. Tropical (Large): 1, T. A. Tolhurst (Wyke); 2, Mr. and Mrs. Caldwell (Scunthorpe Museum). Section Winner: T. A. Tolhurst. Section M—Marines: 1, Mr. and Mrs. Caldwell (Scunthorpe Museum); 2, S. Simkins (Sherwood); 3, D. Lacey (Fishkeepers). Section N—Pairs Livebearers: 1, Mr. and Mrs. Goacher (Goole); 2, T. and P. Busfield (Barnsley); 3, J. Sutcliffe (Sherwood). Pairs Egg-layers: 1, M. Price (Castleford); 2 and 3, Mr. and Mrs. Lake (S. Humber-side). Section Winner: M. Price. Section O—Breeders (Live) (A. and B):

1, Mr. and Mrs. Hill (Barnsley); 2 and 4, Mr. and Mrs. Hooley (Fishkeepers); 3, B. Banks (BBC Thorn). Breeders (Live) (C. and D.): 1, J. Sutcliffe (Sherwood); 2 and 3, B. Banks (BBC Thorn). Section Winner: J. Sutcliffe. Section P—Breeders (Egg) (A. and B.): 1, Mrs. Anderson (Ind.); 2, B. Banks (BBC Thorn); 3, Mr. and Mrs. Shaw (Hallcroft). Breeders (Egg) (C. and D.): 1, Mr. and Mrs. Copley (Doncaster); 2, E. and L. Whalley (Barnsley); 3 and 4, B. Banks (BBC Thorn). Section Winner: Mr. and Mrs. Copley. Section Q—Juniors, Livebearers: 1 and 3, Miss A. Stansfield (Sherwood); 2, Master P. Busfield (Barnsley). Junior Egg-layer: 1, Miss J. Lee (Chesterfield); 2, Miss T. Hopkinson (Darfield); 3, Master R. Jackson (Sherwood). Section Winner: Miss J. Lee. Section R—Ladies: 1, Mrs. E. Stansfield (Sherwood); 2, Mrs. Hopkinson (Darfield); 3, Mrs. G. Cook (Hallcroft). Section S—Novice: 1, T. H. Tolhurst (Wyke); 2, K. Davies (Darfield); 3, Mrs. B. Wyatt (Sherwood). Section T—Goldfish and Comets: 1 and 3, E. J. Morton (Hall); 2, K. Chapman (Mexboro). Fancy Goldfish: 1, E. J. Morton (Hall); 2, K. Chapman (Mexboro); 3 and 4, B. Fox (Sherwood). A.O.V. Goldwater: 1, Mr. and Mrs. Snowden (York and Dist.); 2, D. Harris (Mexboro); 3, Mr. and Mrs. Riley (Leeds P.O.). Section Winner: E. J. Morton. Section U—Mini Jaws: 1 and 2, Mrs. V. Lee (Chesterfield); 3, S. Hancock (Hallcroft). Section V—Novelty Jaws: 1, 2 and 3, A. Bryan (Sherwood).

Sherwood A.S. would like to thank all the fellow aquarists for making this a successful show.

Brighton and Southern A.S. held their usual two meetings in July. Table show results: Class B: 1 and 2, M. and Mrs. Sayers; 2, 3 and 4, Carl Ramshaw. Class K: 1 and 3, Mr. and Mrs. Ramshaw; 2, Mr. and Mrs. Hills; 4, Mr. and Mrs. Jones. Class O: 1, 2 and 3, Nicky Woller. Class P: 1, Paul Seymour; 2 and 3, Sharon Smith. Special congratulations to Mr. and Mrs. Jones on taking their first Gold and to Paul Seymour on taking a first with a fish he had bred.

They also held a meeting called "Fishes the club have bred." This was very informative with members who had bred fish explaining to other members how the breeding was achieved and how the fry were raised.

Further information can be obtained from T. Ramshaw (Tel. Shoreham 62030).

AT the July meeting of the **Mid-Sussex A.S.**, members were reminded of the **Adur Bath Tub Race**, to be held on 25th August. Anyone who wishes to take part was requested to see Nevil. The monthly 50 club draw was won by Bill Slade, Les Pinney and Jim Burtles. Mr. Ron Foeder gave a talk and slide show on "Plant Life in the aquarium." The plant class of the table show was judged by Mr. Foeder and cards were awarded as follows: 1, J. Birch; 2, E. and T. Tester; 3, B. Slade. The other classes were judged by Mr. Burtles: La Botias: 1 and 2, E. and T. Tester; 3, P. Levine. La AOV Loaches: 1 and 3, L. Pinney; 2, P. Levine. Y. Marines: 1, J. Smith; 2, J. Birch; 3, P. Levine.

Meetings are held on the second Thursday of each month, at Oakley Lodge, Oakley Lane, Keymer. Secretary, Mr. J. Birch, 11a Sandrock Way, Haywards Heath (phone H. Heath 50585).

AT the recent A.G.M. of the **Folkstone and District A.S.**, the following officers were elected: chairman, N. Kemp; secretary, T. Johnson, 129 Harbour Way, Folkstone, Kent; treasurer, D. Brett; committee, S. Bowden, R. Green, K. Ham, A. Sycamore. There is also a change of venue. The club's

new meeting place is the Harvey Hotel, Dover Road, Folkestone on the second Wednesday of each month at 8 p.m.

New Forest A.S., held their July meeting at The Community Centre, Lymington, Hants. Main item was a judging of fish teach-in among the members. Each person had to give pointings to eight single fish in small tanks around the room. Later an F.B.A.S. Judge explained the procedure and pointed out people's mistakes. The Society feels that this exercise encourages members to be able to select a fish worthy of putting in the many open shows held.

Trainee F.B.A.S. Judge, Mr. D. Eddleston, from Salisbury A.S., presided over the table show—Results—A.O.S. Tropical: 1, T. Kirby-Danio; 1, R. Travers; 2, T. Kirby. Mollies: 1, R. Travers. Next meeting on 17th September, will include the colour slide lecture on Livebearers!

RESULTS of the Sandgrounders A.S. 9th annual Open Show held on 15th July at Meols Cop High School, Meols Cop Road, Southport:

Guppies: 1, A. Manser (Southport); 2, S. Tomlinson (Macclesfield); 3, Mr. and Mrs. Stevenson (Ostram). **Swordtails:** 1, M. and J. Bradshaw (Longridge); 2, B. W. Carter (St. Helens); 3, J. Doody (Darwen). **Platies:** 1 and 3, B. W. Carter (St. Helens); 2, B. and J. Durham (Longridge). **Mollies:** 1 and 3, Mr. and Mrs. Iddon (Sandgrounders); 2, C. McDonald (Merseyside). **A.O.V. Livebearer:** 1, 2 and 3, K. Thompson (Merseyside). **Small Anabantids:** 1, Mr. and Mrs. Underwood (Sandgrounders); 2, P. Deponzo (Sandgrounders); 3, Mr. and Mrs. B. Baldwin (Sandgrounders). **Large Anabantids:** 1, Mr. and Mrs. Underwood (Sandgrounders); 2, Mr. and Mrs. B. Baldwin (Sandgrounders); 3, C. Armour (Ellesmere Port). **Siamese Fighters:** 1, Mr. and Mrs. B. Baldwin (Sandgrounders); 2, Mr. and Mrs. Weaver (Leigh); 3, A. Manser (Southport). **Small Cichlids:** 1, J. Corbett (Merseyside); 2, D. G. Moseley (Blackpool); 3, M. and J. Bradshaw (Longridge). **Large Cichlids:** 1, L. Groves (Sandgrounders); 2 and 3, Mr. and Mrs. Underwood (Sandgrounders). **Rift Valley Cichlids:** 1, Mr. and Mrs. R. Iddon (Sandgrounders); 2, D. G. Moseley (Blackpool); 3, B. Wilson (Skelmersdale). **Angels:** 1, D. Garstang (Longridge); 2 and 3, L. Buckley (Bridgewater). **Small Characins:** 1 and 2, Mr. and Mrs. Underwood (Sandgrounders); 3, A. Hopwood (Darwen). **Medium Characins:** 1, L. Groves (Sandgrounders); 2, Mr. and Mrs. Underwood (Sandgrounders); 3, K. Buckley (Bridgewater). **Large Characins:** 1, Mrs. S. Underwood (Sandgrounders); 2, Mr. and Mrs. Underwood (Sandgrounders); 3, C. Armour (Ellesmere Port). **Small Barbs:** 1, P. S. A. Hopwood (Darwen); 2, Mrs. E. Winstanley (Runcorn); 3, Mr. and Mrs. Underwood (Sandgrounders). **Large Barbs:** 1, A. Mellor (Blackpool); 2, B. and J. Durham (Longridge); 3, J. Robert (Nelson). **Rasboras:** 1 and 2, Mr. and Mrs. Underwood (Sandgrounders); 3, J. Corbett (Merseyside). **Minnows:** 1, Mr. and Mrs. B. Baldwin (Sandgrounders); 2, R. L. Payne (Merseyside); 3, Mr. and Mrs. Underwood (Sandgrounders). **Danios:** 1, Mr. and Mrs. Stevenson (Ostram); 2, J. Doody (Darwen); 3, Mr. and Mrs. B. Baldwin (Sandgrounders). **Corydoras and Brochis Catfish:** 1, B. and J. Durham (Longridge); 2, Mr. and Mrs. Underwood (Sandgrounders); 3, R. Hodge (Sandgrounders). **A.O.V. Catfish:** 1, Mr. and Mrs. Underwood (Sandgrounders); 2, P. Kenyon (Sandgrounders); 3, Mr. and Mrs. B. Baldwin (Sandgrounders). **Loaches:** 1, Mr. and Mrs. Underwood (Sandgrounders); 2, E. and B. Calow (Bridgewater); 3, B. and J. Durham (Longridge). **Sharks:** 1, Mr. and Mrs. Stevenson (Ostram); 2, Mr. and Mrs. B. Baldwin (Sandgrounders); 3, D. Habbal (Sandgrounders). **Flying Foxes:** 1, Mr. and

Mrs. Stevenson (Ostram); 2, B. Newport (Runcorn); 3, E. and B. Calow (Bridgewater). **Killifish:** 1, K. Buckley (Bridgewater); 2, M. Buckley (Bridgewater); 3, J. Roberts (Nelson). **A. V. Female Fish:** 1, B. Wilson (Skelmersdale); 2, G. Lawless (Leigh); 3, D. G. Moseley (Blackpool). **Pairs Livebearers:** 1, P. Kenyon (Sandgrounders); 2, T. L. Penny (St. Helens); 3, R. A. Johnson (Hyde). **Pairs Egglayers:** 1, Mr. and Mrs. R. Iddon (Sandgrounders); 2, K. Buckley (Bridgewater); 3, Mr. and Mrs. Baldwin (Sandgrounders). **Breeders Livebearers 1-10 (Easy to breed):** 1, A. Manser (Southport); 2, G. Lawless (Leigh); 3, C. McDonald (Merseyside). **Breeders Livebearers 11-20 (Difficult to breed):** 1, Mr. and Mrs. B. Baldwin (Sandgrounders). **Breeders Egglayers 1-10 (Easy to breed):** 1, D. G. Moseley (Blackpool); 2, J. Doody (Darwen); 3, A. Mellor (Blackpool). **Breeders Egglayers 11-20 (Difficult to breed):** 1 and 2, K. Buckley (Bridgewater). **A.O.V. Tropical:** 1, P. and H. Batchelor (Loyne); 2, Mr. and Mrs. B. Baldwin (Sandgrounders); 3, L. Groves (Sandgrounders). **Common Goldfish and Comets:** 1, G. Lawless (Leigh); 2, B. Frost (Blackpool); 3, B. Newport (Runcorn). **Shubunkins:** 1, W. Dornie (Sandgrounders); 2, G. Lawless (Leigh); 3, B. Newport (Runcorn). **Lionheads:** 1, Mr. and Mrs. G. Harvey (Sandgrounders). **Fantails:** 1, M. J. Wilson (Sandgrounders); 2, B. Newport (Runcorn). **A.O.V. Coldwater Single Tail:** 1, Mr. and Mrs. Weaver (Leigh); 2, B. Frost (Blackpool); 3, T. L. Penny (St. Helens). **A.O.V. Coldwater Twin Tail:** 1, Mr. and Mrs. G. Harvey (Sandgrounders); 2 and 3, B. Hill (Blackpool). **Junior Livebearers:** 1, K. Corbett (Merseyside); 2, Miss H. Johnson (Hyde); 3, Master C. Carter (St. Helens). **Juniors Egglayers:** 1 and 3, Miss J. Baldwin (Sandgrounders); 2, P. Kenyon (Sandgrounders). **Juniors Coldwater:** 1, D. Harvey (Sandgrounders); 2, G. Lawless (Leigh); 3, Miss J. Baldwin (Sandgrounders). **Ladies (any variety):** 1 and 3, Mrs. Baldwin (Sandgrounders); 2, Mrs. Iddon (Sandgrounders). **Marines:** 1, G. Lawless (Leigh). **Furnished Mini Jax (No Fish):** 1, Mr. and Mrs. Stevenson (Ostram); 2 and 3, Mrs. M. Gollier (Strefford). **Other Award Winners—Best Fish in Show:** K. Thompson (Merseyside). **Exhibitor with most Points:** Mr. and Mrs. Underwood (Sandgrounders). **Society with most Points:** Sandgrounders. **Society with most Entries:** Sandgrounders. **Best Coldwater Fish in Show:** G. Harvey (Sandgrounders). **Lionhead.** Total number of entries: 992.

THERE were 463 entries at Scarborough and D.A.S. Open Show held on 15th July. Best in show was a Red Cheeked Barb, entered by Mr. M. Jordan of Bridlington. Other results—Guppies: 1, B. Banks (B.B.C. Thorne); 2, D. Barrett (B.B.C. Thorne); 3, J. King (Redcar). Mollies: 1, M. Buckley (Wyke); 2, G. Mortimer (Bridlington); 3, E. Ashton (Wyke). **Swordtails:** 1, M. Jordan (Bridlington); 2, M. Jordan; 3, T. Tolhurst (Wyke). **Platies:** 1, Mr. and Mrs. Daines (Doncaster); 2, L. Ward (Bridlington); 3, S. Ranson (Grimsby and Cleethorpes). **A.O.V. Live:** 1 and 2, T. and P. Bushfield (Barnsley); 3, Mr. R. Gledhill (Redcar). **Small Characins:** 1, Mr. and Mrs. Richardson (Scarborough); 2, K. Webb (Scarborough); 3, Mr. and Mrs. Lake (S. Humberside). **Large Characins:** 1 and 2, Mr. and Mrs. Illiker (Scarborough); 3, L. Ward (Bridlington). **Small Barbs:** 1, J. Simmonite (Doncaster); 2, Mr. and Mrs. Kemp (Sheaf Valley); 3, Mr. and Mrs. Daines (Doncaster). **Large Barbs:** 1, M. Jordan (Brid); 2, Mr. and Mrs. Kemp (Sheaf Valley); 3, F. Burrows (Hull). **Ras. Dan. Min:** 1 and 2, Mr. and Mrs. Lake (S. Humberside); 3, L. Duncan (Hull). **E.L.T.C. Top and Switch:** 1, R. Ranson (Grimsby and Cleethorpes); 2 and 3, Mr. and Mrs. Tindall (York). **E.L.T.C. Bottom:** 1, R. Brown (Moorley); 2, J. Britten (Moorley); 3, J. English (Throckley). **Angels:** 1, Mr. and Mrs. Drury (S. Humberside); 2, Mr. and Mrs. Hill (Barnsley); 3, Mr. and Mrs. D. Willey (No Society). **Dwarf Cichlids:** 1, S. Gray (No Society);

2, G. Mortimer (Brid); 3, R. Gledhill (Redcar). **Large Cichlid:** 1, J. Coxborn (Brid); 2, Mr. and Mrs. Barlow (Sheaf Valley); 3, F. Burrows. **Rift Valley Cichlid:** 1, A. Rowley (Scarborough); 2, Mr. and Mrs. Bolton (York); 3, J. King (Redcar). **Anabantids Small:** 1, J. King (Redcar); 2, J. Britten (Moorley); 3, Mr. Dearing (York). **Anabantid Large:** 1, Pete and Sylvia (Brid); 2, Mr. and Mrs. Richardson (Scarborough); 3, K. Webb (Scarborough). **Fighters:** 1, Mrs. Gray (No Society); 2 and 3, Mr. Harrison (Swillington). **Corydoras and Brochis:** 1, Mr. Hawdon (Grimsby and Cleethorpes); 2, T. Smith (Brid); 3, Mr. and Mrs. D. Forbes (Whitby). **A.O.V. Cat:** 1, D. Gregory (Scarborough); 2, K. Brice (Wyke); 3, Mr. and Mrs. Hill (Barnsley). **Loaches and Botias:** 1, Mr. and Mrs. Barlow (Sheaf Valley); 2, S. Oxberrow (S. Humberside); 3, Mr. and Mrs. Barlow. **Sharks and Foxes:** 1, Mr. and Mrs. Drury (S. Humberside); 2, Mr. and Mrs. J. Illiker (Scarborough); 3, Mr. and Mrs. R. Stone (Scarborough). **A.O.V. Tropical:** 1, Mr. and Mrs. Kemp (Sheaf Valley); 2, T. Tolhurst (Wyke); 3, B. Allen (Wyke). **Breeders Live A. and B:** 1, T. Smith (Brid); 2, B. Banks (B.B.C. Thorne); 3, Mr. and Mrs. Hill (Barnsley). **Breeders Live C. and D:** 1, T. and P. Bushfield (Barnsley); 2, B. Banks; 3, Mr. Mrs. Barlow. **Breeders Egg A. and B:** 1, B. Banks (B.B.C. Thorne); 2, Mr. and Mrs. Waller (Chesterfield); 3, Mr. Anderson (No Society). **Breeders Egg C. and D:** 1, B. Banks; 2, Mr. and Mrs. Copley (Doncaster); 3, B. Banks. **Pairs Live 1 and 2:** T. and P. Bushfield; 3, R. Gledhill (Redcar). **Pairs Egg 1 and 2:** Mr. Mrs. Lake (S. Humberside); 3, W. Sowersby (Scarborough). **Common Gold Fish and Comets:** 1, J. and J. Morton (Hull); 2, Mr. and Mrs. Waller (Chesterfield); 3, A. D. Fisher (Bradford). **A.O.V. Coldwater:** 1, Mr. and Mrs. Snowdon (York); 2, Mr. and Mrs. Tindall (York); 3, P. Jordan (Brid). **Pancy Goldfish:** 1, B. and J. Morton (Hull); 2, Mr. and Mrs. Haigh (Huddersfield); 3, K. Truelove (Brid). **Junior A.V.:** 1, Miss Canning (York); 2, Miss H. Brown (Moorley); 3, Master P. Bushfield (Barnsley). **Female Igg:** 1, Mr. and Mrs. Daines (Doncaster); 2, A. Frisby (Wyke); 3, Mr. and Mrs. Copley (Doncaster). **Female Live:** 1, J. English (Throckley); 2 and 3, T. and P. Bushfield (Barnsley).

THE Wycombe Marsh A.S. now meet at the Social Club, Radco Ltd., Loudwater, High Wycombe at 8.30 p.m. on alternate Mondays.

Recently they had Dr. David Ford on the Birth of Aquarism, Mervyn Strange on A.O.S. Livebearers, Ian Sainthome (BKA) on Killifish, Dave Sands on Corydoras and Eric Locke on Fish Photography. Further details can be obtained from the Secretary, Mike Fox, 24 Kelvin Close, High Wycombe, Bucks. (Tel. HW 38823).

Evesham Fishkeepers' Society's July meeting saw a very welcome return visit of Martin Harvey and Arthur Jarvis, who answered member's queries ranging from fish house insulation to the relative necessity of aquarium thermometers. They judged the table show which featured A. V. Characins. Results: 1, S. Biddle; 2, Mrs. E. Thornson; 3 and 4, Mrs. J. Hessel.

The Society meets on the first Wednesday of every month at 8.00 p.m. at the Hampton Scout Hut, Perthore Road, Evesham, Worcs. Secretary: M. Barnett 14 Meadow Road, South Littleton, Nr. Evesham, Worcs. (Tel. Evesham 830034).

THE open show of the **Middlesbrough and District A.S.** is to be held at James Finnegan Hall, Eston. All trophies to be returned to the Secretary, Mr. S. Cook, 19 Gerner Street, Middlesbrough, Cleveland TS56AU, by the end of August.

CHANGE OF OFFICERS

New secretary of the Taunton & District A.S. is Mr. Mark Paul, 61 Cheddon Road, Taunton, Somerset. Vice-chairman, Mrs. Cooper; Show manager assistant, Mr. F. Pickett.

The following are to be the office bearers of Paisley & District A.S. for the next two years: president, Hugh Cameron; secretary, John Thomson, 18 Castle Street, Paisley PA1 2JP, Strathclyde. (Tel. 041 840 1380); treasurer, Donald McKay; show manager, Russell Moore; shop manager, Tom Currie.

New Secretary of Caer Urfu A.S.: Mr. A. Spencer, 47 Sandrigg Square, Harton Moor Estate, South Shields, Tyne and Wear NE34 0HJ.

Alan Chapman, president of Southend Leigh and District A.S., having moved from the district, is succeeded by David Cheswright, with Derek Durrant as vice-president.

A NEW SOCIETY

An aquarium Society has been formed in Cardiff with the name of Cardiff Corporation Transport Tropical Fish Society (C.C.T.T.F.S.). Meetings are held on the first and third Monday of every month in the Transport Club, Millicent Street, Cardiff. Anyone interested please contact, A. J. Cummings, 12 Macdonald Close, Bly, Cardiff CF5 4PA.

AN APPEAL

Would any person who won a section winners trophy at David Browns A.S. open show last year, please contact Mr. H. Morrison, 18 Lower Oldfield, Honley, Huddersfield or ring Huddersfield 663401.

CALENDAR

2nd September: Castleford A.S. open show at The Civic Centre, Ferrybridge Road, Castleford. Schedules from Secretary B. Stanhill, 4 Milnes Grove, Airedale, Castleford WF10 3LZ. (Phone: 559615).

7th September: Scunthorpe & District A.S. mini show at the Brown Cow Hotel, High Street, Ashby, Nr. Scunthorpe. Benching 7.30-8.00 p.m. Also bring and buy sale.

8th September: Bristol A.S. jubilee open coldwater show at St. Ambrose Church Hall, Stratford Road, Whitehall, Bristol 5. Schedules from Mr. W. G. Ham, 18 Imperial Road, Bristol BS14 9ED. (Tel: 0272-776924).

8th September: Bethnal Green A.S. open show at Bethnal Green Institute, 229 Bethnal Green Road, London E.2. (Re-arranged date).

8th September: Kingston & District A.S. open show at Raynes Park Methodist Church Hall, S.W.20. Details from E. Lough (01-390 4138).

9th September: David Brown A.S. open show at David Brown Tractors Sports and Social Club, Meltham Hall, Huddersfield Road, Meltham. Details from Mr. Les Hardy, 19 Fairies Cottages, Taylor Hill, Huddersfield (Tel: Huddersfield 663401).

9th September: Evesham Fishkeepers Society 2nd open show at Evesham High School, Four Pools Road, Evesham, Worcs. Schedules later from E. M. Thornton, 41 Crooks Lane, Studley, Warks (Phone: Studley 7125).

8th September: Huddersfield Tropical Fish Society open show at Slithwaite Civic Hall.

Show secretary, Mr. D. Hill, 30 Celandine Avenue, Salendine Nook, Huddersfield (Tel: Hudds. 659977).

9th September: Nova's Tropical Fish Club open show at Heaton School, Newton Road, Byker, N.C. Further details from Mr. P. Caddle, 47 South Street, Deckham, Gateshead, NE8 2BD.

9th September: Wellingborough and District A.S. show at the Victoria School, Mill Road, Wellingborough. Show Secretary Mick Coe, 20 Salisbury Street, Kettering.

8th September: Bridgewater A.S. annual open show at St. George's Community Centre, Kenyon Way, Little Hulton, Manchester. Details from Show Secretary, M. Burgoyne, 15 Panty Road, Farnworth, Bolton, Lancs.

8th September: Coventry Pool and Aquarium Society open show at St. Christophers School, Allesley, Coventry. Details from Show Secretary, R. A. Claws, 46 Lynton Road, Warwick. (Tel: Warwick 498238).

8th September: Middlesbrough A.S. open show.

9th September: Zenith A.S. (Scunthorpe) open show at Charter Hall, Scunthorpe. Judging to Y.A.A.S. standards and rules. Benching 12.2 p.m. Schedules from T. Robinson, 87 Shipton Road, Scunthorpe DN16 3HJ (Tel: Scun. 585460).

9th September: Midland Aquarist League open show and inter-society show at St. Christophers Junior School, Winsford, Allesley, Coventry. Benching 12-2 p.m. Schedules from F. Underwood, 10 Hyde Road, Kenilworth CV8 2PD. (Tel: 592880).

9th September: Koi 79, The British Koi-keepers Society, Fourth National Open Koi Show, at Tatton Park, Knutsford, Cheshire Park. Open 9 a.m.-7 p.m. details: Mr. P. Waddington, 1 Avon Drive, Bury, Lancs. (Tel: 061-764 3191).

9th September: Dunfermline and District A.S. annual open show at Nethertown Institute, Dunfermline.

12th September: Ayrborough and District A.S. mini show and auction, at Greenacre Hall, Rawdon.

15th September: Plymouth A.S. open show, Trinity United Reform Church Hall, Torr Lane, Hartley, Plymouth. Schedules from Show Secretary, Mr. J. Rundle, 50 Durham Avenue, St. Jude's, Plymouth PL4 8SR.

15th September: Hounslow and District A.S. open show at Hounslow Youth Centre, Cecil Road, Hounslow, Middlesex. Schedules and run on from Show Secretary, Mr. T. Bolingbroke, 2 Holmwood Close, Addlestone, Surrey. (Weybridge 54976).

16th September: Wythenshawe & District A.S. open show.

16th September: Leamington and District A.S. open show at Trinity Hall, Trinity Street, Leamington Spa. Schedules from M. Burridge, Flat 1, 36 Warwick New Road, Leamington Spa, Warwickshire.

16th September: Barnsley Tropical Fish Society's open show.

23rd September: Chesterfield & District A.S. open show at Clay Cross Social Centre. Schedules mid-May. Details from Mr. L. Waller, 79 West Street, Eckington, nr. Sheffield (Tel: Eckington 2531 or Chesterfield 36546).

23rd September: Whitby & District A.S. open show at the Spa Pavilion, Whitby. Schedules from show secretary, Mr. D. Forbes, 12 Lockton Road, Whitby.

23rd September: Hoylake A.S. open show at the Y.M.C.A. Hoylake. Show manager, Mr. D. Laking, 82, Slingaby Drive, Upton Birkenhead (Tel: 051-677 8297).

23rd Sept: Chesterfield A.D.A.S. open show, change of venue. Now at the Chesterfield Transport Dept. Employees' Social Club, Somegraves Depot, Sheffield Road, Chesterfield. One mile north of Chesterfield on the A61. Benching 12-2 p.m. Schedules from Mr. L. Waller, 79 West Street, Eckington, Nr. Sheffield. (Tel: Eckington 2531 or Chesterfield 36546).

29th September: Ilford and District Aquarists and Pondkeepers Society annual fishkeeping exhibition at the Lambourne Rooms, Ilford Town Hall, Ilford High Street, 2-6 p.m.

30th September: Caistor and District A.S. first Open Show 1979. Caistor Town Hall. Schedules are available from R. A. Bloomfield, 10 Merlin Road, Bonbrook, Lincs.

30th September: Bexleyheath and District A.S. open show at The Crayford School, Iron Mill Lane, Crayford, Kent. Schedules from Show Secretary, N. M. Raven, 39 Mount Pleasant Road, Lewisham SE13 6RD. (Tel: 01-690 2954).

30th Sept: North Wilts A.S. open show at the Mechanics Institute. Details from Show Secretary, Mr. B. Taylor, 7 Ridgeway Road, Straton, Swindon. (Tel: 0793/82/4114).

30th September: Bexleyheath and District A.S. open show at the T.A.V.R. Centre, Watling Street, Bexleyheath, Kent. Schedules from Show Secretary, N. M. Raven, 39 Mount Pleasant Road, Lewisham SE13 6RD. (Tel: 01-690 2954).

3rd October: Rothwell A.S. First Mini Open Show at Royds School, Pennington Lane, Rothwell, Nr. Leeds. Schedules from Mr. M. Linden, 9 Mill Hill, Ponselact, Yorks. (Phone: Ponselact 704457).

5th October: Scunthorpe & District A.S. bring and buy sale at the Brown Cow Hotel, High Street, Ashby, Nr. Scunthorpe.

6th October: The British Aquarists' Study Society annual general meeting, followed, at 2 p.m. in the Meeting Rooms of the Zoological Society of London, Regents Park, N.W.1 by the Annual Conference. Membership details from the Secretary, Michael Shadrack, 61 St. Barbabas Road, Woodford Green, Essex.

6th October: Merthyr A.S. 4th open show.

7th October: Wolverhampton A.S. open show at the Oxley Community Centre, Marsh Lane, Wolverhampton. Benching 12.2 p.m.

7th October: Louth and District A.S. open show.

7th October: Newbury and District A.S. 7th open show at the Corn Exchange, Newbury. Details from Mrs. S. Canning, 6 South End, Thatcham, Berks. (Tel: Thatcham 64254).

13th October: East London Aquarists and Pondkeepers Association annual open show.

14th October: Darwen A.S. second open show at the Darwen Library Theatre. Schedules available later from Show Secretary, Mr. B. Walsh, 9 Marsh Terrace, Darwen, Lancs.

14th October: South Leeds A.S. open show at Hunslet Boys' Club, Hillside Road, Leeds 10. Benching 12 noon to 2.00 p.m. Schedules from Mr. A. Austwick, 151 Throstle Road, Middleton, Leeds LS10 4HH.

14th October: The Priory Aquarist Society are holding their annual open-show at St. Aiden Church Hall, Billy Till Lane, North Shields.

20th October: Ichiban Ranchu Society open show at St. Paul's Hall, Woodford Bridge, Essex.

20th October: The Ichiban Ranchu Society National Open Show to be held at St. Pauls Church Hall, Woodford Bridge, Essex. Schedules available from Mr. G. Lewis, 91 Bourne Avenue, Hayes, Middx. Phone: 01-573 1770. There will be seven classes, including a sales class and of course the new challenge shield entry announced earlier in this Magazine. There will be trophy and plaque awards in every class except the sales class. This is a specialist show of lionhead goldfish only.

21st October: Doncaster & District A.S. open show. Don Valley High School, Jossey Lane, Scawthorpe, Nr. Doncaster. Details from show secretary, Mr. K. Lancashire, 20 Symes Gardens, Cawley, Doncaster.

28th October: Midland Aquarist League open show and inter-society show, incorporating 1st award winners classes, at Hill Street Youth Centre, Rugby. Schedules from F. Underwood, 10 Hyde Road, Kenilworth CV8 2PD (Tel: 59280).

4th November: Halifax A.S. open show. Details later.

11th November: Bradford and District A.S. open show at Textile Hall, Westgate, Bradford. Details from Show Secretary, Mr. R. Stansfield, Station House, Leeds Road, Shipley. (Tel: Bradford 595097).

17th November: Goldfish Society of Great Britain general meeting at Conway Hall, Red Lion Square, Holborn, London.