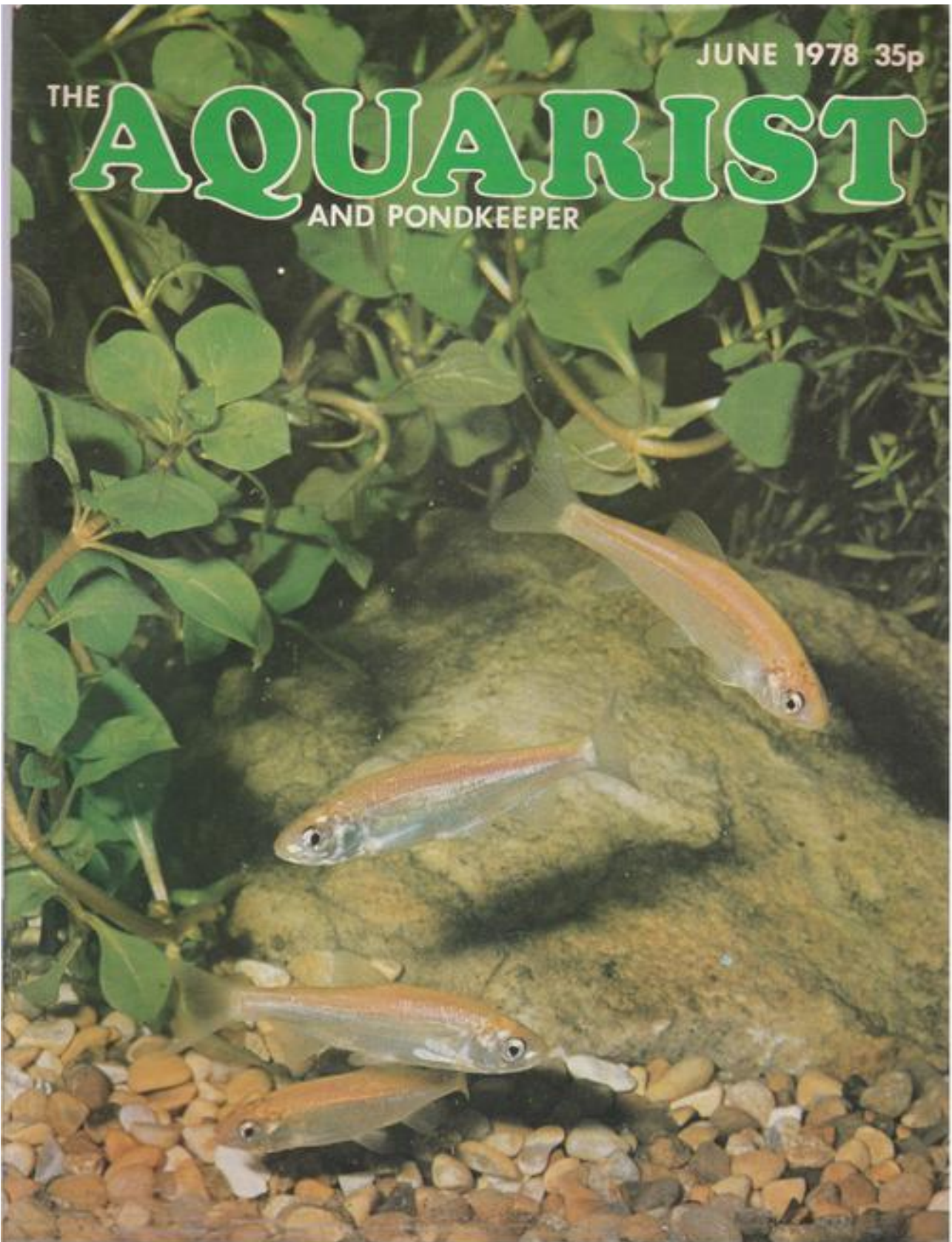


JUNE 1978 35p

THE **AQUARIST**  
AND PONDKEEPER





# THE AQUARIST

AND PONDKEEPER

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## Contents

	PAGE
The Festive Cichlid	90
Our Experts Answer: Tropical Queries	93
Coldwater Queries	96
Koi Queries	98
<i>Aplocheilichthys lineatus</i>	101
Scottish Aquarists' Festival	102
Diatomaceous Earth Filters	104
Coldwater Fish in the Aquarium	106
The Heckel Discus Fish	107
Marine Queries	115
From a Naturalist's Notebook	117
What is your Opinion?	119
Our Readers Write	124
The Water Poppy	124
Home Aquarium Competition	125
Notes from Societies	126
The Editor accepts no responsibility for views expressed by contributors.	89



## THE FESTIVE CICHLID

by Jørgen Hansen & Pamela Stewart

*Cichlasoma festivum*, which has been kept as an aquarium fish for many years, is one of the many cichlids from South America. It was introduced to Europe in 1908, although first described by Heckel in 1840 under the name *Heros festivus*. Its place of origin was then given as Rio Guapore, Matogrosso, Brazil. In 1872 it was found in the Ambyiacu river and described as *Uaris insignis*, and in 1894 described yet again as *Mesonauta festivus*; its present name was given by Regan in 1905, who stated that the species was to be found in the following rivers: Demerara, Rio Negro, Des Calvados, Carandasinho and Tocantius.

Furthermore, a cichlid by the name of *Cichlaurus festivus* (Heckel) is included in the Annotated List of Freshwater Fish of Ecuador 1967 (M. M. Ovchynnyk). As certain biologists consistently use the generic name *Cichlaurus* instead of *Cichlasoma* it is perhaps reasonable to assume that the species in question is in fact *Cichlasoma festivum*. The place of origin in Ecuador is stated by Dr. G. Orces to be Rio Lagartococha, which is a tributary of Rio Aquarico, and Rio Napo, both in the Province of Napo—Pastaza.

In British Guyana *Cichlasoma festivum* has been collected from the Cuyuni river, the Rupununi District (both Essequibo and Amazon drainages) and in the Amazon itself. *C. festivum* is one of the 3

known species of *Cichlasoma* occurring in Guyana together with *C. severum* and *C. bimaculatum* (*C. octofasciatum*).

### Description

- (1) Basic colouring whitish-grey in both sexes.
- (2) Size up to 15 cm. in both sexes.
- (3) More than 3 spiny rays in the anal fin, as in all *Cichlasoma*.
- (4) Gill rakes are short.
- (5) Mouth is small.
- (6) The pelvics are placed in front of the beginning of the dorsal fin.
- (7) The body gets deeper towards the anterior of the dorsal fin.
- (8) A black band runs from the snout to the beginning of the soft rays of the dorsal.
- (9) A black ocellus is present at the base of the uppermost dorsal fin rays.
- (10) Each scale has a darker centre.

(11)		spiny rays	soft rays
	dorsal fin	XVI	11
	anal fin	X	10

With specimens caught in nature, males are on average 1/3 larger than females, and not larger than 11 cm., while with tank-bred specimens male and female both grow to up to 15 cm. There is no clear sexual distinction before the age of two years, and



Above: Close-up of female's head  
Below: Close-up of male's head. Note how lower jaw is more strongly developed than in female

even then the sex is hard to distinguish, as body and fin form are identical in both sexes. However, the lower jaw of the male is at this age more strongly developed and coloured than that of the female. The ventral area of the female is moreover plumper, if she contains eggs.

In nature spawning occurs twice a year just before the rains, which occur from March to July and again from September to January. The fish seek shallow waters, where the eggs are preferably spawned on a more or less perpendicular surface. The spawning territory has a radius of about one metre and is defended against all other fish. Towards similar-sized fellow members of the species, the defenders retreat to a distance of about 70 cm. from the eggs.

The newly-hatched fry clump together in an area measuring 6.25 sq. cm. and which is situated about 10 cm. beneath the water surface. Brood size is stated to be 100-200, although with tank-bred fish there have been reports of broods ten times larger. When the fry are free-swimming, they form shoals of about 30 cm. in diameter, the spreading of the shoals increasing with increasing age of the fish. The caudal ocellus, which is common in American cichlids, seems to have importance with regard to orientation of the fry towards their parents.

While the parents care for the eggs, they keep the ventral fins held tightly pressed against the body, whereas when leading the fry around, they let the ventral fins hang perpendicularly in the water. Incidentally, the same pattern of behaviour is known from *Pterophyllum scalare*, of which *Cichlasoma festivum* is reminiscent in many aspects of its behaviour. Young *Cichlasoma festivum* swim around in small shoals of about twelve individuals and are often to be found together with *Pterophyllum scalare*.

Examination of the fish's stomach content reveals that *C. festivum* eats large algae (*Closterium*), crustacea (*Bosmina*), plant parts and bottom debris. *Cichlasoma festivum* serves itself as food for predatory fish such as *Cichla ocellaris* and *Hoplias malabaricus*.

We started our experiences with *Cichlasoma festivum* when we purchased four half-grown specimens, which we placed in a 130 litre's tank where innumerable hiding-places had been formed along the back and sides of the tank by means of large pieces of slate. The tank was planted with a large Amazon sword plant (*Echinodorus brevipedicellatus*) and a bunch of *Vallisneria spiralis*. The fish were especially grateful for the plants, so grateful that the many large, beautiful *Vallisneria* disappeared completely in the course of a fortnight; thereafter it was the swordplant's turn, and this was soon reduced to about 40 tattered petioles. The fish were not at all as shy as expected, and more or less ignored the set-up with the slates. However, after an incredibly warm summer or rather week, at which period of time we were of course away on holiday, the temperature in our fish room rose to 35°C, with the result that we then were left with only two *C. festivum*.

We placed the two remaining fish, at this point about two years old, in a special breeding tank which much resembled their previous tank apart from the fact that here the light was subdued by a thick layer of hornwort (*Ceratophyllum demersum*), and the tank contained fresh water with a pH value of 7 and a DH value of 14. The temperature was 28°C, and the tank was gently aerated. A large lump of coal stood near the front glass.

A week later a batch of yellowish eggs, each about 2 mm. in diameter, were to be seen on the far side of the lump of coal. The female swam slowly over the coal and released more eggs, whereafter the male glided likewise over them and fertilised them. However, in the course of two days the eggs were gone, presumably devoured.



Forty-four days later eggs were spawned on exactly the same site. Both male and female, each displaying a beautiful blueish-green pattern on the gill lid, guarded the eggs. This time we kept close watch on the fish, as we had determined to remove the eggs at the first sign of danger. However, the five minutes used to prepare the little tank normally used for artificial hatching proved decisive, as the last egg was munched up just as we were about to remove the block of coal.

A fortnight later the next spawning occurred, this time on a perpendicular sheet of slate at the back of the tank. We had otherwise turned the block of coal round and hoped that the fish would use the same site as before so that we could photograph the event, but this ruse obviously didn't fool them. We immediately moved the slate bearing the eggs across to a 12 litre



Female, with ventral fins pressed against her body, fans fresh water over eggs.

all-glass tank, gently aerated, and containing fresh water. The eggs had been laid in long rows of up to 20 eggs, with in many cases up to three rows laid on top of each other. This was something which we had not previously noticed in the approximately 25 species of cichlids we have bred throughout the years. The eggs were extremely sticky, such that if one for instance tried to detach the top egg in a row, the whole row followed.

Two days later the eggs hatched, and everything proceeded normally, but at this critical point we all left for Guernsey for a week to play chess, and the deputy fry-feeder was unsuccessful, so let's hurry on to the next spawning.

Twenty-seven days after the previous spawning, 2.11.77, over 500 eggs were spawned on the slate at the back of the tank. We put over the eggs for

artificial incubation. On the same evening about 20 eggs had already fungused, but we did not remove these because a large number of healthy eggs would also have had to be sacrificed on account of their great stickiness.

3.11.77 About 100 eggs fungused.

4.11.77 The eggs are beginning to hatch, and fall one by one to the bottom, leaving the fungused eggs on the slate.

5.11.77 The eyes are just visible.

6.11.77 The secretory gland on the head is clearly visible.

8.11.77 There are 208 fungused eggs on the slate, and 300 wriggling fry hanging at the side of the tank.

9.11.77 The fry, 5 mm. in length, are free-swimming and accept brine shrimp.

The eyes of the fry are golden in colour, and the swim-bladder shines like silver. The stomach is pink after a brine shrimp meal.

18.11.77 We have moved the young to a 130-litre tank, and feed 2-3 times daily with brine shrimp.

1.12.77 The fry are now 12 mm. in length and accept trout fodder.

*Cichlasoma festivum* is a peaceful cichlid which does not dig in the gravel, although it has a heart appetite for water plants. It otherwise accepts living food, including snails, liver, heart, lean beef and trout fodder. It quickly learns to distinguish its master and is absolutely worth a close acquaintanceship.



## 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

Will any harm be done if I use a garden or greenhouse liquid plant fertiliser in my cold-water or tropical aquariums?

A few drops of any garden plant fertiliser, invariably rich in nitrogen and phosphoric acid, will not harm the general run of coldwater or tropical fishes living in a well-planted tank. It must be mentioned, however, that the introduction of a fertiliser such as you have in mind will almost certainly result in an excessive growth of free-floating or clinging algae.

I have just purchased a catfish under the popular name of tiger shark. Can you tell me anything about it?

This fish was dealt with in page 520 of our March issue. The species is known to science as *Pangasius sutchi* and has been around, on and off, for several years.

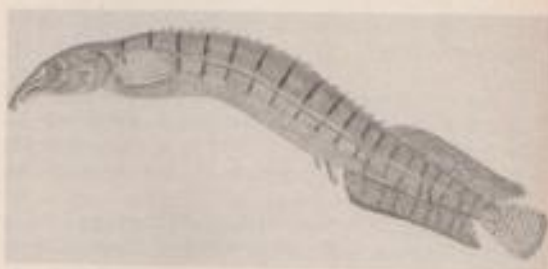
What is the difference between activated charcoal and activated carbon and what do these filtering mediums achieve?

The names are interchangeable. Specially prepared charcoal or carbon absorbs noxious gases and traps dust-fine and larger particles of swirling sediment. In brief, then, the purpose of charcoal (carbon) is to clean and purify the water. It needs to be changed about every three weeks, if not before, if the tank is well-stocked with medium-sized to larger fishes and, among them, some really gluttonous feeders.

I have been told that quite a few different species of cichlid have cross-bred and produced fertile fry. Is this correct?

It is correct. Nearly 30 years ago a female *Aequidens portalegrensis* mated with a male *Aequidens latifrons* and produced fertile fry. Since then, several cross-matings of different species of *Cichlasoma* have been recorded in various aquarium magazines.

by Jack Hems



*Mastacembelus zebrinus.*

Is the zebra spiny eel suitable for a community tank?

*Mastacembelus zebrinus*—to give the fish its proper name—is a peaceable species that tends to hide itself in thickets of plants or even under the grit on the bottom. There it will stay for protracted periods of time. It will not accept dried food or meat but must be provided with whiteworms, mosquito larvae, clean *Daphnia*, baby guppies, and the like, and these when other fishes are not swimming near to rob it of its food. Indeed, it is a good plan to drop a tight 'ball' of whiteworms into the corner or place where it is hiding every so often, particularly just before all the lights go out at night. This action will make certain that the spiny eel will not die of starvation.

How much tank space would you recommend for cichlids such as the firemouth, severum or, say, the brown acara?

If you allow about sixty square inches of surface area for each fish you can hardly go wrong.

I am a beginner who would very much like to see a vigorous growth of plants in my 53 in. by 18 in. by 12 in. tank. Would I achieve my aim if I included a couple of inches of potting compost

under the normal depth of gravel? The tank will be equipped with an under-gravel filter.

I doubt whether a u.g. filter would function satisfactorily under a layer of potting compost. I suggest that you spread a 3 in. thickness of well-washed fine grit over the filter plates and rely on the waste products of the fish to nourish the plants. Make certain that the latter are suited to growing permanently in a submerged state. Among the most satisfactory plants are *Vallisneria spiralis*, *Ceratopteris thalictroides*, *Cryptocoryne affinis* and *Hygrophila polysperma*.



*Poecilia sphenops*.

I have some female *Mollinisia sphenops* in my community tank. If I introduce pairs of *M. latipinna* and *M. velifera* will they all interbreed? The books I have are not at all informative on this matter.

The mating of two mollies of different species is quite common; so if you wish to keep a strain or breed of molly pure, then it is essential that distinct colour varieties or species are given a tank to themselves. I hasten to inform you that mollies are now referred to the genus *Poecilia*, so in future refer to the giant sailfin molly as *P. velifera* and so on.

I should like some information on the long-nosed angel fish.

The long-nosed angel fish (*Pterophyllum dumerilii*) is characterised by a longer and narrower snout than the ordinary freshwater angel fish, a pronounced black blotch under the dorsal fin, and a less voluminous anal fin than we have come to expect in fishes of the genus *Pterophyllum*. *P. dumerilii* attains a length of about 4 in. and is native to the lower Amazon and thereabouts.

I should like to know the maximum size, country of origin, preferred food and general habits of the shovelmouth catfish (*Pseudoplatystoma fasciatum*).

This species attains well over 15 in. in captivity (specimens exceeding 6 ft. have been taken in the wild), is widespread over the major part of South America, requires flesh foods and smaller fishes to eat, is more active after dark than during the daytime, appears to be a bottom frequenter and is, of course, not the fish to introduce into a small or community aquarium.

I have bought two *Otocinclus arnoldi*. What information can you give me about this species?

*O. arnoldi* is a sucker catfish that seldom exceeds a length of about 2½ in. It is peaceable and is native to La Plata. Its great virtue is that it cleans away soft algae from plants, stones and the glass sides of the aquarium. Besides its liking for algae, and substitutes for algae such as blobs of cooked spinach or lettuce, it flourishes well on a diet made up of whiteworms, shredded raw red meat and crushed flake food. It is light-shy and is most likely to be seen searching around for food in the shadier parts of the aquarium or after dark.



*Otocinclus arnoldi*.

I am a novice aquarium keeper and my tank is very green. I should very much like to know the cause of the greenness and what to do about it?

The green appearance of the water is due to the presence and rapid multiplication of free-floating algae. A slight reduction in the quality and duration of the light (illuminating the aquarium) for a week or two, followed by an increase in the number of true aquarium plants (not tropical marsh or swamp plants), then a reversion to the normal lighting conditions will usually put things right. There are chemical preparations on the market that, used exactly as directed in the manufacturer's instructions, will kill free-floating algae without harming the fish.



*Macropodus opercularis*.

After several years of coldwater aquarium keeping, I have now gone over to tropicals. I have a 36 in. by 15 in. by 12 in. tank stocked with

a mixed collection of community species and a few days' ago added a pair of paradise fish. Now I have been told by a fellow aquarist that the paradise fish will tear the other inhabitants of my tank to pieces. Is this true?

The common paradise fish (*Macropodus opercularis*), more than the albino variety, is not to be trusted with smaller fishes or with medium fishes with long or streamer-like fins. Sooner or later it will rip the fins of the long-finned species or take off the gill-covers or heads of much smaller species. Some male paradise fish can become markedly spiteful.

I wonder whether you could give me any tips about keeping *Gyrinocheilus aymonieri* alive? The specimens I have bought over the past year or two have never lived more than a few months and during this time have never appeared to have developed an appetite for worms, meat or dried food.

*G. aymonieri* lives almost exclusively on the mossy algae that coats stones, the glass sides of the aquarium or the foliage of plants. Hence a tank kept free of algae is no place for this sucker fish. Perhaps it does eat some left-overs of regular fish foods that sink to the bottom. However, there is no question that algae is the food it must have to keep it alive.

I should like to know the country of origin, scientific name, feeding and temperature requirements of the golden severum.

The golden severum is merely a colour variety of the ordinary severum or sedate cichlid (*Cichlasoma severum*). This species is native to the middle regions of the Amazon and beyond to the north-eastern corner of South America. The severum flourishes well on a mixed diet of lean meat, worms, the larger granulated

or flake food, and a temperature range of about 72°F (22°C) to 77°F (25°C).

Can you tell me how to breed *Hemigrammus umlineatus*?

Give a pair—a female in breeding condition is noticeably fuller in the body than the flatter-sided male—a tank of about 18 in. × 12 in. × 12 in. Cover the floor of this container with a carpet of well-washed grit or sharp sand and then sink weighted stems of myriophyllum or teased-out Java moss to the bottom. Use non-calcareous pieces of stone rather than lead bands to anchor the plants in place. Fix the heater in a horizontal or near horizontal position about the middle rear of the tank. This will ensure a more even distribution of heat. Maintain a temperature of about 75°F (24°C). Now feed the fish twice or thrice a day on a mixed diet of shredded red meat, gnat larvae (if obtainable in season), whiteworms, brine shrimps and similar living creatures. It is often a good plan to divide the tank into two compartments with a sheet of glass. Keep the male on one side of the glass and the female on the other. After a few days of good feeding, raise the temperature to about 78°F (26°C) and remove the glass partition last thing at night. If all goes well, it will not be long before the male starts to drive the female all over the aquarium. During the drives, eggs will be scattered among the plants. A spawning may consist of some 300 adhesive eggs. Remove the parent fish when egg-laying is completed. The eggs hatch in about 24 hours and two days later the fry should become free-swimming. Free-swimming fry require a proprietary brand of liquid fry food or freshly cultured infusoria, preferably drip-fed (siphoned) from a jar stood on top of the glass cover of the tank.

#### ADVANCE NOTICE

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Members of The Confederation of United Kingdom Aquarists  
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## GOLDWATER QUERIES by Arthur Boarder

**Could you offer some advice regarding the control of filamentous algae in my garden pond?**

Take a bamboo cane or good length of dowel rod and cut notches in one end. Use this notched end to wind the algae onto it like wool on a card or bobbin. Get as much of the algae out of the pond as you can and then plant up in late spring with water lilies (or additional water lilies) to provide considerable shade below the surface. In the shallows plant species of *Elodea* or, say, *Potamogeton* to draw on the algae-promoting nutrients in the water (provided by the waste products of the fish). With a greater spread of surface and submerged foliage algal growths will tend to tie down or very much ease the work involved in their control.

**I have two coldwater tanks both of which are equipped with under-gravel filters. About a fortnight ago, one of my air-pumps developed a mechanical fault which put the u.g. filter in one tank out of action. I transferred the fish in this tank to fresh quarters. A few days later, I noticed innumerable minute white worms gliding over the inside glass and moving about in the water. I have been advised by a fellow aquarist to empty the water away and disinfect the tank, filter and grit with a proprietary germicide followed by a thorough washing in several changes of water. Do you think all this work is necessary?**

The short answer is no. The failure of your under-gravel filter has resulted in a population explosion of planarian worms. Gently stir the top of the compost to churn up the mud and then syphon the dirty settleings on the compost away. Maintain a good light to keep the plants active and set the under-gravel filter working again as soon as possible. Then return the fish.

**I have been told that to keep goldfish successfully, I must have an air-pump and filter. Is this true?**

Not if the tank is large enough to support the fish in comfort and it is kept clean and supplied with oxygen given out by the right sort of aquatic vegetation growing under an adequate natural or artificial light. Go in for the largest tank you can accommodate and afford. A 36 in. x 15 in. x 12 in. tank will provide a suitable home for some 18 in. of fish. That is nine 2 in. fish, six 3 in. fish and so on. Feed the fish rather sparingly twice or thrice a day and use a syphon tube periodically to clear the bottom of sediment.

**I have a Bristol shubunkin and have recently noticed blood coming from the pectoral fin joint. The fish appears to be otherwise quite healthy. What shall I do please?**

It would appear that the fish has injured the joint in some way. I think that you can rule out damage by a fish louse as I do not think that one would be likely to draw blood. Your fish may be a male and it has been chasing a female fish. In such breeding actions the pectoral fins are used to knock against the female fish to encourage it to lay eggs. The wound could be dabbed with a little T.C.P. on cotton wool if it does not heal quickly.

**I intend to breed some fancy goldfish and am not sure when I should start to feed the fry?**

The fry start to feed once the food sac with which they are born is used up. The time taken for this depends on the temperature of the water. With one of about 75 F., the fry can be free swimming and feeding in twenty-four hours. At a lower temperature it can be a day or more longer. Once the fry hatch they hang on water plants etc., whilst the food sac is being used up. Once this happens the fry are free swimming and searching for food. Their first food is *infusoria* and this can be encouraged by adding a liquid fry food to the hatching tank when the eggs are placed therein. If you have a garden pond you can take some of the water out and add a little three or four times a day. It is almost certain that the pond water will contain plenty of free floating Algae and a certain amount of *infusoria*. It is a very good plan to use a microscope to examine the pond water to see that it contains plenty of food for the fry. I found a student's type microscope of about 24 magnification to be ideal for the purpose. A high magnification type does not give a good idea of the amount of life in one drop of water as the lower strength microscope.

After a few days you can add some fine, powdered fish food. You can buy this type for fry or you can crush up some good flake food. This can be sifted through a tightened silk stocking.

**I am keeping some *Daphnia* in a small pond and wish to breed them for feeding to my fishes. I would be grateful for any advice on feeding them.**

*Daphnia* feed on *infusoria* and so if you add some each day the *Daphnia* should be all right. You could throw some crushed lettuce leaves in the pond and this will encourage the formation of more *infusoria*. The danger with this method is that you could so

pollute the water that the *Daphnia* would die. Some water should be changed for fresh every few days. If you have another pond with some green Algae in it you could add some of this water to the *Daphnia* pond every day. The *Daphnia* die off in the winter but some are able to reinfest the pond in the spring.

**Why does the water in my goldfish bowl go green within a few days of it being cleaned out?**

The water turns green because of the presence of thousands of tiny single-celled plants known as Algae. This growth is encouraged by light and a bowl is the worst receptacle in which to try to keep a goldfish healthy. The bowl does not give any chance for the fish to get out of the sunlight. Also the surface area of water is insufficient for any fish of a couple of inches long. You should get a proper tank, (aquarium as some call them) and then you should shade out the ends and back with paper or aluminium foil. The tank should then have some gravel in the base in which the water plants can grow. There should be a hood over the tank with a lamp to illuminate the water and a glass cover to keep out any dust. The tank is not to be stood in the direct sunlight but against a wall at right angles to a window is better. The glass cover should not fit tightly but allow air to enter. If you have enough water plants and the lamp is not kept on too long each day, you should not have green water in the tank. Some Algae will form on the inside of the glass and this should be allowed to remain except for the front glass. This should be cleaned every week when the usual servicing is carried out. When some of the water has been removed by siphoning out the mulm from the front of the tank the inside of the glass can be cleaned with a cloth pot scourer.

**I have recently moved into a flat and am now having trouble with my fish tanks. The sides soon get covered with a chalk-like substance which falls to the bottom like powder when scraped off. What can I do to prevent it?**

It appears that the water is very hard and so it contains a lot of lime-like substance. Try keeping a small net bag of peat in the back of the tank base. This should counteract the alkalinity of the water.

**What book do you recommend on the following: pool construction; stocking with plants and fishes; diseases; life in the pond; plant diseases; breeding and types of fishes suitable?**

There are many books on the subject but I feel sure that my book, "Coldwater Fishkeeping," will suit you very well. It is a moderately priced book at £1.00 and as all unnecessary matter has been excluded it contains more useful information than many books twice the size and three times the price. The experience of very many years fishkeeping has been included and any information in it is from incidents

which have actually happened in my ponds or tanks. As I have been a successful exhibitor for fancy goldfish in the past and have judged many shows, I have been able to include much useful information for the prospective exhibitor.

**I have a pond in the garden with five goldfish. Four of them chase the other one and often the unfortunate fish breaks the surface in its efforts to escape. Why is this?**

The reason is that the fish is a female and the others chasing it are males. This is the spawning procedure when the male fish chase and nudge the female fish to encourage them to lay their eggs. There should be plenty of water plants in the pond so that the female can escape the attentions of the others if it is not yet ready to spawn. With four males it is possible for one female to be damaged and if possible remove two of the males to another pond for a time.

**I have found a lot of frog spawn in my garden pond but so far there is no sign of any tadpoles appearing. This spawn was moved to a fresh pond as the other one became too crowded with spawn. Why is this, please?**

You state that the spawn was removed to a fresh concrete pond. I have a suspicion that there was a lot of free lime from the concrete and this would kill the eggs. If this is not the reason then I can only think that the eggs were not properly fertilised.

**I have a plastic liner pool in the garden with a few small goldfish. I am going to have a solid plastic pool in the summer and wonder if I can keep the goldfish in two containers, each 18 x 12 inches?**

You must not over-stock the tanks and so you must allow 24 square inches of surface area to each inch of fish.

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## OBITUARY

It is with much sorrow and regret that we record the recent passing of Sid Cleveland of Broad Green Aquarium. In spite of failing health over a period of some years, he displayed great determination, was always reliable and seemed to possess almost limitless reserves of energy. His reputation for 'straight dealing' also gained the highest respect from all who really knew him.

Many of our readers will recall the huge pond that Sid and his wife used to erect each year for the Alexandra Palace Exhibition, often working through the night in order that it should be ready for visitors the following day.

*The Aquarist & Pondkeeper*, together with Sid's many friends extend their deepest sympathy to his wife and family.

## KOI QUERIES

by Hilda Allen

I hope to be able to make a Koi-pond in the near future and decided to buy a few small Koi in readiness and these were put in a 30 in. x 15 in. x 12 in. tank about five weeks ago. Soon after purchase it appeared they had skin-flukes as they were constantly flicking and twitching. So, I treated them with a well-known remedy. Two weeks ago I bought three more Koi and added them to the tank, as I had nowhere else. Now they are all going frantic and flicking almost non-stop. All are still in treatment, but I must do something quickly. Can you offer any advice?

Yes, do not buy any more Koi. The three recently purchased Koi, whether they were healthy or not, should never have been mixed with those that were obviously in trouble, as now all are affected by whatever disease or parasite was purchased with the original fish.

It is difficult to say if the continual flicking etc. is due to possibly skin or gill flukes after the amount of treatment given, or if the water condition is causing the restlessness. I suggest you immediately change about half the water, leaving out the treatment, in order to note the effect. You did not indicate if you had adequate aeration and/or filtration and there is a possibility that the water may be partly polluted by over-stocking. It is obvious that you are lamentably short of facilities and unable to segregate your Koi for quarantine and I do urge you not to be tempted to buy any more in your present circumstances, or you will never be out of trouble. The quarantining of imported fish is very necessary and this advice is based on past experience. Each batch must be isolated for the duration of the quarantine period which ideally should last for six months or more. There must be no new additions during that time or the whole object is defeated, in that the original fish must remain in quarantine for a longer period than necessary. Many new purchases are seriously debilitated by previous stress and their first requirement is wholesome water, rest and good feeding before any treatment is attempted. For such fish treatment may well be 'the final straw', but in any case, they should be allowed to become stronger, I feel.

This advice is intended for beginners who may not be aware of the problems which are common knowledge to more experienced fish-keepers. It is easy to be enthusiastic about Koi and enthusiasm is maintained when not too many difficulties or losses are encountered.

Perhaps you could explain your reference to "relatively bare Koi-ponds" in the April issue. I cannot understand why this should be so, surely most fish would prefer some plant life which in any case always improves a pond's appearance? As I am in the process of digging a pond, hopefully to contain Koi (and plants) I trust you will be willing to explain the pros and cons of plants in Koi-ponds.

I am in complete agreement with your views on plant-life, both for the sake of the fish and aesthetic appearance. Over the years there can be few aquatic plants that I have not introduced into my ponds. Aquatics produce some of the most beautiful flowers and surely the sight of water-lilies in bloom is unsurpassed in nature. There are varied opinions on the value or otherwise of planted Koi-ponds, including the practicalities of maintaining vigorous plant growth. My own experience has been that for many years the idyllic situation where balanced ponds with clear water certainly existed by virtue of adequate planting and relatively smaller, undemanding fish such as the goldfish family. The introduction of a few Koi (up to 10-11 inches long) rapidly changed things. The reasons were that the Koi needed greater quantities of food, with the consequent increased amount of waste to destroy the previously balanced conditions and the plants began to suffer from their activities. As the Koi grew the plants were decimated and their pond became littered with broken or uprooted plants of all descriptions and the whole effect was one of disaster. It was obvious that, despite what I wanted, keeping hungry, determined Koi and luxuriant plant life were incompatible. Koi have large, protrusible mouths, extended, they have enormous sucking power. On the pool floor they will sift through all the settled material (which is then unsettled and in suspension) and at the water surface they resemble miniature vacuum cleaners. The above are some of the reasons why many Koi-ponds can be described as "relatively-bare." There are others, relating to people's preferences, water-hygiene, filtration, etc.

If you intend to stock your new pond with small Koi you would be advised to (a) provide some plants and (b) make provision for a filter. Small Koi enjoy the cover provided by oxygenators, etc., which also harbour all forms of live food for them, and small Koi present less problems. It will be your pleasure to watch them grow and see how the plants fare. Me, I still insist on having water-lilies for both beauty and useful shade in high summer, but I must admit they survive rather than thrive in a pond full of Koi.

One or two of my Koi purchased last year appear to be in poor condition and have sore places. I have tried to treat them, but they are virtually impossible to hold whilst out of water until nearly exhausted. I am worried about causing such distress. Can you help?

Your concern for the Koi is commendable and I am pleased to advise you that fish can be either safely tranquilised or completely anaesthetised by a chemical substance known as MS-222 SANDOZ. I have immediately sent you the name and address of the supplier in Norwich but because of variations in currency exchange you will need to ascertain the present ruling price. There is a minimum order value of £10 and you will have to purchase two 10-gramme sachets or one 25-gramme sachet. At the time of writing these cost £12.15 or £13.67 respectively, inclusive of V.A.T. and currency surcharge. This may seem expensive, especially if not shared with someone else, but if stored correctly in a light-proof container it will remain effective for several years.

The dosage is quite small at 1 part MS-222 in 25,000 parts of water which is equal to 1 gramme in 25 litres or 5½ Imperial gallons, quite sufficient for your largest Koi. Dependent on the size of fish a safe tranquil state is reached in a few minutes to allow any treatment required.

When tranquilised the fish should be laid on a thick, wet cloth and the head and gills covered with another wet cloth, in particular the eyes must be kept wet or blindness may occur. The affected areas should be gently cleaned with a cotton-wool bud dipped in a 2% solution of mercurochrome or a saturated solution of malachite green, wiping away any traces of fungus. When clean, partially dab dry and apply a second coat of the disinfectant which can be covered with a smear of Friars Balsam. This dries almost immediately and will help to retain the medicant for 2-3 days before peeling off.

The Koi should be turned over and the other side similarly treated if necessary, always handle fish with wet hands. Gently return the fish to the pond and after being held for a few seconds, it will move away and swiftly recover with no ill effects from the tranquilising drug. In the case of severe damage or infected wounds caused by fish-lice or anchor worm it may be necessary to repeat the treatment.

I have used MS-222 fish anaesthetic on many occasions, either for inspection or treatment and it is the only way in which large, strong fish can be safely treated without risk of damage.

In the event of a Koi being beyond any hope of cure, it can be left to die painlessly in the anaesthetic. This is infinitely preferable to some of the callous methods of destroying sick fish I have read about.

Referring back to the first part of your letter, I would suggest your problems are from last year and introduced with new purchases. The recent winter

was very difficult for Koi, with extremes of temperature changes well into the spring, but Koi that are established and maintained on a proper diet, according to weather conditions, have survived extremely well and without trouble.

**I have a Koi that seems unable to keep upright and mostly is near the surface of the water when the others are lower. They have all been fed regularly, mainly on sprats and bread and I would appreciate your advice.**

Your Koi is suffering from swim-bladder trouble and I suggest you transfer it to shallow water which should be slowly heated to a temperature of 65°-70° F. Swim-bladder problems are often caused by over-feeding or too much fat in the diet, either of these put pressure against the swim bladder, when it cannot function properly.

A more balanced diet is advised for your Koi and should include vegetable and some live food such as earthworms. In my opinion sprats are far too oily to feed to Koi and these could be the cause of trouble, especially at low temperatures. It would be better to use shrimp, prawn or mussel as part of a mixed diet and over-feeding must always be avoided.

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## BOOK REVIEW

**Discus** by Gunter Keller. Originally published under the title *Der Diskus, König der Aquarien fische*, and now published by T.F.H. Publications Ltd., at £1.20.

Considerable mystique still surrounds the Discus fish and of all aquarium fish it continues to arouse a deal of excitement among a wide international circle of fishkeepers. A number of names are bandied with awe where Discus are discussed—Schmidt Focke, Harald Schultz and Jack Wartley, for example, and their connection with the king of aquarium fish makes interesting reading in this book.

Chapters on keeping Discus and on breeding them will be most useful to Discus keeping tyros who are becoming renowned for their hungry assimilation of all available material published on their speciality.

Colours of Discus varieties shown in published photographs never cease to amaze and those less travelled among us may die wondering about some examples of the species' diversity and brilliance of colour. Among the many colour photographs in this book are some showing Discus with gaudy and bizarre colouring as well as those more commonly seen, but a beautiful specimen photographed by Gerhard Marcuse has subtle colouring with red belly spots and has a more compelling and believable impact than the eye-jerking and quite unbelievable varieties more often seen on the printed page than in the aquarium.

# *Aplocheilichthys lineatus*

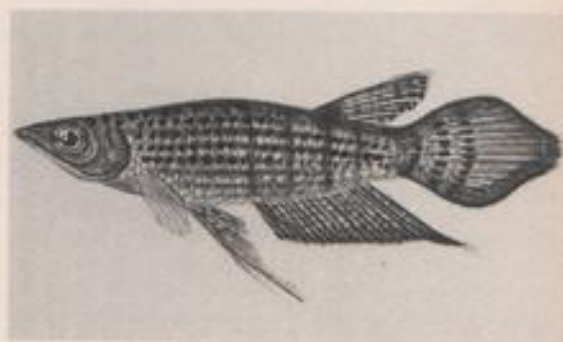
by Jack Hems

The sparkling or lined or blue or Deccan panchax, an oviparous member of the widely distributed family Cyprinodontidae, is now known to science as *Aplocheilichthys lineatus*. In times gone by—the fish made its debut in aquarium circles as long ago as 1909—it was referred to (formally) as *Panchax* or *Haplocheilichthys rubrostigma*. It is extensively found in the wild in southern India. There it reaches, as it does in captivity, a length of some 3½ to 4 in.

Perhaps the most characteristic features of this fish are the elongated body, depressed anteriorly and compressed posteriorly, a large mouth, a short-based dorsal fin set near the tail, and a marked disinclination to move about except at infrequent intervals. Indeed, it spends what seems like hours on end hardly moving at all among, or on the fringe of, tangled masses of floating plants. All the same, certain stimuli as, for example, the introduction of food, any real or imaginary cause for alarm or, say, the approach of a member of its own kind, will send it speeding through the water to pastures new.

The male is decidedly handsome. His general colour is rather variable but in the main is olivaceous brown or rusty red on the back, shading through lighter tones overlaid with glassy green to yellowish on the underparts. Rows of greenish gold dots extend from behind the shining yellow- to blue-green gill-covers to the caudal peduncle. Some barring may or may not be present on the body above the anal fin. The unpaired fins are blue to sulphur-yellow speckled and streaked with green and bordered with red. The plainer—if not darker—and plumper female exhibits six or more dark vertical bars between the pectoral region and the tail. There is a well-defined black spot in the base of the dorsal fin. Both this fin and her anal fin are rounded (those of the male are well-produced and pointed). The ventral fins are quite long and terminate in spike-like tips.

*A. lineatus* is not suitable for a community tank stocked with fishes less substantially built than itself; for it is a voracious feeder and can make short work of any species small enough to be snapped up and swallowed without difficulty. It is no danger, however, to fishes of about its own size. Always though the tropical aquarist of long standing or wide experience would agree that the best place for *A. lineatus* is in a tank with no other fishes present. An 18 in. × 12 in. × 12 in. tank will suit a pair very



well. For all that, more spacious accommodation is advisable.

Well-matured water is called for. Better still water that is soft and neutral to acid. Among the most suitable water plants are the pygmy bladder-worts (*Utricularia*), *Riccia fluitans*, and species of *Myriophyllum*, *Limnophila* or *Cabomba*. Java moss (*Vesicularia*) tied with nylon thread to small pieces of buoyant tree bark—well-soaked beforehand to clear it of excess acid—afford both spawning grounds and decoration.

Ordinarily *A. lineatus* is quite comfortable at a temperature in the lower to middle seventies (°F). For breeding, however, the temperature should be raised and maintained at about 77°F (25°C). A glass cover or hood that fits close to the top of the aquarium is of supreme importance; for the fish is an accomplished jumper and, if the opportunity presents itself, will rocket through any aperture not too small to prevent its suicidal (in most cases) exit.

Its natural food is gnat larvae, insects unfortunate enough to land on the water, fish fry and so on; but in the aquarium it is neither a specialised nor fastidious feeder and the regular livefoods, flake foods that suit flesh-eating fish, and such tit-bits as shredded lean meat, concussed houseflies, and the like, go down well.

There is nothing spectacular about its breeding habits. If conditions in the aquarium are right (temperature, quality of the water, and so on), the roe-distended female, closely attended by the male, brushes off, or sticks, adhesive eggs on the plants. Egg-laying is not completed in an hour or even half a day but is spread over a week or two. From a score

*Continued on page 105*

# SCOTTISH AQUARISTS' FESTIVAL

## 1978

WITH SCOTLAND doing so well on the soccer fields, it was hardly surprising that the 6th S.A.F. reflected a sporting aspect in some of the tableaux. In fact, Alloa gained 3rd place with **A Football Stadium** and Wester Hailes attracted a fair amount of viewers with their Scotland/Argentina footballers and World Cup effort. Still on sport, Livingston A.S. took 2nd place with a well constructed **Boxing Ring**, while 4th spot went to Muirhouse with their **Electronic Calculator**. 1st place was taken by Lanarkshire A.S. with **A Safe**, this also securely held the "Best Fish in Show." J. Nimmo taking the Bobby Wood Trophy with a very good Upside Down Catfish (*Synodontis Nigriventris*). Lanarkshire also took the

"Tetra Min" Trophy, and the new "Aquarian" Trophy for a well developed Flying Fox (*E. khallopterus*), plus the Ayrshire Jubilee Trophy—another new one.

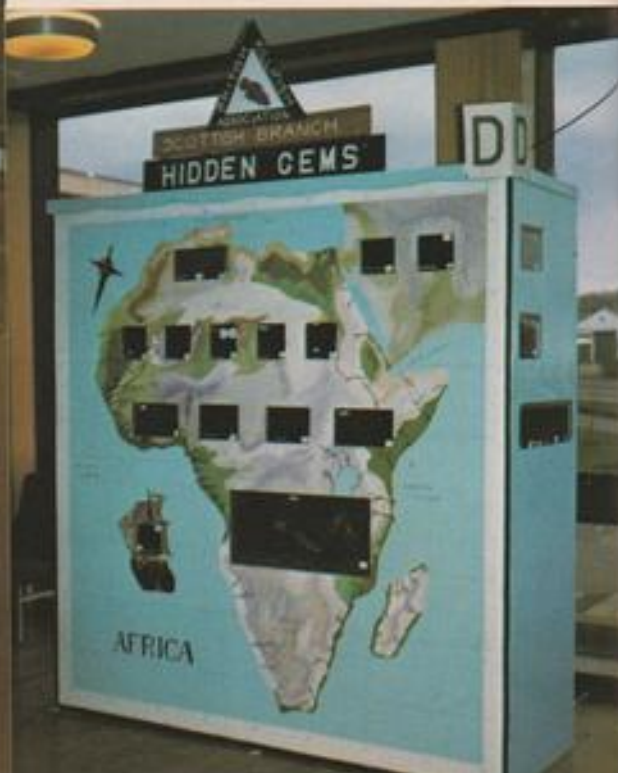
"The Aquarist" Trophy which is awarded to the Society gaining the most points went to Northumbria A.S. with their usual high standard of entries which earned them a further 5 trophies (N.E.L., Belle Vue, Rift Valley, Fotheringham and Aberdeen Trophies). Not too far behind on points came Stanley A.S. who took the Woodcock Trophy, the Alloa Trophy with a nice team of *M. Rachovi*, the M. & M. Trophy and the F.N.A.S. Trophy for the best Individual Furnished Aquarium—this was a particularly good set-up. It needed to be, as the Furnished Aquaria Section was

*Continued on page 114*

Two of the most colourful tableaux to be seen at the S.A.F. Left: 'World Cup' by Wester Hailes A.S.

Below: 'Hidden Gems' from B.K.A. (Scottish Group).

Bottom Left: A representative of Northumbria A.S. receiving 'The Aquarist' trophy for the highest number of points from Mr J. E. Young.



# DIATOMACEOUS EARTH FILTERS

by Graham D. Forkes

THIS ARTICLE, which follows "The concept of filtration," will embrace several different types of diatomaceous earth filters, which, although not used generally by aquarists, are finding increased use to the fish breeders, and trade suppliers of marine and tropical freshwater fish. Many of the points will apply to the available diatomaceous earth filters on the market.

Diatomaceous earth may be called diatomite or abbreviated to D.E. Its chemical composition is similar to that of sand, and does not react with any of the proprietary brands of chemical treatments available.

The name diatomaceous is derived from diatoms—the fossilised remains of minute aquatic plants of which it is composed. These plants grew millions of years ago and averaged less than 1/25,000 mm in size. They settled on the bottom of the ocean floor in deposits hundreds of metres thick, and were thrust up into the land areas by subsequent upheavals of the earth's crust. Microscopic examination of this white powder reveals fossil skeletons in a myriad of shapes and sizes resembling snowflakes in their variety (see sketch of various types, Fig. 1). Each tiny fossil is porous and contains minute passages and channels which can only be measured in microns, or millionths of a meter; water passes easily through these grains, but the openings are so small that certain bacteria and parasites can be filtered. Diatomaceous earth is graded by size and only the finest grade should be used for aquarium filters, the coarser grades being used on the larger types of filter used by commercial fish breeders and zoos.

The grains of D.E. filter so finely that water should not be forced through at the same rate as it is forced through charcoal, wool and sand filters; for efficient operation, the flow rate should not exceed 2½ gall. per min. for each square foot of filter surface area; a flow rate of 1 g.p.m. per square foot is often used, and is recommended for greater efficiency.

## Filter construction

There are two basic types of D.E. filters:

1. The pressure or closed system;

2. The vacuum or open tank (only used by commercial concerns, and not generally available).

Pressure D.E. filters are usually made of plastic, glass fibre or stainless steel and contain elements or grids which are closely woven screens of synthetic fibres, such as nylon or dacron, etc. These screens are usually supported by plastic frames to keep them rigid. Filter elements vary in size and shape and may be cylindrical, flat or disc shaped; rectangular, flat sheets and thin curved sheets arranged in concentric circles are also used.

The circulation system with D.E. filters may be arranged in such a manner that the water may come from the tank or aquarium, go through the filter and return to the tank, or it may be recycled through the filter, the pump, and back into the filter. During the re-cycling period the filter is completely isolated from the aquarium or tank. This system is not generally used, and requires a fairly complicated and expensive set-up. Pressure D.E. filters use a re-circulation pump ahead or before the filter tank to push the water through the elements.

## Operation of D.E. filters

To begin operation of a diatomite filter the tank or container must first be filled with water taken from the aquarium or reserve supply, never directly from the domestic water supply. An amount of D.E. powder (according to instructions, or equal to about 2 oz. for each square foot of filter element surface) is introduced into the filter tank, either through the suction line, or if the tank is open, at the top; the method of charging with D.E. varies from manufacturer to manufacturer. (It is advisable to follow the instructions given with each filter; the above is given as a guide only).

As the water passes through the filter the larger particles of D.E. are caught on the surface of the element and the smaller particles pass through. The large particles partially block the element screen so that they, in turn, will catch the smaller particles as they are recycled again and again. This process is called "pre-coating" and results in a smooth,



even layer of D.E. covering the entire surface of the filter elements to a thickness of 1 mm. This porous layer contains about 2,500,000 plus microscopic holes per square inch. The pre-coat is complete when all the diatomaceous earth has coated the entire surface of the element.

Suspended particles of dirt, etc., from the aquarium begin to clog the pores of the filter coat, causing the flow rate to decrease and the pressure within the filter to increase. This clogging process can be slowed somewhat by introducing a small amount of D.E. to the filter at regular intervals. The D.E. mixes with the dirt and keeps the layer porous as it builds up in thickness. This method of adding D.E. to the filter is called "body or slurry feeding," the rate of slurry feeding being dependent on the number of fish in the aquarium.

Other mechanical aids, such as charcoal or filter wool, are not used with D.E. filters. If the filter is

efficient they should not be needed, and if used, may impede the filter flow rate.

When the elements become clogged sufficiently to reduce the flow rate significantly, the filter must be cleaned. If the backwash system of cleaning is used, water pressures up to 30 p.s.i. may be required to remove the D.E.; in all cases the manufacturer's instructions should be strictly adhered to.

Keeping the elements clean is very important in diatomaceous filter operation. If dirty water is allowed to circulate through the filter without a coat of D.E. on the elements, they may become clogged with dirt causing harmful bacteria to build up. This inevitably results in loss of fish. D.E. will only be deposited on that part of the element through which water flows. A clogged element will not coat with D.E. properly and will therefore decrease the total effective area of the filter. The pump will continue to provide the same water flow to this diminished surface area, thereby causing an overloading of the rest of the filter. Overloading will, in turn, lead to compacting and compressing dirt into the elements, and a vicious and expensive cycle begins. For this reason it is important to read and follow carefully the manufacturer's instructions and to operate the filter only when the elements are properly coated.

In conclusion, D.E. filters provide a very efficient method of filtration. However, compared with sand or other types of filter, they require higher pump pressures to be 100% effective. Also they require more surface area of element than for example sand or wool/charcoal.

The cost of D.E. as with most of the other filter aids, is an expense not encountered with sand or U.G. type filters.

Running costs are approximately the same, but a careful choice of the size of the filter to suit the aquarium must be made. Whatever choice is made, bear in mind that it will not necessarily produce instant clear sparkling water; many water problems are caused by chemical changes and cannot be filtered out.

The filter will only work efficiently if it is properly maintained and cleaned, and instructions followed carefully.

### *Aplocheilus lineatus* continued from page 101

or two up to about 200 eggs may be deposited at a spawning. (Young females do not produce such a large number of eggs as older ones). The easily detected eggs take about ten to twelve days to hatch. The fry are ready to eat minuscule livefood such as brine shrimp or micro worms as soon as they are free-swimming. The parent fish take little or no interest in the eggs. The presence of moving fry, however, awaken cannibal instincts. Hence removal of the parent fish to another tank is called for. If this

is out of the question, fragments of the plants on which eggs have been laid should be transferred to jars for hatching. These can be floated in the parent's aquarium.

Finally, because egg-laying is spread over several days, and weeks' old fry vary a lot in size, they should be sorted every so often to prevent larger ones bullying and perhaps killing smaller ones. With proper care and attention, growth is rapid, and the young fish should reach full size before nine months are out.



# COLDWATER FISH IN THE AQUARIUM

by *Dr. Christopher Andrews*

Whether it is situated in the lounge at home or the doctor's waiting room, the aquarium is considered by many to be the realm of TROPICAL fish. However, there are many varieties of goldfish, and even some British freshwater fish, that not only do well in aquaria, but also show their true beauty under such conditions.

The small aquarium with one or two goldfish (plus a minimum of accessories) is the way in which many of today's devoted aquarists began. But what of the maintenance of a more varied selection of coldwater fish in the aquarium? The relationships that exist between size of fish, its oxygen needs and temperature, and between temperature and oxygen content of aquarium water are important.

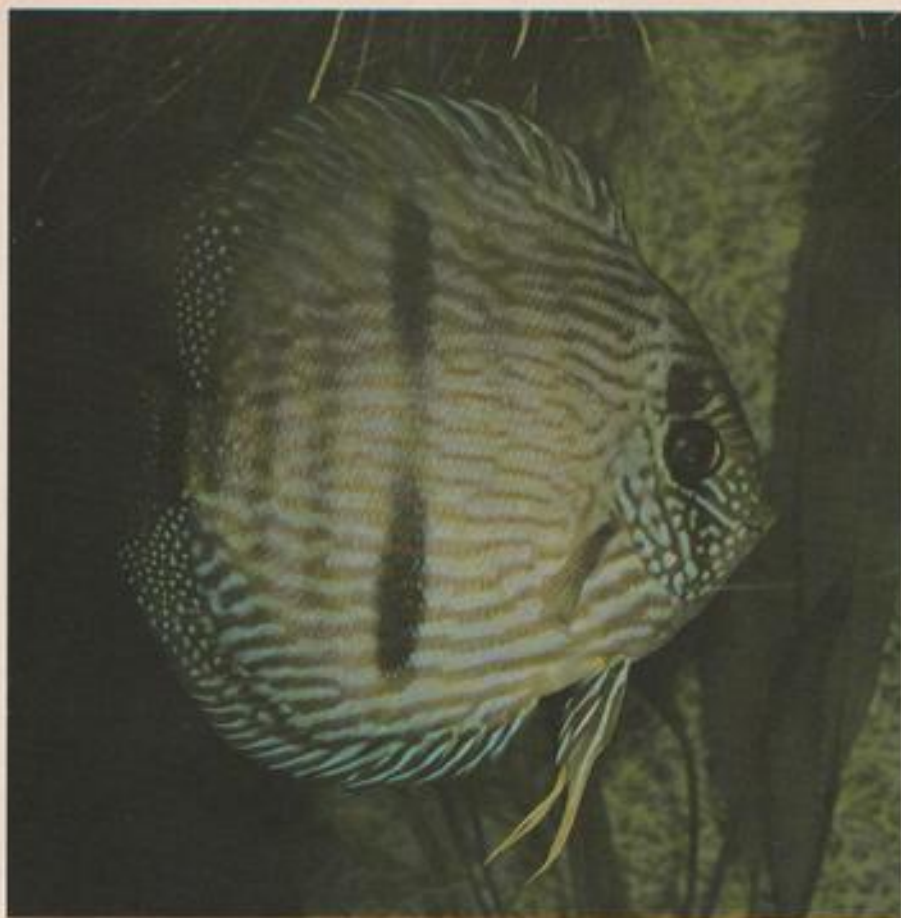
In general terms, the oxygen needs of fish increase with temperature, and it has been found that rainbow trout require more than twice as much oxygen after a 10°C rise in temperature. However, as temperature rises the oxygen content of the water falls. Water at 26°C holds only 2/3 the amount held at 6°C. Therefore although many varieties of goldfish can fare well over a temperature range of 12-20°C (and above), many other coldwater fish prefer temperatures below 15°C. However, this problem may be overcome in most centrally heated homes by the avoidance of overstocking, and adequate aquarium aeration.

The large size of many coldwater fish limits the numbers that may be kept in an indoor aquarium. Therefore, even for the maintenance of a relatively small selection of fish, quite a large tank is required. Unless aeration and/or filtration is used, the much quoted rule of "six inches of fish to every square foot of water surface" may be used as a guide to the maximum carrying capacity of a coldwater aquarium. It must be remembered that fish do grow whilst in aquaria, and it is wise to allow for this by initially purchasing small fish. In fact, for successful coldwater fish-keeping, adequate aeration and filtration, along with regular (small scale) water changes, are considered very important.

What fish may be kept in coldwater aquaria? Small goldfish and fancy goldfish (including small

shubunkins, fantails, moors, etc.) are attractive hardy fish for aquarium, as are several species of British freshwater fish. Rudd, bitterling and bleak (which is also called the "willow blade" in some areas) will mix with other fish, and do well in an indoor tank. The otherwise hardy minnow may be kept, if adequate aeration is provided. This fish requires quite high oxygen concentrations when compared to many other freshwater fish. Rudd, bitterling, bleak and minnow will all accept the proprietary brands of flaked fish food. They do best if at least two individuals of the same species are kept, which is another limitation to the variety of coldwater fish that may be kept in a small aquarium. It has been found that roach (which looks very similar to the rudd) is not a very good aquarium fish, and is best avoided. The strikingly marked perch is an excellent tank inmate, though aeration is essential at room temperatures. This predatory fish should not be mixed with fish very much smaller than itself, and requires a variety of live food. For those interested in the unusual, the bullhead or "Millers thumb" should be considered. This rather toadlike fish does well in fairly cool aquaria. Because of its voracious appetite and large mouth, it should not be mixed with smaller fish. Plenty of live food is essential, and this fish will soon become tame enough to feed from the hand. The ubiquitous three-spined stickleback also requires live food, and does extremely well in aquaria. Because of its territorial habits, no more than one male stickleback may be kept in a small tank during the spring-early summer breeding season. Finally, the green tench (or the particularly beautiful golden tench) is a good aquarium fish, and feeds well on a variety of flaked, pellet or live food.

The list is not complete, and there is clearly much scope for the aquarist interested in coldwater aquarium fish-keeping. As always the importance of quarantine to newly acquired fish is paramount, and this particularly applies to fish that have originated from wild stocks. Further information or advice on coldwater fish-keeping can be obtained from Christopher Andrews at Tetra Information Centre, 15 Newlay Lane Place, Leeds LS13 2BB.



A fine male *S. discus* Heckel.

## THE HECKEL DISCUS FISH

(*Symphysodon discus* HECKEL, 1840)

Written & Illustrated by John Pinnock

DR. JOHANN JACOB HECKEL was an ichthyologist and explorer from Vienna, and it was he who, in 1840, provided the first scientific description of this fish. So it is that, in Britain at least, aquarists know *Symphysodon discus* by the name of its first documenter. In fact, Dr. Heckel must be regarded by modern cichlid keepers as a man of taste, for amongst the

June, 1978

many other species he first described are *Cichlasoma severum*, *C. festivum* and, probably the closest living relative of the Discus fishes, *Uaru amphiacanthoides*.

Although the original record was made in 1840 it was not until the 1930s, in North America and Germany, that the genus *Symphysodon* came once more to the notice of aquarists and zoologists. These

107

arrivals caused some confusion since they were not, in fact, *S. discus*, which was the only *Discus* species known at the time, but what we know now as *Symphysodon aequifasciata*—the Brown/Blue/Green etc. *Discus* fishes.

Controversy and confusion still surround the precise classification of the *S. aequifasciata* *Discus* fishes. Various sub-species have been distinguished. The scientific specifications of these sub-species, couched in terms of fin-ray counts and so on, rather suspiciously parallel the initial descriptions made by non-scientific aquarists in terms of the superficial colours of the fish. For the present writer, at least, the descriptions are none too convincing. For example, can one justify a scientific distinction based on a difference between spots and stripes, as is the case with the Green and Blue *Discus* fishes? Further, it is possible to find individual specimens showing any gradation of marking between any two varieties. 'New' types surface at intervals to confound matters still more. Is the rare, but certainly not mythical, Red *Discus* fish simply an extravagantly hued Brown *Discus* or genuinely a different fish?

However, as far as most aquarists are concerned, this issue of precise taxonomy among the *S. aequifasciata* fishes is, if you will forgive the expression, a Red Herring. The Heckel *Discus* fish is, though, a rather different fish both in appearance and behaviour to the rest, and I think that one can in confidence back its status as a separate species. Unfortunately, some confusion exists in the identification of the Heckel even so. There are to be found in various books and magazines references to Red, Blue, and Green Heckels, and possibly others that I have not come across. In the period in which I have had an interest in *Discus* fishes, I have seen thousands (literally) of imported specimens, and I can see no justification for any such distinction. In fact, Heckels are remarkable among *Discus* fishes for their consistency of form and colouring. As far as I am aware, there is no written evidence, photographic or otherwise, of any sort of 'different' Heckel.

So now it is incumbent on me to provide some sort of description of this fish (though this is a case where a picture is worth a thousand words!). Rather than retail the usual *Discus* characters I shall concentrate on those features which tend to differentiate the Heckel. The dominant discriminating feature is the form of the 5th, or central, vertical bar. On all other *Discus* fishes the first and ninth of the nine vertical bars are darker than the rest: the Heckel boasts in addition to these a prominent central bar which is always visible, unlike the others which can fade completely in moments of emotion. This central bar is not simply a larger and more intense vertical stripe, but rather it is an irregular pattern appearing to be composed of a column of short horizontal stripes. The body is partly or wholly covered with irregular,

horizontal, pale blue lines. The width of these markings and their extent varies amongst individuals. In healthy specimens the ground colour of the body is maroon as opposed to the gold-brown of other *Discus* fishes. The colour of the iris may be anything from a brown to fire-orange, but only rarely the crimson red usual in wild, and apparently universal in tank-bred, *S. aequifasciata* fishes. The anal, dorsal and pelvic fins are partially or completely striped red and blue. When a pair of *Discus* fish is intensely excited sexually, the caudal fin and the tips of the dorsal and anal fins become blackish in colour; and if those *Discus* happen to be Heckels then the black is suffused with red—a most impressive sight.

With the exception of fishes known to be tank-bred crosses, I have never seen a *Discus* fish with an appearance intermediate between a Heckel and a Non-Heckel in the same way that one sees fish that could be called either Blue or Brown, for example. Despite this, there are numerous mis-captioned photographs in books and magazines. Occasionally a Heckel is labelled as something else, but most commonly the error is in the reverse direction. There are two sorts of fish which are frequently mistaken in this way, both of which are more accurately known as the 'Royal Blue' colour variety, itself a trade name given to exceptionally fully marked specimens of *Symphysodon aequifasciata haraldi*, the Blue *Discus* fish. Hopefully, the three photographs shown here will help to clarify matters. Photograph One shows a Heckel *Discus* fish. Photograph Two is of a wild-born Royal Blue *Discus* fish, and Photograph Three again a Royal Blue, but this time tank-bred in the Far East, probably Bangkok. The blue stripes covering the bodies of the Royal Blues are wider and fewer in number than those of the Heckel, particularly in the case of the tank-bred fish. The Royal Blue is usually considered to be more brightly coloured than the Heckel, and indeed it is in most cases. One must consider, though, that the colours shown by the Royal Blue do not vary greatly with its state of health, while the best colours of the Heckel, which can be very bright indeed, are only shown by fully adult fish in peak condition. There is a photograph of a splendid *Discus* fish, taken by Wolfgang Bechtie, which appears in more than one American published book on *Discus* fish, and which will be known to any connoisseur of *Discus* fish literature. It is captioned as *Symphysodon discus*. It is not. It is a Royal Blue, almost certainly a tank-bred Far Eastern fish. It may well be that legends of 'Red Heckels' and the like, spring from fish, and captions, such as this one.

The Heckel has a particular attraction for many *Discus* keepers, myself included. An importer of *Discus* fish mentioned to me that he could sell many times more Heckels than any other type of *Discus*—if he could obtain them, that is. I shall not enter deep waters by trying to explain this attraction, but will rest

with the suggestion that it is based on the dignity that a more subtle beauty gives, for the Heckel is undoubtedly less gaudy than its congeners.

It is pertinent to state at this point that the Heckel has probably driven more people to distraction than any other fish, and for three main reasons: It is highly nervous, it is difficult to care for, and it is extremely difficult to spawn. And these remarks stand not only in comparison with the bulk of aquarium fishes, but in comparison with the other Discus fishes too, themselves known as rather highly strung and difficult to care for and breed. The Discus fish in general is not the real problem fish to care for that it once was. Useful information is available in English translations of original German works by such as Gunter Keller, and in a number of articles published in *The Aquarist*. Particularly useful are those by D. K. Brown and R. H. Cooke, and more recently by W. E. Thomson and several pieces by Eberhard Schulze. It is not my intention to repeat this information here, but rather to emphasize the particular idiosyncracies of the Heckel that require extra or different treatment, and accordingly I should like to discuss each of the three special problem areas mentioned above, in turn.

#### **The Nervous Heckel**

This fish is very highly strung and very much the wild animal. It is given to wild 'panics' in which all the Heckels in a tank will dash furiously up and down the length and height of the tank. Sometimes it is possible to determine a sudden movement or change of light that has initiated this behaviour, but frequently it is not—it all suddenly seems to become too much for them! For example they will sometimes panic in the apparently pitch dark and absolute still of night. The tendency to panic seems to run in cycles. For a month or so one is on tenterhooks when moving near the tank, and then for several months they become 'model prisoners.' All Discus fish show this behaviour to some extent, but the other types are far less prone to it and seem to control it much better when it does happen—that is, when startled, they make one or two wild dashes and then 'freeze.' One can fear for the safety of the Heckels as they dash wildly into solid objects in the aquarium over a period of several seconds.

What causes this behaviour and how can it be prevented? It is as well to begin by observing that it may not be pathological but natural, at least in part. The wild Heckel lives in a dimly lit environment. It is well shaded and the water is coloured or muddied, so preventing the transmission of much light. The root systems in which they are said to live provide an ever-present source of cover. A relatively defenceless fish living in such an environment would be expected to show quite a highly developed 'flight' reaction. The exposed setting of most aquaria must be likely to provoke this reaction. Most Discus fish keepers will

have noticed that the fish tend to start or even panic when the lights are suddenly turned off, but not when they are turned on. In other words a sudden fall in the level of illumination causes fright, but an increase does not. This corresponds to the potential threat of a falling shadow, which might well be that of a predator.

Having suggested that this flight reaction is in-built, we ought still to consider the other side of the coin—namely the provisions that can be made to minimise this behaviour. Undoubtedly, over-bright lighting conditions aggravate matters. One does not necessarily have to reduce the power of the lights to correct this. Darkening the water with a peat extract or peat in the filter is usually very effective. If you feel that the base or side coverings of the aquarium may be too bright, these can be darkened too. Black, though, should be avoided since the fish partially camouflage their own coloration to that of the surroundings, so black will dull their apparent colours. If the aquarium is planted it may well prove impossible to arrive at a single overall level of illumination which is both bright enough for the plants to grow, and dim enough for the fish to feel secure. One possible solution is to vary the lighting conditions through the tank so that there are strongly-lit patches where the plants can be grouped and darker areas where the fish can remain if they prefer.

It seems likely, though I know of no definite evidence, that particular unsuitable water conditions, such as a high bacterial count, might contribute to this condition of nervousness.

Finally on this point, one ought to make sure that there are not sharp objects in the aquarium on which the fish can damage themselves.

#### **Care of the Heckel**

Although I agree with those who have suggested that the Discus fish is not the problem to maintain that it once was because of the information now available, that is not to say that all problems have been solved or that no skill is needed by the aquarist to apply this knowledge to the care of his charges. In summary, it is quite possible to maintain the Discus fish in good health over long periods in the aquarium but it needs a deal of attention and skill, and the Heckel requires just a bit more of each.

More specifically then, just how does the Heckel differ in the demands it makes of its environment?

It is more tolerant of both low pH and high temperature than the other Discus fishes. If, for some reason, the water in an aquarium containing a mixture of varieties becomes excessively acid, it will be observed that any Heckels present remain comfortable when other Discus are showing distinct symptoms of acidosis, such as clouded eyes and skins, and ragged fin edges. These symptoms begin to become evident on, say, a Brown Discus fish below a

pH of about 4.8. Of course, one should try to prevent things ever reaching these dangerous regions anyway, but this tolerance of acid conditions may be a pointer to the optimum state of affairs as far as the Heckel is concerned, of which more later. Similarly, when the water temperature reaches about 94°F any Heckels in the tank show no signs of discomfort, and indeed may become unusually lively, whilst other Discus fishes begin to breathe quickly with exaggerated gill movements and will probably remain in one spot in the aquarium until things return to normal.

On the question of diet, the Heckel is at least as catholic in its tastes as other Discus fishes. I along with, I suspect, many other Discus keepers, have chosen to make ox-heart the mainstay of the Discus fish menu for reasons of both convenience and economy. Heckels always seem to be fond of this stuff, but I have owned several other Discus fish that would not touch it. All is not plain sailing, for although the Heckels are as easy to please in this way as the other types, it can sometimes be difficult to induce a newly imported or purchased Heckel to begin to feed. Assuming that the fish is not severely diseased or debilitated, the necessary push to begin feeding can often be provided by dropping the pH of the water by about one whole point (for example from 7.0 to 6.0) and or by raising the temperature by about 5°F (for



A wild-born male Royal Blue Discus *S. aequifasciata* Haraldi Schultz.

Above right: Another male Royal Blue Discus but this specimen is from Bangkok.

example from 85 to 90). Probably the main cause of refusal to eat is the sudden transfer of the fish into more alkaline water. To support this suggestion is the observation that in an aquarium containing a mixture of Discus fishes, the Heckels appear happier following a renewal of the material in the peat filter, which is usually accompanied by a fall in pH, and more subdued following a water change which generally causes a temporary rise in pH. Brown Discus fish, for example, react more positively to the water change.

A key issue in Discus fish care is the prevention of disease. The Heckel, thankfully, appears less prone to the so-called 'Hole-in-the-Head' disease than its congeners, but compensates for this virtue with a greater susceptibility to bacterial infection, especially of the stomach. Such an infection is manifested by a swollen stomach, a higher than normal respiration rate and probably a refusal to eat. The main causes of this are chills and heavy bacterial populations of the aquarium (the state of affairs euphemistically known as Cloudy Water). Chills are preventable of course, but one must be particularly careful to properly thaw frozen food before offering it to the fish. The second mentioned cause is more difficult to control. The typical low-pH Discus fish aquarium has an unstable bacterial population. The problems this causes both for successful handling of the nitrogen cycle and the prevention of disease are very important, and are not given sufficient attention by most aquarists. This

THE AQUARIST

topic is outside the scope of the present piece, so I will merely mention the three main causes of unwanted explosions of bacteria in the aquarium. A familiar enemy is overfeeding. The amount of food that can be given before this occurs is governed principally by the condition and size of the filtration system, and not by the number of fish in the tank or the size of the tank. If the tank becomes cloudy then as far as the aquarium system is concerned, you are overfeeding. If the tank is crowded or has a limited filtration system, then this overfeeding can occur very easily indeed.

A second cause of cloudy water is a sudden, massive, change in the constitution of the tank water, occurring for example if a large part of the water is changed for fresh, or if the intervals between more moderate water changes are too short. It is not possible to give a firm measure of what constitutes too great a change since again it depends on factors such as filter capacity, tank population and pH which vary not only from tank to tank, but from time to time as well.

'Cloudy Water' can also be caused by the introduction of 'alien' water into the aquarium. That is, by the addition of a quantity of water, perhaps only a small amount, from another tank or source which has its own established population of bacteria. Since, as mentioned above, the bacterial population of the average low-pH Discus fish aquarium is unstable, such an infusion is likely to disrupt the balance existing in the tank and cause an unwanted blooming of the bacterial flora. Thus, contrary to first thoughts, one should avoid the transference of much water with fish from tank to tank. Although this procedure is normally recommended as an aid to smooth transport of fish, its benefits in this direction are likely to be outweighed by the effect mentioned above. One can avoid this problem in acclimatising a new fish by progressively adding water from the tank to the carrying container, and removing the water from the container to waste rather than to the aquarium. In this way the shock to the fish is minimised and only a relatively small amount of 'different' water enters the aquarium.

If a Heckel succumbs to such a bacterial infection, what should be done? It is necessary to facilitate recovery by clearing up the tank itself. This object can be approached by increasing the filter capacity, refraining from large and sudden water changes, and, if you have the equipment and are competent in its use, sterilising the water with ozone or uv radiation. (N.B. Use neither of these techniques when any medication is present in the water.) Even so, be prepared to wait some time for the water to clear.

If the affected fish still feed, the condition will usually clear over a period of weeks if they are fed green food such as spinach, soft green algae or partially boiled lettuce.

If they do not feed, a recovery may be produced by

exploiting, as one often has to, the ability of the Discus fishes to withstand unusually high temperatures. Raise the temperature *gradually* (2 to 3 degrees F per day) to 98-100°F. Use a good thermometer (obviously), increase the aeration provided, put no food into the tank, and observe the fish very closely. At the first sign of severe discomfort, reduce the temperature slightly, wait a few days and then begin to raise it again. It is wise to remove any unaffected fish to another aquarium since this is an arduous treatment that sometimes proves too much for the fish concerned. If possible the temperature of 98-100°F should be maintained for three days. Recovery is indicated by the clearance of the stomach via copious long white droppings.

In summary, one might say that the Heckel requires a greater degree of stability in its environment than other Discus fishes. Long term balance of such factors as acidity, bacterial population and the control of nitrogenous products is a complex topic outside the scope of this article, but to any serious Discus keeper I would recommend 'Fish and Invertebrate Culture (Water Management in Closed Systems)' by Stephen Spotte (1970, Wiley-Interscience, New York). Although written mainly for the marine aquarist, the principles described apply to any aquarium. It is not a cheap book though, and not for the beginner. You will find no photographs!

#### Spawning the Heckel

So, the Heckel can be alarmingly nervous; it needs a slightly higher standard of maintenance than other Discus fish, and prefers rather different conditions. Finally, the question of breeding this fish. Wild Discus fish in general are difficult to induce to spawn, sometimes reluctant to care for the youngsters, and those youngsters are in turn very particular in their requirements if they are to develop into fish of the same quality as their wild parents. The Heckel is even more difficult to spawn, and it may also be more difficult to raise the young, though as spawnings of this fish are so rare one can only guess at this.

If I may express a personal opinion here, I believe that hybridisation between Heckels and Non-Heckels should be avoided, except for genuine experiment. The Heckel is a separate species and should be treated as such. Mongrels produced in this way will not have the integrity of marking of either parent. In years to come there is likely to be a short enough supply of these fish in our tanks without worsening the position by mixing the blood of the stock that we have. Naturally, it is hard to spurn a spawning which is so difficult to achieve in any event, but such temptations can be avoided by keeping Heckels to themselves, which they seem to prefer anyway.

Why is it that this fish is so difficult to induce to spawn? Any answer to this problem must embrace three separate questions, namely: Is the Discus fish in

general, and the Heckel in particular, reluctant to spawn

- (1) by simple virtue of its state of captivity?
- (2) because physical conditions in the aquarium are not of a sufficiently high standard compared to those of its natural home?
- (3) because there is some necessary spur or stimulus to spawn that the aquarist is as yet unaware of?

Clearly, any highly strung and intelligent wild animal is going to prove reluctant to reproduce in captivity, even if most conditions provided closely parallel natural ones. There is no doubt that successive generations of fish in captivity become easier to spawn, presumably because those fish that adapt best spawn most freely, though it must also be said that the fish themselves tend to become less robust. Evidence from the early days of the Angelfish (*Pterophyllum scalare*) in aquaria is to the point here. At first it was a challenge to the expert to breed these fish, but now, dozens of generations later, most people with adult angelfish in community tanks have seen them spawn. On the other hand, the so-called Deep Angelfish (*Pterophyllum altum*) which is a very similar fish to the wild *P. scalare*, has only been seen in Europe a few times and appears to have defied some elaborate attempts to reproduce it. Already the tank bred Far Eastern Discus fish breed noticeably more readily than wild fish, though unfortunately defects such as split vertical markings tend to nullify this achievement.

In short, it is entirely to be expected that such a fish should at first be difficult to breed in captivity, but while I do not think it justified to suppose that any particular individual would prove 'impossible,' it is probably wiser to try and obtain fresh specimens if certain fish appear unresponsive. Be sure that water conditions are not to blame first though!

Are the conditions in our aquaria good enough? The first observation one might make is that even with the excellent information brought back from the Amazon Basin by a number of Aquarist/Scientist/Explorers, we still do not have a complete picture of the natural biotope. As aquarists we tend to fall to the fallacy of ascribing importance only to those parameters that we can see or measure. It must be remembered that we measure that which is simple to measure. Of course, much of this is valuable, but not everything worthwhile can be revealed by a few drops of coloured indicator. For example, it would seem likely that trace elements present in the water are important to health, as they usually are, yet because it is beyond the capacity of most of us to assay such things, they tend to be ignored or forgotten—they should not be.

There is an interesting suggestion that we look after our Discus fish too well—that is, they are pampered and become overweight, bored and sluggish, and hence there is no spawning activity. Though fascinating, I think that this idea is wrong, though one must agree

that overfeeding is undesirable. The logic of the argument is basically that, since one encounters Discus fish that are apparently content and yet make no attempt to spawn, they have things too easy; conditions are too good. Equally as logically, and I think more correctly, one could argue that conditions are not good enough, and here one must bear in mind the point made above that 'conditions' applies to more than just those things that the aquarist falls into the habit of measuring. It seems to me to be fundamentally unscientific and unproductive to talk in this way, of things being 'too good.' A significant pointer to the disparity between the qualities of Natural and Aquarium Discus waters is the fact that wild Discus fishes do not succumb to the parasites that they all possess, but remain in equilibrium with them. In the aquarium, however, the aquarist has to take positive medical action to maintain this equilibrium—which of us has not had to do that?

Is there some stimulus to spawn that we are ignorant of and do not provide?

German aquarists have developed the technique of initiating spawning via a sudden and massive influx of pure, demineralised water to the aquarium, usually at a lower temperature than that of the tank water. Whether this acts simply as a sharp jolt, or is actually a mimic of some genuine Amazonian phenomenon, such as an ingress of flood water, is not known. With most Discus fish this works well, though it must be stressed that it is intended to act as a final spur to fish already showing positive spawning behaviour. It is no form of magic and will not produce a family from any two moribund creatures! However, it will probably come as no surprise to you to read that this technique does not appear to work with Heckels, and carries with it, in addition, the very real risk of causing a bacterial infection of the type mentioned above, due to the effect of a quantity of cool, fresh water. Subject Heckels to this treatment only with caution.

The actual nature of the spawning site is of interest to some fish. For example, a bogwood root might produce no reaction but a ceramic pot does. It is worth offering a selection of objects for this purpose, of various materials, shapes and sizes.

Some aquarists have experimented with chemicals, both organic and inorganic, in the hope of discovering a spawning stimulant, but with no firm conclusions. It would be unwise for unqualified persons to experiment in such ways, though doubtless experts in this field have something to contribute if only they could be interested! It is likely that fish would already have to be showing some sexual behaviour before such a stimulant could be effective, and that the application of a particular substance would have to be closely matched to the stage of the spawning cycle that the fish were in.

Continued on page 114

## THE HECKEL DISCUS

continued from page 113

Finally, the source that most aquarists turn to for a spawning conditioner—live food. It is my own feeling that the propensity of live food to introduce disease into the aquarium counterbalances its food value as far as normal raising and maintenance of Discus fish are concerned. It is certainly possible to raise and spawn non-Heckel Discus without using any live food (except at the fry stage of course). In view, though, of the proven conditioning qualities of live food it would seem foolish to exclude its use with difficult pairs of Discus fish. Mosquito larvae and Crustaceans such as large species of *Daphnia* are particularly popular. If you can obtain them, Heckels become especially excited by freshwater shrimps (*Gammarus sp.*). I have kept Heckels in an aquarium with an algae filter attached. This is a device more frequently used by marine aquarists. It consists essentially of a series of plates or sheets over which the aquarium water is passed. The whole thing is brightly lit to stimulate the growth of green algae, which has a number of beneficial effects on the water which passes over it, such as a denitrifying ability. Occasionally a piece of soft green algae becomes

detached from a plate and is carried into the main tank. I noticed that the Heckels would watch the return syphon from the filter and wait for this morsel. When it appeared, they would race for it! Might this mean something?

I feel that there is probably no one piece of knowledge or husbandry which is missing from the Discus keepers' armoury that when fitted into place will guarantee success. Rather, one is dealing with an inherently sensitive fish requiring specialised conditions by no means easy to consistently provide. Above all, one needs the good fortune (or persistence!) to acquire a reasonably co-operative pair of fish, and the skill to provide just the right conditions for an extended period of time, for these fish do not rapidly come into spawning condition.

Many people regard the Discus fishes as the crown jewels of the freshwater aquarium, and many amongst these, in turn, have the greatest admiration for *Symphysodon discus* Heckel. Let us hope that we can establish this marvellous fish as an aquarium fish, and not rely exclusively on imported specimens. If this is to occur, it is necessary that aquarists devote careful and studied attention to the Heckel, and pass on their theories and discoveries in magazines such as this.

## S.A.F. 1978

continued from page 102

of a very high standard indeed with the various societies and individuals having spent a great deal of time and effort in getting their set-up just right. I feel sure the general public must have picked up quite a few ideas to take home and try in their own tanks.

It was nice to see our other English friends back this year with the furthest travelled coming from Basingstoke. They did not come in vain either, lifting the "Stan Taylor" Trophy, the Aquarama Trophy and Hartlepool Trophy. While Aireborough, who missed last year's show, took home the George Henderson Trophy with a nice *H. Enessi*—these fish are becoming very popular with exhibitors and are being seen more and more at open shows throughout the country. The Earl of Motherwell & Lanarkshire Trophies are also on their way back to Yorkshire.

All the trophies did not go South however, it was particularly pleasing to see clubs like Wester Hailes (whose first S.A.F. this was) being awarded the Muirhouse Trophy with a pair of Honey Gouramies (*C. Chuna*) and the Mark Aitken Trophy with a fine *Corydoras melanistas*. East Kilbride took two trophies, the Edinburgh Pondkeepers and Hutchings.

The Scottish branch of the B.K.A. did not go away empty handed either, as they were awarded the Friendship Cup and the B.K.A. Trophy.

Once again, there was a fairly large turnout in the Schools Aquatic Art section in contrast to the very poor response in the Schools Furnished Aquarium section, there being only one entry—but a good effort by the two lads who did go to the bother.

Mr. John Young of *The Aquarist* did us the honour of presenting all the above trophies and a fairly large turnout stayed to watch the official proceedings.

The number of people through the doors was roughly the same as last year, and I think they got good value for their entrance money. The traders and societies had put real effort into making it a display to remember, while our catering staff maintained their usual high standard of service and food.

Most people coming to the Festival are completely captivated by the Motherwell Civic Centre, and the facilities that are available in very pleasant surroundings, and our visitors from South of the Border can be seen year after year at the "Scottish Aquarists' Festival" indicating that we have maintained a friendly, cordial and interesting show. We trust that our visitors enjoyed the event as much as the traders, exhibitors and various helpers did. Hope to see you all again next year!

J. GOODWIN

THE AQUARIST





# 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 have been keeping tropical fish for a great deal of time now, and would like to try the marine fish again. I say again as I have tried before without much luck. I read up on the best books I could get, got all the stuff I needed like test kits, salt, filters the lot, I let my tank sit for seven weeks until my water was right, going by all the tests. Now I was ready for the fish. I got two Clownfish to start with, then a Blue Damsel the following week, I only had them for three weeks when they all died. I tested the water, could not find a thing wrong, and put it down to bad luck. I bought some more—same thing happened again, and each time all my tests showed my water was all right. I tried again, bought a Banded Shrimp and Golden Sailfin Mollie. Everything going well, until one morning I came down to find that my tank had sprung a leak through the night and was empty, that was the last—no more marine fish, so went back to tropical fish again. Every time I read the *Aquarist & Pondkeeper* book (i.e. the *Marine Queries*), I get the urge to start again, but I am a normal working man and cannot afford to put out money like the first time. So, I have made up my mind to try our native marine fish. This will not cost me much as I live only 8 miles from the Ayrshire coast and can catch my own fish. What I would like to ask you is would I still need test kits the same as for tropical marines? Would my tropical fish food do, or would I have to feed them on a different type of food? Would an under-gravel filter be ample for this set up? I would be very grateful for any

information you can give me to help me get started. Also how should I establish a tank for Seahorses and what and how do I feed them?

I was saddened to read your catalogue of disasters recorded during your earlier attempts at keeping tropical marine fishes. Reading between the lines of your letter I would ascribe these losses to the following causes:—

(i) *An inexpertly-matured filter-bed.* Far too many "tyro" marine aquarists rush in with coralfishes where angels would fear to tread. That is to say that, until your seawater reads less than 0.125 ppm of free nitrite, (i.e. no pink colour even when looking vertically down the test phial) after adding the maturation fluid, you should not add any livestock other than "living-rock."

(ii) *The usual beginner's tendency to grossly overfeed*—in a marine aquarium, not one morsel of food should ever reach the floor of the aquarium uneaten.

(iii) The perennial inability of beginners to recognise disease symptoms in time to carry out effectual chemotherapy. Some authorities would go even further and complain of the inability of beginners to recognise disease symptoms *at all!* I would answer your questions in the order you raise them as follows:—

1. It would certainly be kinder to this planet's population of lower animals if you attempted to culture native marine lifeforms for a while before again attempting to keep tropical marine livestock. The reason for saying this is that the littoral zone animals to be found around the UK coastline are almost indestructible. They cheerfully withstand gross overfeeding and the inevitable ammonia/nitrite toxicity which stems from it. They tolerate poor

filtration, alarmingly low REDOX potentials and a range of pH-S.G.-Temperature fluctuations which is truly amazing. Indeed, it is only these animal's stoic refusal to expire under even the most appalling conditions which gave rise to the great explosion in marine aquarium-keeping in the home during the middle to late Victorian Era (1850-1890) in Great Britain. During this period such great English pioneer aquarists as Philip Henry Gosse and W. Alford Lloyd showed the way to the entire world as far as home aquaria and public aquarium design was concerned—and they did not even have air pumps or under-gravel filters, let alone test-kits. However, if you aspire to keep these British marine animals and plants in *perfect* condition, you will still find plenty of use for your nitrite, nitrate and pH test kits.

2. Native marine fishes and invertebrates will eat almost anything—including bread and cheese! I feed

the former to my blennies and gobies and the latter to a "strawberry"-type Beadlet Anemone, who now rejects everything except Cheshire cheese and squid!

3. An under-gravel filter is perfect for the native marine aquarium—but use your NITRATE test kit diligently. Some of the more delicate anemones (e.g. Plumose and Dahlia Anemones) will not tolerate a high level of nitrate toxins—though they can withstand up to 10 ppm of nitrite toxins.

4. *Sea-horses*—need the normal under-gravel filtered tropical marine aquarium, furnished with "living rock" and plenty of Gorgonian skeletons as "perches," BUT they (i.e. seahorses) are quite unable to defend themselves and so no fishes should be present other than pipefishes, *Plectorhynchus spp.*, baby Batfishes, etc., i.e. totally non-aggressive fishes. The only "dead" food which seahorses will eat in my experience is gamma-ray irradiated Mysis shrimps.

## Petfish Distributors' Association

FOLLOWING a second meeting held at the Allesley Hotel, Allersley, Near Coventry, on 10th March a group of Tropical Fish Importers decided to form themselves into an association to be known as the "Petfish Distributors Association." The Association would like to extend its membership to cover—Cold-water Fish, Aquatic Plant distributors as well as other Tropical Fish distributors and thus be truly representative of the aquatic trade.

Our aim is "to clean up" the aquatic trade and achieve a greater degree of co-operation within it. We are all concerned about the changes which are taking place on the Continent and the attitude of the United Nations over the importation of fish and feel that changes in legislation are bound to come to the U.K. Bearing this in mind we want to be prepared with our house in order and hope that we may be consulted over new regulations.

We have drawn up an outline constitution, etc., which can be summarised as below:—

1. Membership open to wholesalers wholly employed within the aquatic trade (Live Fish and Plants)—applications to be approved by the committee.
2. Entrance Fee £20 per firm—membership to belong to the firm rather than the individual (Exception being that committee members individuals not firms.).
3. Meetings to be held 1st Friday of March, June, September and December at Allesley Hotel. (£5 per meeting—payable in advance to cover

cost of lunch, etc.).

4. Applications for Membership to be in one month before meeting.
5. Members must have acceptable facilities.
6. Members must undertake to accept all shipments of Livestock, no matter how long delayed. Any Member refusing such a shipment will be asked to resign. (An offer by the airline concerned to sell shipment en-route does not constitute a refusal.)
7. Transshipping—generally not favoured but better in hands of established firms within trade than outside it. Members can tranship if approached to do so but should not advertise such a service.
8. As a group should co-operate over diverted shipments and if clearance can be arranged Members near diverted destination should accommodate shipment. Would in future like to extend idea to cover continental diversions.
9. Try to achieve complete unity amongst distributors and improve standards within trade.
10. Members to make every effort to attend meetings.

Any firm interested in joining should please contact the Secretary, Mrs. Beryl Ryan, Fanday Aquatic Imports Ltd., Brandheath Lane, Astwood Bank, Redditch B96 6NQ. (Phone: Astwood Bank (STD 052 789) 2975).

# From a Naturalist's Notebook

by Eric Hardy

## Nature Nuts

It is not surprising that Texas tycoons labelled their conservationists "nature nuts" and even "goddamned Commies" when the Department of the Interior placed expansion restrictions on zones because they harboured the toad *Bufo houstonensis*, in danger of extinction. U.S.A. croaks a lot about its frogs and toads because it has many in its swamps and rivers. The University of Texas recently described a new species of tree-frog, *Hyla microderma* from the Vaupes river of Colombia.

They aren't alone in this search for new species. Two new frogs have recently been described from the Khasi hills of India, *Rana danieli* and *R. macphlangensis*, while another new Hylid tree-frog ("overlapping chested" family) is *Litoria longirostris* from Northern Australia. *Gyrinophilus subterraneus* is a new troglobitic salamander from southwest Virginia. From east of Para in the Amazon Valley comes a new American greaved lizard, *Crotosaura landii*; from the Nicobar Islands of India a new skink *Dasia nicobarensis*; and from the Mexican Sierra de Coalcoman a new colubrid snake *Geophis pyburni*. Believed extinct, the frog *Rhacophorus robinsoni* has been re-discovered in Malaysia.

Interesting studies of behaviour range from recent work at New York University on the licking response of iguanas to unusual situations, to the fighting ritual for social dominance among American King snakes and male iguanas. Incidentally, two recent attacks by alligators on humans in Florida were recorded. At Utah University a simple water-pump has been devised to flush the stomach contents out of Australian turtles, via the mouth, for food studies. *Enhydryna schistosa*, a mouth-rot disease infesting captive sea-snakes in India, forms another study.

June, 1978

## Longevity

How does one age a viper? At Paris University, skeletal growth-marks are used to indicate the age of the asp. Snakes and lizards are not among the long-lived animals, excepting the tuatara which lived 77 years in captivity in New Zealand and 33 years in Dublin Zoo. Pythons have lived 18 years and boas 23. European glass-snakes lived to 24 and 25 years, a black-lipped cobra 29 years in San Diego Zoo.

Flower recorded 10 snakes over 20 years in captivity, including a long-nosed viper 23 years.

The world's remnant of endangered snail-darters, 3 in. Little Tennessee River relatives of perch, lost a significant proportion of their numbers last autumn when 98 died. A conservation effort was moving them out of danger in the lower reaches, where a giant dam is being constructed. The small dip-net used to transfer them between buckets was found to be contaminated with rotenone. Only 1,400 of these fish are now estimated to be left. In Britain, the Nature Conservancy has expressed concern over the fate of freshwater fish where rotenone is used to clear areas for trout-farming.

## Crayfish

Anyone who keeps crayfish, shrimps and other arthropods for observation will realise that as these creatures haven't more than 100,000 or one ten-millionth the estimated number of nerve cells in mammals, their complex behaviour is all the more interesting. It was a breakthrough when Prof. C. A. G. Wiersma recognized crustaceans' individual nerves by their function, which discovered the science of cellular analysis of behaviour. Adaption and complex learning have since been shown in these jointed-bodied, lower animals which exhibit per-

117

sonalities in their stereotyped and rhythmic patterns of behaviour. Thus biologists learned to control the crayfish's escape behaviour and learned more about eye-movements in crabs. A £24 American memorial volume on this work has just been dedicated to the professor. Even dearer is a new book from the American Society for the Study of Amphibians and Reptiles, on the reproduction of amphibians, from the courtship of European newts and the calling behaviour of European tree-frogs to the hybridization of the frogs *Rana esculenta* and *R. lessonae*.

The Council of Europe's committee of consultants has been set up to compile this year a list of rare, vulnerable or endangered freshwater fish in Europe, specifying preservation measures and causes of decline. Their study of threatened European amphibians and reptiles has been approved for publication this summer.

### Reptiles

After several field-guides to our freshwater fishes, comes at last a comprehensive new 272-page, illustrated *Field Guide to the Reptiles and Amphibians of Britain and Europe* by E. N. Arnold and J. A. Burton, with 257 colour illustrations and nearly 100 others by D. W. Ovenden (Collins, £4.95). It is, of course, everything one would expect, and a necessity on every amateur herpetologist's bookshelf. My only criticisms are small ones. There is nothing like the reference to synonyms one found in Cooke's old Victorian book on the British species. The novice looking for the well-known wall-lizard under its old name, still used in many nature magazines and books, *Lacerta muralis*, would not find this indexed or mentioned as a synonym for modern *Podarcis muralis*. Its vernacular name is only indexed as Common Wall. Likewise tracing the old Greek cat-snake, *Tarbophis fallax* (now *Telescopus*), once escaped in Sussex. Distribution-maps are small of necessity and do not mark the small colonies of marsh and edible frogs or of midwife and clawed toads, mentioned in the brief chapter on these animals in Britain. No maps are given for the sea-turtles, which must be regarded as accidental visitors. It does not mention the black or very dark grey variety of slow-worm, described in recent years from Devon and Kent.

With 85 land reptiles and 45 amphibians, Europe's richer fauna emphasises the poverty of British species. Few visitors to the Mediterranean can escape noticing reptiles by day, or hearing frogs at night. Crete and the Greek islands are included in the guide, but not those further Mediterranean isles on the African continental shelf. A brief paragraph on keeping them as pets is largely condemnatory and might have been better with some practical advice on a well-managed, adequately-sized outdoor vivarium which is hardly a "miserable travesty of their natural existence," and was first established pre-war at Whipsnade and in the

late L. G. Payne's Richmond garden. Not everyone has the generous study-grants to travel over Europe that are lashed around to the fortunate. Grass-snakes are not mapped in Scotland, though there have been a few records in recent years, e.g. Mearns Castle, Renfrew, Glen Afton, etc. The French bibliography might have included Guibe and Thireau's 124-page 1977 book, *Les Batraciens*, published by the French University Press.

Surprisingly, the list of 3 disc or taped recordings are all foreign, omitting the excellent bands of British native and introduced amphibians on the BBC Enterprises' disc of British Mammals and Amphibians. There are useful identification keys, including tadpoles. One may sometimes have identification delayed by albinistic forms, like white specimens of the Greek cat-snake found at Ditchling and Littlehampton in Sussex in 1930 after escaping from imported fruit or some pet collection. However, albinos, like two-headed snakes and six-legged frogs, are dismissed as temporary localised "sports" of no field value; but there have been albinistic strains of common frog and its tadpoles persisting for a few generations in areas.

An aquarist's life is endangered more by using faulty electrical equipment than by the inmates of his tanks, excepting for dangerous serpents. Much is written in newspapers about the danger of pet piranhas. The late Wm. T. Innes, godfather of American aquarists, showed a film of a young pig dipped into a Brazilian river until ripped and eaten alive by these fish. The shoaling Natterer's piranha, most widespread of some 20 South American piranhas, is responsible for most reported native deaths. A score of venomous fish in the world range through weewers, spiny dogfish, stingrays, catfish, elephant-fish, scorpion-fish, stonefish, zebras, rabbit-fish, toadfish, star-gazers, surgeons, waspfish, cobblers, red rock "cod," spinefeet, frogfish, etc. There are nearly 40 electrical fishes and many more which, like the piranha, attack with their teeth.

Roger Caras' new Pelican paper-back *Dangerous to Man* (326 pages, Penguin Books, £1.50) states that: "effective antivenins for fish venoms are not generally available" then later states: "there is an effective antivenin for the stab of the stonefish" the most dangerous of all. His book deals with venomous lizards and snakes as well as fish and other animals, with some good photos of sea-snakes. The electrical eel, which is not a true eel, has such rudimentary gills that it will apparently drown if held too long under water. Certain minute parasitic South American candiru catfish (*Vandellia cirrhosa*) are reputed to have such a strange affinity for urine as to acquire the bizarre habit of attaching to the urogenital organs of humans bathing in their haunts. Many attacks by piranhas, etc. are more often quoted than seen, and the popular film "Jaws" did not do much to temper the fiction.

# WHAT IS YOUR OPINION?

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

Photographs by the Author



"I THINK your magazine is magic; I wish it were weekly," writes Mr. Stewart Laird, from 19 Halmyre Street, Leith, Edinburgh, Scotland. Stewart continues: "Your column is a wealth of information for beginners and has helped me with many problems I have come across. On seeing prices charged for bogwood I decided to prepare my own wood. I boiled it in salt water, then stripped off the bark, cleaned it and boiled it until it was water-logged; washed it and then placed it in my tank; and it looks great! I found three pieces of log, 18 in. long by 4 in. wide; I split them in two, hollowed them out, then stuck them together again with tank glue, and placed them over U/G air lifts and water heater. If any readers would like to write to me about breeding and keeping kribensis, rams or dwarf gouramies, I should be very grateful."

"I think it is a great idea to have an 'Exchange and Wanted' column, says Mr. M. Coe, of 20 Saulisbury Street, Kettering, Northants. "I wish to obtain a pair of *Crenicara maculata* (checkerboard cichlid) and *Apistogramma reitzigi* or *A. borelli* as these are almost impossible to obtain in this district. I would be able to collect."

Mr. John A. Craggs sent me the following letter from his home at 48 Deans' Walk, Gilesgate, Durham. "First of all I must thank you for the Java moss and the other hornwort-like, unidentified plant. Both plants stood still for several weeks, probably taking time to adjust to a pH of 6.2; and as my angels occasionally had a go at the 'hornwort' I thought I was going to lose it altogether. Eventually, however, it became entangled in some Java moss and burst forth in no uncertain manner. Within two weeks I had several strands of 15 in. in length, enabling me to start distributing some portions to my friends. Both my own and that of my friends have continued to grow quite rapidly; but, as you stated, it is very easily controlled. The Java moss is now growing steadily and has almost doubled in quantity. Unfortunately my other plants are not as successful as these two; most of my swords and *Vallisneria* grow, but only to half their original height. Lily and *Aponogeton* 'bulbs' are slightly more successful—but not dramatically so. This is in spite of using 'Velda Aquasoil' in the gravel, tablet food for the plants at the time of planting, and the addition of

liquid plant food at fortnightly intervals. My only successes have been with floating plants: first with water sprite; and lately with American frogbit. I have to discard portions of both of these at regular intervals and find the frogbit easier to keep as it sheds only the occasional leaf; whereas the large water sprite leaves sometimes disintegrate very rapidly.

"I have also tried the plant plugs but, like yourself, I have lost most specimens planted in them; while others, bought at the same time and planted only in gravel, continue to grow—although at a rather slow rate. This pattern has prevailed through various levels of lighting, temperature and pH.

"Part of my reason for waiting so long to thank you was to see how three young discus settled in for two or three months. This was my first experience with discus so I chose three young browns hoping they will be hardier than the blues or greens. I set the tank to 80°F, with a pH of 6.4, and kept neons, *Corydoras* and *Otocinclus* in the same tank for the time being. I am glad now I chose to do this as they certainly help in consuming food which the discus reject. Frozen bloodworms and freeze-dried *Tubifex* are accepted greedily; but all other foods are picked at for a considerable time before being eaten, irrespective of whether they are live, frozen or dried foods. This can be both disturbing and annoying and I only hope things improve. I do try to give three or four different feeds each day and trust that these will prove adequate. At the time of purchase two fish were approximately 2 in. in diameter, and the third a little smaller but more colourful. This third fish was continually bullied by the other two for the first two weeks; then shortly after the smaller fish was doing the bullying—but only at meal times. Now the third fish is approximately 2½ in. in diameter while the other two are only 2¼ in. All three seem quite happy and healthy and I only hope they remain so."

I think the relatively acidic reaction of your aquarium water is the most probable cause of the failure of some of your plants to grow large; but a discus tank is certainly not the most favourable environment in which to attempt to cultivate aquarium plants. My Java moss and unidentified hornwort-like plant continue to grow apace—currently, on the last day of March, to the extent that I shall have to throw

some out. Unfortunately you will not be reading this until June by which time I may not have any excess of either plant; however, anyone prepared to risk wasting the price of a couple of stamps, an envelope and a polythene bag may, if he or she wishes, ask me for a starter sample of either plant. After the trouble I had last time I made such a general offer I shall make some specific stipulations: send me a self-addressed envelope bearing a 9p stamp; on the back print Java moss, 'hornwort,' or both; and place a fairly small, waterproof polythene bag inside the s.a.e. If I still have stocks of either or both plants I shall forward a sample, as appropriate; if stocks are somewhat low, but there is a chance of their improving fairly quickly in the near future, I'll retain the envelope and polythene bag and forward a sample when it's available; if stocks are very low I shall simply return the empty polythene bag in the envelope. Please do not include any letters or queries with the envelope and bag because I do not and will not have time to write replies. If I have any spare plants you'll get them quite quickly through the post; if you receive an empty polythene bag you'll know that stocks are exhausted; if you receive no response for a period you'll know that I'm retaining your request in the hope that stocks will improve in the near future. It should not be as complicated as it sounds. I must admit that it amuses me to think that Java moss from Northern Ireland is now flourishing in places as far away as the U.S.A. and Central America. I should be pleased if anyone could identify the hornwort-like plant that is now thriving in numbers of tanks. Like my original piece of Java moss, it must have arrived in one of my tanks as a small segment caught round some plants that I bought by post several years ago. I shall now attempt to continue this month's feature without using the words 'Java moss' again.

I was pleased to receive copies of the first two editions of the magazine produced by Thorpe and District Aquarist Society. Both magazines contained interesting articles—and the second one some excellent reproductions of photographs of marines taken by Mr. Kevin Appleton, of 57 Belmore Road, Thorpe-St-Andrew, Norwich. Mr. Appleton, who certainly knows how to take photographs of the inmates of aquaria, is Chairman of the Society and Editor of its Magazine. In his letter, Mr. Appleton had the following to say: "Our Society was formed at the beginning of the year and our membership stands at just over 85 people. Approximately 175 people have so far attended our meetings and more join each month. We aim to cater for all aspects of the hobby and are fortunate in having Dr. David Ford (of 'Aquarian' fame) as our President. A full programme has been arranged for this year—including a visit, in a few weeks' time, to the aquarium at London Zoo." New members are welcome to join the Society, and meetings are held on the first Wednesday of each

month at Canary P.H., Heartsease, commencing at 8.00 p.m.

The above magazine contains an interesting paper, entitled *Protein and the Aquarist*, by Dr. David Ford. The same paper appears in the latest edition of Hemel Hempstead Aquarist Society's Magazine, kindly sent to me by the Society's P.R.O. and Magazine Editor, Mr. Keith Puleston, who lives at 27 Cuttsfield Terrace, Chaulden, Hemel Hempstead, Hertfordshire. Mr. Puleston kindly gave me permission to quote part of an article he published in his Society's Magazine. It deals with U/G filtration. Keith writes: "... My factual advice, rather than expressed opinion, for those of you who may be interested in investing in a cheap, unobtrusive method of keeping aquarium water clean, is as follows. Use at least 3-4 in. of normal aquarium gravel. Run the filter at tick-over speed. I use the extension tubes with the bend-over tops. By adjusting these so that the bottom lip lies on the water surface, the filters will run almost silently; and you can see exactly how much water is being moved. Use the standard tubes in a deep aquarium and the sound will be like that of the loo filling up! Cut the air inlet tubes at a 45° angle before sliding into the air lift tubes. This prevents blockage if you push them to the bottom; and also allows the bubbles to 'peel off,' at the bottom, almost soundlessly. Never turn off the filter.

"Out of interest, many years ago, I took apart an aquarium that had had a U/G filter fitted and running for four years without attention. There was no sign of blockage in the perforations and the gravel was relatively clean. I am expecting my set-up to run for another two or three years before I decide to do a major overhaul. As far as lack of maintenance goes, the U/G filter can't be beaten. So, there you go: a cheap and effective way of achieving water clarity without using ugly box filters or lashing out forty odd quid on a power filter.

"But I'll let you into a little secret. When I do overhaul my tank, I am going to put 2 in. of John Innes (compost) on the bottom, do away with the U/G filters, and connect up a lovely big Eheim..." Earlier in the lengthy article Keith says: "... With the exception of *Vallisneria*, my plants grow well. I use a True-lite tube; and place the bigger *Cryptocoryne* species in plant plugs. They sprout babies at an alarming rate..." (I thought it only fair to include Keith's latter comment because it shows that a product with which one person may have little success can prove to be a great success in another aquarist's aquarium.)

A number of letters, without names or addresses, have reached me recently; and very few contributors bother to put the date on their letters. A few pointers could be useful to some readers who do not write letters very frequently. Please *PRINT* your address in the top right-hand corner of the first page of your

letter, and write the date underneath your address (the date will let me know when your letter was written—and this is important information if, for some reason, I have to retain your letter for some months before using it). Remember to write in sentences (a sentence should end with a full stop and not a comma) and paragraphs. If you use the correct names of fishes or plants, please check the spelling of each name and *PRINT* it clearly. Please remember to put my name on the letter; and don't forget to *PRINT* and sign your own name at the end or I shall be unable to consider your letter for publication. A paper-clip is useful if your letter stretches to several pages; and it would help if each page were numbered. Letters that are typed make my job a lot easier.

Photograph 1 shows a beautiful male guppy. Have your guppies won any prizes for you?



The following letter was written by 13 years old Andrew Young, of 43 Lawn Drive, Swinton, Lancs. "In the March issue you asked how readers were introduced to the hobby. On a visit to a local library I noticed a book about marine fish and I thought, 'I must have these;' but after seeing the prices of them I decided against buying them! Anyway, a friend said he had a 24 in. x 12 in. x 12 in. all-metal (*sic*) tank. I had to have it! Then the friendly, next-door neighbour gave me a pump and a combined heater/'stat. I had to buy a U/G filter, gravel and a few plants myself. Altogether I spent £4.00 to start the hobby. I was also given 3 fish by a friend.

"I had to buy a 24 in. x 15 in. x 12 in. all-glass tank a few months later. One of the first fish I bought was a blue acara which, as I found out, was not a friendly fish: it ate six neons in two weeks. Since my earlier days I have improved; and now I have around 80 plants in my 2 ft. tank. I don't include any *Cryptocoryne* because they are so expensive—any

offers, readers?—and I can never get my aquarium looking just right. Still, I hope to get a 4 ft. tank soon. Finally, are there any other 13-14 year olds who would like to write to me about the aquarium-keeping hobby? Thank you for listening."

"I have never written to a magazine before but decided to put pen to paper after reading about your depressing experience of four dead fish through the post... So I thought I'd do my bit to help keep an excellent article going in an equally good magazine. Living on the Wirral, I visit Chester Zoo every year, and I must say it maintains an exceptionally high standard of aquaria. In fact, this zoo must be one of the best, if not the best, in the country," says Mr. E. N. Peers, from 28 Langley Close, Bebington, Wirral, Merseyside. "A couple of years ago I visited Liverpool Museum—which does not have a large

number of fish but does cover every habitat from tropical freshwater and marine to local freshwater and marine. At that time they were certainly the finest specimens, in large, beautiful tanks, that I had ever seen.

"I thought you might like to know how I was introduced to marine aquaria. Well, a local pet shop closed down and the owner cleared all tanks except for a 3 ft. tank that was marine and housed a tiny hermit crab. He said I could have the crab as he couldn't get rid of it and if it didn't go he'd have to flush it down the loo! Needless to say I took the crab—along with a few gallons of water. On arriving home I put the bag containing the crab into my 3 ft. community tank and hastily set up an 18 in. tank with an internal box filter. Later I purchased an electric blue damoiselle fish; and about six months later transferred them to a 5 ft. x 50-gallon tank, and proceeded to buy more invertebrates and a few clowns. Unfortunately I lost a few specimens due to inexperience.

"I have since moved house and, consequently, due to the trouble involved, have sold all my marine and most of my freshwater fish to a local dealer. I understand where I went wrong and am hoping to re-start a marine invertebrate tank in 1978 as I feel that invertebrates are more interesting to watch as well as being very attractive." (Mr. Peers wrote his letter some months ago. Hopefully, by now, he will be back in business in a bigger way.)

Mr. T. Wells lives at 72 Hurst Road, Horsham, Sussex. He writes: "I have heard many rumours concerning the Madagascar lace plant, *Aponogeton fenestratus*—about how difficult it is to keep. I bought this plant from a local dealer along with some *Cabomba*, *E. radicans*, other swords and *Vallisneria*. The lace plant was planted in a 3 ft. tank housing two pairs of large angelfish. After a couple of days the lace plant

of a keen aquarist and I would be interested in the views of other 'fish-wives' on their husbands' hobby—or full-time occupation!

"My Saturdays are spent in our van, finding fish shops on maps from the addresses given in your magazine. I am quite familiar with most aquaria in London and its suburbs. I spend hours trying to look intelligently at interminable rows of tanks while my husband gazes intently at every fish and every label in case he finds a 'new variety.' One of our bedrooms is devoted entirely to fish; I have named it Parkside Aquaria as there are five tanks and their associated paraphernalia—as well as one large tank in the living room. Do all fish-wives suffer from wistaria in the wash-basin, duckweed and dead fish in the toilet, *Daphnia* in the tea strainer and rainwater in the kettle? Do all fish-wives supply slices of bread to feed a



sprouted a new leaf—which surprised me as I had heard that they died down after being moved. More leaves have grown; and after three weeks I have a very healthy plant that is sending up a new leaf every two days. The conditions it is kept under are as follows: (a) the tank has a 100 watt light bulb that is kept on for 10 hours per day; (b) the compost is sand with gravel sprinkled in it; and (c) the water is fairly soft and has a pH of 7.3. I feel people are somewhat misled by rumours as I have found this plant very easy to grow and hope to purchase some more very soon."

Photograph 2 shows a cardinal tetra. Have you successfully bred this species and raised any young? If so, under what conditions?

I think the following may be the first letter I have received from someone who does not read *The Aquarist*. Mrs. C. M. Wilkins writes from her home at 2 Parkside, Hampton, Middlesex. "I am not a reader of *The Aquarist* but I am the long-suffering wife

of a keen aquarist and I would be interested in the views of other 'fish-wives' on their husbands' hobby—or full-time occupation!

"And then there is the time factor. Do all fish-wives go to bed before their husbands, who have to put the fish lights out, and then appear about an hour later saying 'Sorry for the delay?' And why do live-bearing fish choose to produce their young when we are just about to go out? I could go on; but I'm sure I have made my point. However, despite all this, I am glad that my husband has such an absorbing hobby." (Do any other unfortunate wives have appropriate comments to make? If so, I should be pleased to publish some of such comments.)

'Bounty House,' Baredown, Nately Scures, Basingstoke, Hants., is the address that heads a letter I received from Mr. Adrian Blake, editor of 'Fish Forum,' the magazine produced by the 'twinned' clubs—Basingstoke Aquarium Society and South Shields Aquarium Society. He says: "... I have



enclosed some of our latest efforts for your perusal. I have yet to find one (magazine) to equal it. Please excuse the chest thumping. Keep up the good work." (Mr. Blake's are certainly very attractive and interesting little magazines stretching to 24 pages. The cover of each is enhanced by a photograph of a fish. The magazines contain news, views, articles and drawings that must certainly appeal to club members. I must pass on general congratulations to the many club and society members, round the country, who regularly edit and turn out club magazines. Although the typing, English and punctuation in some of them leave a lot to be desired, the magazines show that their editors, who don't get paid, must work very hard to produce their publications on a regular basis. I hope club members appreciate the efforts of their magazine editors; and that as many members as possible make an effort to provide copy for their publications. Those of us who write regularly for monthly magazines know how difficult it is to come up with something fresh each month; and those of us who edit magazines know how dependent we are on other people coming up with interesting material for publication. So, if you enjoy reading your club magazine and have not contributed before, make a special effort to support your hard-working editor by writing him a short—or long—article for publication. One doesn't have to be a scientific expert or a literary genius to come up with something that could be of interest to other aquarists.)

No. 18 Booth Close, Thamesmead, London SE28, is where Mr. Terry Flood lives. He informs me: "Recently I was looking through my binder for the last twelve copies of *The Aquarist & Pondkeeper*, trying to find a certain article that had been printed some time previously. I could remember the title but not which issue it was in. After fighting through the pages of each issue, looking for the contents pages, I finally found what I was after right at the front of the binder. Would you believe I started from the back! Wouldn't it be nice, I thought, if after each twelve copies—or in the twelfth copy—we could have a full, alphabetical index." (I also think it would be a useful idea. B. W.)

"You asked where tanks are sited in individual homes," continues Mr. Flood. "I have three tanks, one of which is a tropical tank; the latter is sited behind the door of my living room. I find this most suitable for many reasons—which are as follows: (i) when the door is open it blocks the tank from view so you have to close the door in order to see the tank, which in turn saves wasting electricity by stopping heat escaping; (ii) the tank is not subject to draughts when the door is open because the draughts go straight past the door itself and so past the tank; (iii) there are no radiators, etc. near the door so the tank doesn't get heated up by them. You also asked about the piece of equipment that has given individual readers the largest number of years of service. Well, what else could you

pay £2.00 for and be able to say you will still be using it in ten or more years' time with only the occasional rinsing? I am, of course, talking about the thirty or forty pounds of gravel required for a 3 ft. aquarium."

"My subject is that of how I was introduced to the hobby," writes Mr. A. K. Perkins, from 8 Eastrop, Highworth, Swindon, Wilts. "When we bought our present house it had a fish tank built into the fire surround. The previous owners had lost interest in fishkeeping, so we were left with about a dozen very small, sick-looking fish, and two stone ornaments. Knowing nothing at all about fishkeeping we went to a local pet shop and bought a few fish and plants. Luck was not on our side and we lost most of the fish.

"This left us with a tank very much as it was when we moved in. Then one day, while looking through the local paper, we spotted an ad. from a fish dealer. We decided to have another go and sought professional advice. As it turned out, the pet shop had a poor reputation for their fish; but with the help and advice of the dealer we finally got the tank into good condition.

"Since then things have improved considerably; and apart from the original 24 in. x 12 in. x 12 in. tank we have two 39 in. x 12 in. x 15 in. tanks—one stocked with Oscars; and a small nursery/quarantine tank. At one stage we tried keeping marines, but were not very successful. After two years of fishkeeping we are very glad that we overcame our initial disappointment and stuck with a very rewarding hobby."

I should be pleased to hear from you if your local radio station gives any air time to tropical fish hobbyists. Northern Ireland's commercial station, Radio Downtown, is taking up half of my attention while I conclude this month's feature. Tonight's hour-long Phone-In is on tropical fish and listeners' queries are being answered by two of this country's leading experts—Messrs. Alf Robbins and Bob McIlwaine. I've learned that numbers of aquarists are having problems with livebearers—probably resulting from the fact that many of the sources of water in Northern Ireland supply relatively soft water; the exceptions, apparently, include the Newtownards area. Readers in Northern Ireland will be interested to learn that during the first week in August the Province's leading aquarium show will be held—this year in Belfast's newest Leisure Centre.

I look forward to receiving your opinion on any of the following: (a) unusual livebearers that you breed; (b) the state of your garden pond in June; (c) the progress of your tortoise after hibernation; (d) whether or not you are able to make a profit from breeding and selling fishes, or cultivating aquatic plants, as a hobby; (e) the standards in aquarium shops visited while you are abroad, on holiday; (f) aquarium shows you have recently visited; (g) large cichlids.



#### Worms

In "A Tropical Marine Community Aquarium" in the January edition of *The Aquarist* Mr. Steve Pember asked if the strange, tentacled creature which inhabits a piece of living rock could be identified.

From his description it is probable that he has a terebellid worm. These animals belong to the phylum Annelida (segmented worms) which includes the familiar earth worms and leeches. They are included in the class Polychaeta along with ragworms, fan worms and lugworms.

Terebellids, much like the one described, can be found in temperate waters and last year I came across one on the Devonshire coast which was *Auphitrite johnstoni*.

I hope this information will be of some help.

Yours sincerely,  
CHRIS STOREY,  
9 Lyme Grove,  
Marple, Stockport,  
Cheshire.

#### ASRA

I am writing primarily, to introduce ASRA—the Association for the Study of Reptilia and Amphibia.

Formed in June 1977, the Association is slowly increasing its membership and is fortunate in having its own headquarters situated above the Reptile House at the Cotswold Wild Life Park, near Burford, Oxfordshire. Renovation work is currently in progress and the H.Q. will soon consist of a large meeting room, a kitchen, a small laboratory and a library.

Members will be actively encouraged to research into all aspects of captive husbandry, particularly that part of it which will lead to an increase in captive breeding. Serious researchers may also be given some facilities in the Park's Reptile House in which to carry out their work.

Further information on membership etc. may be obtained from:

The Membership Secretary,  
ASRA,  
c/o Cotswold Wild Life Park,  
Burford Oxon.  
OX8 4JW.  
Yours sincerely  
JOHN COBORN (Chairman).



## THE WATER POPPY

by Philip Swindells

THE WATER POPPY, *Hydrocleys comersoni*, or as it is sometimes known, *Limnocharis humboldtii*, is an exceptionally fine but much neglected aquatic plant. Although only hardy in very sheltered districts it is a useful summer inhabitant of the shallows of the outdoor pool, thrusting up handsome golden tri-petalled blooms amidst deep green fleshy floating foliage. The individual blossoms last scarcely a day, but are replaced continuously from April until September. As autumn approaches, cuttings or runners with a few adventitious roots showing, can be removed and potted in a good soil-based compost and then stood in the greenhouse or other light frost-free building in a pail of water until the following spring.

Being a native of Brazil, the water poppy obviously gives of its best when provided with a little heat, and while it is possible to grow it in an aquarium, it is not the ideal addition to the community tank. Apart from preferring water no more than six inches deep it carries its blooms well above the surface where they may interfere with the routine maintenance of the tank. I much prefer to see it grown in a sink or small tub in the greenhouse and treated as an individual rather than one component of an aquatic environment. Indeed, one of the best examples I ever saw of *Hydrocleys* was in an old soft water tank in an elderly propagating house at the Cambridge Botanic Garden where it thrived with little or no attention, blooming more prolifically than the specially cultivated specimens in the display house.

# HOME AQUARIUM COMPETITION

by M. Harvey

EVERY YEAR, since the Godalming and District Aquarist Club was formed, we have held a Home Aquarium Competition. A lot of members who do not like showing fish can partake because no disturbance is involved.

Up until this year, the competition took place during the month of September which gave members a chance to plan their aquariums throughout the year. Most, however, preferred to leave it until the last few hectic weeks to completely replan and layout their tanks. This was the spur that most people needed as aquariums, once set up, usually remain that way until disaster or home-moving takes place. Many local fish shops have reported a big increase in plant sales during this period, and members suddenly seem reluctant to ask others into their homes.

Two of us acted as judges, and we visited each home on a prearranged date. This took quite a bit of planning, because although the club is called Godalming, the area concerned is over twenty miles across. Some evenings, where several members lived close together, we would visit as many as we could cram in and be up the rest of the night suffering from endless cups of coffee. We judged the exhibits using the federation type of pointing, ie. fish, plants, rockwork, technique and design. Most years we had an unenviable task of sorting out the first few places. Just for our own interest we kept a check on our mileage one year, and found that we had covered nearly three hundred miles. It was hard work but very rewarding, and we got many new ideas for our own use.

When the big evening arrived at the club, and the results and the trophies were given out, something was missing. Apart from the prizewinners, to the other participants and members it meant nothing. True, the first few years were exciting but then it started to lag, and as all committee members know, things must not be allowed to lag. Telling the club that Terry's tank was beautifully planted, and that Len had lovely driftwood in his, was like trying to describe the Taj Mahal to one's grandmother.

So we decided, that if we couldn't take the club round on a viewing expedition, then we would have to bring the aquariums to the club. What better way than slide photography? Glenn Harvey, who is a very good photographer had, however, never photographed fish or aquariums. But one test film, with carefully noted data, soon solved that problem and everybody started to get keen again. We worked

on the old idea of getting it all cleared up in one month, and away we went.

To give a good showing of each tank we took four slides, one of the overall setup, one of a special feature such as rockwork or some nice planting, and two more of the better fish and plants. The overall slide was taken from a tripod, with a quarter to half a second exposure filling the whole slide with the aquarium front. The others were taken freehand with a close up lens and a flash. We found that we got better results by having the flashgun independent from the camera, just connected by the cable. I had the job of holding the flash and trying to follow the camera wherever it went. These last slides sometimes meant a very frustrating evening because a community tank, as you know, is never still and a quarter of an inch can be way out of focus. One big red-tailed black shark led us a dance for a couple of hours before we got the first click. Fish-keepers are usually very patient people and we managed in the end.

One evening after a dash home from work (it was always a dash home from work) we photographed four tanks only to realize to our horror as we got in the car that we had double exposed over the film which we had used on the two previous nights. The thought of going over it all again nearly made us give up.

To make sure that everything was fair, we got Roger Paine, from Basingstoke, to come and judge for us. He is a well known prize winner with miniature furnished aquariums and an F.B.A.S. judge, which suited us fine and we were glad that our part was over.

We mentioned to members that they could bring along their families, but we were not prepared for the interest which had been created. Our hall could have been twice as big on the night; we had the biggest crowd since the club was started. Everyone was anxious to see their own works of art on the big screen, and they did look good. To be honest, some looked better than they really were. We ran through four slides from each tank in sequence, and it took nearly two hours. Roger was pointing them as we went along, so as soon as we had finished we knew the results. He also gave comments on each tank, and a little criticism.

The first thing that everyone wanted to know afterwards, was when could they see them again. It will fill another evening sometime, so we are looking forward to another packed house. Other clubs should try this; it would help to fill their programme.



## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 5th of the month preceding the month of publication.

AT the April meeting of the **Thorpe A.S.** members were entertained to an excellent illustrated lecture on the "Water Garden" by David Laughlin of Waverley fish farm who is also a member of the **Dus A.S.** His lecture covered all aspects of coldwater fishkeeping including preparation of garden ponds, and propagation of water lilies. The lecture closed with a brief account of his work at the other trust at Earsham and his preparation of a film set involving otters.

The secretary informed the society that membership was still on the increase and several new members enrolled at the meeting. Results of the monthly table show were as follows: Gouramis and Labyrinths: 1, P. Sparks; 2, C. Pearnley; 3, G. G. Balls. Siamese Fighters: 1 and 3, K. Appleton; 2, M. Otway. Juniors Combined—Fighters, Gouramis and Labyrinths: 1 and 3, J. Norton; 2, D. Hunn.

New members are welcome at regular monthly meetings which are held on the first Wednesday of each month at the Canary Public House, Heaton Estate, Norwich at 8 p.m. All membership enquiries to Trevor Cook telephone Norwich 405176.

THE officials for **Sheaf Valley A.S.** this year are as follows: chairman, F. Toyne; vice-chairman, L. Hattersley; treasurer, H. Darley; show secretary, B. Moore; assistant secretary, D. Golland; social secretary, Mrs. C. Toyne; assistant social secretary, M. Kemp; secretary, Mrs. M. Kemp, 167 Buchanan Road, Parson Cross, Sheffield S5 8AS. Other committee member, J. Barlow.

MEMBERS at the April meeting of **Bristol A.S.** had an interesting session when Mr. V. Cole showed members a biological filter he had made for his pond from plastic tubes joined with T pieces and elbow joints to form a perforated grid. During a discussion on hand spawning led by Mr. S. Lloyd there seemed to be a divergence of view as to whether it is better to obtain the eggs or milk first. A warm welcome was extended to Margaret Dudley and Messrs. Clapp and Herring who had braved one of the coldest nights this winter in order to attend this meeting.

THE **Northern Goldfish and Pondkeepers Society** held their annual general meeting in April and the meeting was extremely well attended. The chairman was pleased to welcome five new members on that day. Officers for this year were elected, and are as follows:—president, W. Ramsden; vice-president, Mrs. A. Buxter; chairman, P. Johnson; vice-chairman, W. Gregory; treasurer, B. Rothwell; secretary, D. Lord; P.R.O. and Journal Editor, Mrs. P. Hodgkinson. Mr. W. Ramsden gave a lecture on culling fry and he brought along several small fish of the type he would cull from his stock.

Meetings are held on the second Sunday of

each month, starting at 2 p.m. at the Bagnist Church Hall, Beaver Road, Didsbury, Manchester. New members are always very welcome.

IN March the first Wednesday in the **Ports-mouth A.S.** calendar incorporated a general meeting devoted almost entirely to a slide lecture given by Mr. M. Sandford of Reigate on the subject of fishes "friends and foes." The quality of the slides could not be surpassed in any way. Quite remarkable was the detail to be seen in an illustration of the argulus or fish leech, to quote an example. Most of the animals which had been photographed were quite small. Of particular note were the smaller predators: like for instance the water beetle, *Colymbetes fuscus*; the larva of an agabus species of water beetle; the backswimmer, *Notonecta glauca*. Not to be outdone were the "live foods" such as the bloodworms (*chironomus*) and mosquito larvae (*culex*).

The second meeting of the month took place on the third Wednesday and the main feature was a talk given by Miss Win Ryder on the setting up of aquaria. It was a splendid demonstration of what should be done and it was of particular guidance to the younger members. During that meeting there was a table show for livebearers which was judged by Mr. Ivor Goddard of Salisbury. The results were as follows:—Class O: 1, D. Forse; 2, E. Binstead; 3, Mrs. S. Whittenham. Class Q: 1, D. Forse; 2 and 3, C. Forse; 4, E. Binstead. Class R: 1, 2, 3 and 4, E. Binstead. Class S: 1, E. Binstead.

There was a special meeting for the junior members on the last Wednesday of the month. Mr. Ian Walker chaired the meeting and the major item for discussion was the August Exhibition after which a quiz was held. There was also a "My Best Fish" table show and the results were as follows:—Best fish and 1, (tropical) Master N. Forse with a male guppy; 2 and 3, Master S. Morris with an opaline gourami and a dwarf gourami; 4, Master N. Forse with a pictus catfish. All the cards in the coldwater section were taken by Master S. Barnes with the following:—1, flounder; 2, gudgeon; 3, loach. Mr. Backham of Peterfield judged the tropical fishes and Mr. Hunt the coldwater.

THERE were 600 entries from thirty societies at the **Scunthorpe Museum Society Aquarist Group** annual open show. The best fish in the show was exhibited by Mr. and Mrs. R. Vernon from Retford.

Results were:—Guppies: 1, S. Harrison (Grimby & Cleethorpe); 2, Mr. and Mrs. Harrison (Sheffield); 3, Mr. and Mrs. Snowden (York). Swordtails: 1, S. Hepworth (Ashby); 2, Mr. and Mrs. Lake (South Humber-side); 3, Mrs. J. Harrison (Grimby & Cleethorpe). Milkies: 1, D. & W. Jordan (South Humber-side); 2, Mr. and Mrs. Welch (York); 3, Mr. Sands (Boston). Platies: 1, Mr. and Mrs. Honnor (Doncaster); 2, Mr. and Mrs. Elliker (Scarborough); 3, Mrs. Bee (Grimby & Cleethorpe). A.O.V. Livebearers: 1, T. Rusfield (Barnsley); 2, M. and Mrs. Caldwell (Scunthorpe Museum); 3, Mr. and Mrs. Tilling (Immingham). Small Barbs: 1, D. Harris (Mexborough); 2, Mr. and Mrs. G. Flint (Doncaster); 3, Mrs. Bee (Grimby & Cleethorpe). Large Barbs: 1, Mr. and Mrs.

Roberts (Doncaster); 2, Mr. and Mrs. Honnor (Doncaster); 3, W. Thorpe (Doncaster). Small Characins: 1, Mr. and Mrs. Hill (Scunthorpe Museum); 2, Mr. and Mrs. Vernon (Retford); 3, Mr. and Mrs. Roberts (Doncaster). Large Characins: 1, Mr. and Mrs. Bradley (Retford); 2, D. Harris (Mexborough); 3, T. Busfield (Barnsley). Dwarf Cichlids: 1 and 3, D. Harris (Mexborough); 2, Mrs. Bee (Grimby & Cleethorpe). Angels: 1, Mr. and Mrs. Hill (Barnsley); 2, Mr. and Mrs. Lees (Doncaster); 3, Mr. and Mrs. Jarman (Barnsley). Rift Valley Cichlids: 1, S. Drayton (Independent); 2, Mrs. Bee (Grimby & Cleethorpe); 3, M. Hollingsworth (Sherwood). A.O.V. Cichlids: 1, Mr. and Mrs. Vernon (Retford); 2, Mrs. Bee (Grimby & Cleethorpe); 3, A. Hodgson (Mexborough). Corydoras: 1, Mr. and Mrs. Binns (Scunthorpe Museum); 2, Mr. and Mrs. Bowles (Scunthorpe Museum); 3, Mr. and Mrs. Campbell (Ashby). A.O.V. Catfish: 1, T. Stanfield (Castleford); 2, P. Gregory (Sherwood); 3, K. Fisher (Sherwood). Loaches: 1, T. Sanderson (Thorne); 2, Mr. and Mrs. Davies (Doncaster); 3, B. Banks (Thorne). Bettas: 1 and 2, Mr. and Mrs. Binns (Scunthorpe Museum); 3, Mr. and Mrs. Honnor (Doncaster). Sharks: 1, Mr. and Mrs. Campbell (Ashby); 2, Mr. and Mrs. Copley (Doncaster); 3, W. Thorpe (Doncaster). Foxes: 1, Mr. and Mrs. Riley (Castleford); 2, T. Sanderson (Thorne); 3, Mr. and Mrs. Honnor (Doncaster). Aphrotonium & Nothobranchius: 1, Miss A. Hollingsworth (Sherwood); 2, B. Slight (Mexborough); 3, E. Rice (Barnsley). A.O.V. Egg-laying Tooth-carp: 1, D. Harris (Mexborough); 2, B. Slight (Mexborough); 3, R. Ranson (Grimby & Cleethorpe). Siamese Fighters: 1, Mrs. S. Richardson (Wyke); 2, Mrs. M. Grey (Wyke); 3, Mr. and Mrs. Lee (Chesterfield). Small Anabantids: 1, Mr. and Mrs. Mason (Scunthorpe Museum); 2, T. Jackson (Sherwood); 3, Mr. and Mrs. Welch (York). Large Anabantids: 1, T. Jackson (Sherwood); 2, Mrs. Bee (Grimby & Cleethorpe); 3, Mr. and Mrs. Mason (Scunthorpe Museum). Danios & Minnows: 1, S. Harrison (Grimby & Cleethorpe); 2, Mr. and Mrs. Lake (South Humber-side); 3, Mr. and Mrs. Goucher (Goole). Rasbora: 1, Mr. and Mrs. Daines (Doncaster); 2, A. Simpson (Barnsley); 3, Mr. and Mrs. Vernon (Retford). Pairs (Livebearers): 1, Mr. and Mrs. Hill (Barnsley); 2, T. Busfield (Barnsley); 3, D. & W. Jordan (South Humber-side). Pairs (Egg-layers): 1, B. Slight (Mexborough); 2, Mr. and Mrs. Bradley (Retford); 3, Mr. and Mrs. Copley (Doncaster). Novice Livebearers: 1, Mr. Davidson (Grimby & Cleethorpe); 2, Mr. and Mrs. Goucher (Goole); 3, Master Busfield (Barnsley). Novice Egg-layer: 1, Miss Bradley (Retford); 2, Mr. Walker (Grimby & Cleethorpe); 3, Mr. Davidson (Grimby & Cleethorpe). Breeders Livebearers (A. & B.): 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Little (Sheffield); 3, Mr. and Mrs. Chester (Retford). Breeders Livebearers (C. & D.): 1, Mr. and Mrs. Chester (Retford); 2, Mr. and Mrs. Hill (Barnsley); 3, S. Harrison (Grimby & Cleethorpe). Breeders Egg-layers (A. & B.): 1, Mr. and Mrs. Bradley (Retford); 2, Mr. and Mrs. Campbell (Ashby); 3, J. Rhodes (Scunthorpe Museum). Breeders Egg-layers (C. & D.): 1, Mr. and Mrs. Copley (Doncaster); 2 and 3, B. Banks (Thorne). Common Goldfish & Comets: 1, K. Chapman (Mexborough); 2, Mr. and Mrs. Waller (Chesterfield); 3, Mr. and Mrs. P. A. Turner (Scunthorpe Museum). Shubunkins: 1, M. Futton (Independent); 2 and 3, B. Craig (Wyke). A.O.V. Coldwater: 1 and 2, D. & W. Jordan (South Humber-side); 3, Mr. and Mrs. Snowden (York). A.O.V. Tropical (Small): 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Lake (South Humber-side); 3, Mr. and Mrs. Elliker (Scarborough). A.O.V. Tropical (Large): 1, Mr. and Mrs. Caldwell (Scunthorpe Museum); 2, G. White (Ashby); 3, A. Fraby (Wyke). A.V. Marine: 1, Mr. and Mrs. Mason (Scunthorpe Museum); 2, A. Hollingsworth (Sherwood); 3, G. Gow (Independent).

MEMBERS were pleased to welcome Mr. B. E. Cureton of Malvern and District A.S. at the April meeting of the **Evesham Fish**

**halamid IN**  
**WHITE SPOT OUT**  
Hillside Aquatics London N12

**Keepers Society.** He gave a very informative talk on "Filtration in the Aquarium."

Although his personal preference leans toward the natural method, involving a very heavy planting of the tank, Mr. Cureton covered all the mechanical systems and managed to mystify his audience by his frequent references to a "protein skimmer." However, this was explained in detail at question time. He also judged the table show and afterwards gave members many useful tips on showing fish. A six-a-side contest was arranged between the two clubs for the May meeting.

Table show results: Barbs: 1 and 2, and shield winner, S. Biddle; 3, G. Johns; 4, Mrs. B. Thornton; Rasboras: 1, Mrs. L. Wright; 2, Miss S. Westmacott. The Society meets on the first Tuesday of every month, at 8.00 p.m. at Church Meeting Rooms, Evesham. Visitors and new members welcomed. Club secretary: Mr. K. R. Baker, 124 Kings Road, Evesham, Worcs.

**THE Association of Midland Goldfish Keepers** have recently enjoyed two very interesting, and informative, talks given by fellow members. The first meeting of the new season was addressed by Mr. A. Roberts, who gave a refresher course on the subject of "Conditioning Goldfish for Breeding." This very able speaker clearly explained how to ensure that the adult fish were free of parasites, the types of food that should be offered, and the conditions necessary to encourage the fish to spawn. The newcomers to the Association, especially the novices, were able to gain a great deal of worthwhile information from this well known goldfish breeder.

The second meeting again proved most informative and enjoyable. Mr. J. Amos gave a talk about his fish, and the construction of a quite large butyl lined pond, which he had installed in his garden—complete with filter—and backed by a colourful rocky with waterfall. The talk was illustrated with a great many slides of excellent quality which invoked a good deal of admiring comment from the members. Both the detailed methods of building the pond, together with that of the methods used to raise his speciality—the Bristol shubunkin—were listened to with careful attention.

Full details of Association of Midland Goldfish Keepers and future meetings, to which all visitors are extended a warm welcome, may be obtained from the secretary, Mrs. Janet Amos, 31 Greenview Drive, Kingsley, Northampton NN2 7LA. Meetings are held near Coventry, at the Foleshill Community Centre, once every two months always on a Sunday afternoon.

**RESULTS of the Billingham Half Moon A.S. Open Show** held in April were as follows: Miniature Aquaria: 1, Kane Family (Half Moon A.S.); 2, Mr. Grenville (Half Moon A.S.); 3, R. Kirkup (Independent); Barbs: 1, P. Haig (Redcar); 2, Mr. and Mrs. Embleton (Novos); 3, J. Page (Half Moon); 4, W. Smith (Redcar). Ba Barbs: 1, Mr. and Mrs. Forbes (Whitby); 2, J. English (Throckley); 3, Mr. and Mrs. Hall (Novos); 4, Mr. and Mrs. Ribside (Novos). Characins: 1, N. Soppet (Houghton); 2, J. Duffel (Redcar); 3, Mr. and Mrs. Hall (Novos); 4, B. Summerscales (Northallerton). Co Characins: 1, M. Thakeray (Stockton); 2, Mr. and Mrs. Hall (Novos); 3, G. Allstopp (Ind.); 4, B. Shackcloth (Half Moon). Cb Characins: 1, Mr. and Mrs. Ribside (Novos); 2 and 3, J. English (Throckley); 4, R. Kirkup (Novos). D Cichlids: 1, M. Newton (Hartlepool); 2, D. Horn (Half Moon); 3, Mr. and Mrs. James (Half Moon); 4, D. Orson (Blyth). Da Angels: 1, Mr. and Mrs. Embleton (Novos); 2, A. Hunt (Half Moon); 3, Mr. and Mrs. James (Half Moon); 4, R. Gledhill (Redcar). Db Cichlids: 1, D. McClurg (Stockton); 2, J. Bowman (Whitby); 3, R. Gledhill (Redcar); 4, J. Middlemast (Ind.). De Hap. Derivatives: 1, R. Asherton (Hartlepool); 2 and 3, C. Enright (South Shields); 4, A. Frame (Northallerton). E. Labyrinth: 1, J. Middlemast (Ind.); 2, Mr. and Mrs. Knibbs (Stockton); 3, J. King (Redcar); 4, J. Blackburn (Ind.). Ea Beta Splendens: 1, Mr. and

Mrs. Embleton (Novos); 2, J. Middlemast (Ind.); 3, D. Knibbs (Stockton); 4, Mr. and Mrs. Knibbs (Stockton). F. E.L.T.C.: 1, D. Horn (Half Moon); 2, G. Eldart (Billingham); 3, E. Harrison (Ind.); 4, C. Robinson (Stanley). G. Tropical Catfish: 1, P. Wright (Sunderland); 2, Mr. and Mrs. Hall (Novos); 3, Campbell Family (M. Pleasant); 4, K. Errington (Redcar). H. Corydoras-Brochis: 1, Mr. and Mrs. Embleton (Novos); 2, Mr. and Mrs. Hall (Novos); 3, J. Thackeray (Stockton); 4, K. Greenley (Half Moon). J. Raibora: 1, Mr. and Mrs. Ribside (Novos); 2, Mr. and Mrs. Hall (Novos); 3, M. Brown (Blyth). K. Middlemas (Ind.); 3, M. Brown (Blyth). L. Middlemas (Ind.); 3, M. Brown (Blyth). M. Mr. and Mrs. Wright (Ind.); 2 and 3, J. Thackeray (Stockton); 4, Lynne Embleton (Novos). L. Loach: 1, J. English (Throckley); 2, B. Robson (Throckley); 3, M. Campbell (M. Pleasant); 4, A. Stevens (Middlebrough). M. A.O.S. Trop. Egglayer: 1, Mr. and Mrs. Knibbs (Stockton); 2, K. Atkinson (Half Moon); 3, D. Readman (Redcar); 4, B. Frost (Stockton). Ma Labee: 1, R. McCartney (Ind.); 2, Mr. and Mrs. Wright (Ind.); 3, J. Page (Half Moon); 4, P. Porter (Ind.). Not Breeding Pairs (Livebearers): 1, C. Nelson (Ind.); 2, A. Clegg (N.G.L.S.); 3 and 4, R. Kirkup (Novos). Nbm Breeding Pairs (Egglayers): 1 and 2, Campbell Family (M. Pleasant); 3, J. Middlemast (Ind.); 4, S. Burgess (Whitby). O. Guppy (Male): 1, J. King (Redcar); 2, A. Clegg (F.G.A.); 3, L. Dodd (B. Auckland); 4, A. Frame (Northallerton). P. Guppy (Female): 1, Mr. and Mrs. Hill (F.G.A.); 2 and 4, P. Fry (Houghton); 3, A. Clegg (F.G.A.). Q. Xiph Heli: 1 and 2, R. Gledhill (Redcar); 3, Mr. and Mrs. Embleton (Novos); 4, J. Athwain (Half Moon). R. Platy: 1, Mr. and Mrs. Johnson (Stockton); 2, M. Bradshaw (Redcar); 3, J. King (Redcar); 4, S. Burgess (Whitby). S. Molly: 1, Campbell Family (M. Pleasant); 2, B. Shackcloth (Half Moon); 3, S. Dodd (B. Auckland); 4, Mr. and Mrs. Johnson (Stockton). T. A.O.S. Livebearer: 1, J. English (Throckley); 2, A. Clegg (N.G.L.S.); 3, P. Wright (Sunderland); 4, Mr. and Mrs. McClurg (Stockton). U. Single Tail Goldfish: 1, P. Fry (Houghton); 2, D. McClurg (Stockton); 3, Mr. and Mrs. Embleton (Novos); 4, A. and J. Bowman (Whitby). V. Twin Tail Goldfish: 1, J. Duffel (Redcar); 2, B. Summerscales (Northallerton). W. A.O.S. Coldwater: 1, J. Whitley (Stockton); 2, Mr. and Mrs. Ribside (Novos); 3, E. Hall (Stanley); 4, D. McClurg (Stockton). Xbm Breeders (Egglayers): 1, B. Robson (Throckley); 2, M. McCartney (Ind.); 3, Mr. and Mrs. Ribside (Novos); 4, J. English (Throckley). Xot Breeders (Livebearers): 1, R. Kirkup (Novos); 2, A. Clegg (N.G.L.S.); 3, B. Shackcloth (Half Moon); 4, W. Gosland (Half Moon). Juniors: 1, Lynne Embleton (Novos); 2, B. Harker (Hartlepool); 3, I. Armstrong (Stockton); 4, D. Raine (Houghton).

There was a total number of 468 entries. The Best Fish in Show was a Red Eyed Xiph Heli entered by R. Gledhill (Redcar).

IT had been an increasingly busy and active twelve months for the Sandgrounders A.S. with a varied programme of films, lectures, slide shows, auctions and table shows at the fortnightly meetings. Together with other activities which included a treasure hunt, open show, stand at the British Aquarists Festival at Belle Vue, inter-society shows and quizzes, Xmas socials etc., the secretary was confident that each of the 107 members had received value for their subscriptions.

The treasurer produced a healthy set of figures in the balance sheet and the show secretary thanked those members who had contributed to the Society winning the F.N.A.S. show league, the only society to have achieved this twice. Vice-chairman C. Evason presented awards to the senior Aquarist of the Year Mrs. E. Stillwell, and to the junior Aquarist of the Year Master M. Rimmer, who also received the Seahorse trophy for overall Aquarist of the Year.

After an interval the election of officers and committee resulted in the following appointments: chairman: G. Waterhouse; vice-chairman: C. Evason; gen. secretary: S. Hooton, 81 Radnor Drive, Southport, tel:

24743 (0764); treasurer: R. Clift; show secretary: B. Baldwin; assistant show secretary: G. Harvey; P.R.O.: J. Bate; committee: R. Iddon, K. Howard, J. Tansley; auditor: Mrs. K. Howard.

The Society look forward to another interesting year of fishkeeping and invite fellow aquarists to join them on alternate Thursday evenings at the Mount Pleasant Hotel, Manchester Road, Southport. Further details of membership and society meetings are available from the secretary.

**OPEN Show results of the Kettering A.S.** were as follows: Class B: 1, A. & M. Crew (Wellingborough); 2, J. Sievwright (Corby); 3, D. Cruikshank (Ealing); 4, R. Elliott (Corby). Class C: 1, 2 and 3, R. Elliott (Corby); 4, J. Sievwright (Corby). Class D: 1, R. Elliott (Corby); 2, H. Laws (Kings Lynn); 3, J. & P. Patching (Wellingborough); 4, P. Eady (Leicester New Park). Class DA: 1, A. & M. Crew (Wellingborough); 2, R. Elliott (Corby). Class DB (FBAS Championship Class): 1, R. Elliott (Corby); 2, A. & M. Crew (Wellingborough); 3, M. & B. Coe (Wellingborough); 4, R. Vickers (Kettering). Class DC: 1, H. Laws (Kings Lynn); 2, N. Campbell (Corby); 3, J. & P. Patching (Wellingborough); 4, G. Oiler (Kings Lynn). Class E: 1, J. Rule (Fishkeepers); 2, G. Wooley (Corby); 3, I. Lloyd (Kettering); 4, D. Baker (Wellingborough). Class EA: 1, M. & B. Coe (Wellingborough); 2, A. Adamson (Kettering); 3, R. Elliott (Corby); 4, N. Boot (Leicester). Class F: 1 and 4, J. Sievwright (Corby); 2, R. Sproun (Kettering); 3, A. & M. Crew (Wellingborough). Class G: 1, J. Sievwright (Corby); 2, P. Eady (Leicester New Park); 3 and 4, N. Campbell (Corby). Class H: 1 and 2, T. Cruikshank (Ealing); 3, J. Short (Corby); 4, L. Godwin (Leicester New Park). Class I: 1, A. & M. Crew (Wellingborough); 2, J. Denston (Wednesfield); 3, L. Godwin (Leicester New Park); 4, T. Cruikshank (Ealing). Class K: 1, J. Savi (Kettering); 2 and 4, R. Elliott (Corby); 3, T. Cruikshank (Ealing). Class L: 1 and 3, R. Elliott (Corby); 2, P. Hand (Corby); 4, S. Twynham (Rugby). Class M: 1 and 2, A. & M. Crew (Wellingborough); 3, R. Elliott (Corby); 4, D. Pepperel (Corby). Class Nb.m.: 1, A. & M. Crew (Wellingborough); 2, R. Elliott (Corby); 3, I. Lloyd (Kettering); 4, P. Colson (Kettering). Class NNO-1: 1, D. Cruikshank (Ealing); 2, 3 and 4, R. Wilson (Corby). Class O: 1, D. Pepperel (Corby); 2, M. Evans (Leicester); 3, J. Rule (Fishkeepers); 4, N. Boot (Leicester). Class Q: 1, R. Wilson (Corby); 2, L. Godwin (Leicester New Park); 3, P. Hand (Corby); 4, N. Boot (Leicester). Class R: 1, A. & M. Crew (Wellingborough); 2, R. Vickers (Kettering); 3, R. Wilson (Corby); 4, L. Godwin (Leicester New Park). Class S: 1, A. & M. Crew (Wellingborough); 2, J. Evans (Leicester); 3, M. Evans (Leicester); 4, R. Wilson (Corby). Class T: 1, D. Cruikshank (Ealing); 2, A. Onslow (Loughborough); 3 and 4, R. Wilson (Corby). Class U: 1 and 3, J. Amos (Midland Goldfish); 2 and 4, S. Brown (Bethnal Green). Class V: 1, 2 and 4, J. Amos (Midland Goldfish); 3, C. McAllister (Corby). Class W: 1, A. & M. Crew (Wellingborough); 2 and 3, S. Brown (Bethnal Green); 4, J. Short (Corby). Class XB-M: 1, R. Elliott (Corby); 2, A. Love (Corby); 3 and 4, J. Sievwright (Corby). Class X.O.T.: 1 and 2, R. Wilson (Corby).

**MEMBERS of the Bradford and District A.S.** at the April meeting had the pleasure of listening to a very interesting and informative talk on foods given by Mr. Ian Bingham. This is a new talk which Mr. Bingham has compiled himself and it is felt that other societies would find it very enlightening.

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Along with a new booklet which Mr. Bingham has compiled, his talk is aided by the large selection of live foods which he brings along including desert locusts which he breeds himself.

**THE Kettering A.S.** held their first monthly meeting after the Open Show in April and gained eight new members from the response to the Show.

The society was entertained by Mr. B. Chandler of Thringston Aquatics with a very interesting and entertaining lecture on Malawi and all Rift Valley Cichlids. Table show result for Class D cichlids was as follows: 1, R. Vickers; 2, P. Hart; 3, D. McAllister, A.O.V.; 1, G. Salvi; 2, R. Wilson; 3, D. McAllister.

The society meet at the Avenue Hotel, Russell Street, Kettering at 8 p.m.

**THERE** were well over four hundred entries from twenty-two societies at the **Nelson A.S.** open show. The results were—Section A (Livebearers)—Guppies: 1, N. Stevenson (Ostram) (Section Winner); 2 and 3, D. Conway (Darwen). Swordtails: 1, D. Garstang (Longridge); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Goddard (Macclesfield). Mollies: 1, Mr. and Mrs. Iddon (Sandgrounders); 2, N. & M. Rimmer (Sandgrounders); 3, R. I. Payne (Merseyside). Platies: 1 and 3, B. & B. Durham (Longridge); 2, B. W. Carter (St. Helens). A.O.V.: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, B. & B. Durham (Longridge); 3, Mr. and Mrs. D. Hanns (Nelson). Section B (Anabantids)—Fighting: 1, J. Haley (Darwen); 2, Mr. and Mrs. Ham (Lytham); 3, D. Thomlinson (Macclesfield). Small: 1, A. Lyons (Longridge) (Section Winner); 2, Mr. and Mrs. Underwood (Southport); 3, Mr. and Mrs. Baldwin (Sandgrounders). Large: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. Godgeen (Darwen); 3, A. Lyons (Longridge). Section C (Characins)—Small: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2 and 3, K. Thompson (Merseyside). Large: 1 and 2, Mr. and Mrs. Walsh (Blackburn) (Section Winner); 3, Mr. and Mrs. Underwood (Southport). Section D (Scavengers)—Cory & Brochis: 1, B. W. Carter (St. Helens); 2, Mr. Hodge (Southport); 3, Mr. and Mrs. Muckle (Runcorn). A.O.V. Cat: 1, Misses P. & S. Taylor (Atlantis) (Section Winner); 2, Mr. and Mrs. Underwood (Southport); 3, N. Wallbank (Morecambe Bay). Loaches: 1, R. I. Payne (Merseyside); 2, Mr. and Mrs. Underwood (Southport); 3, Mr. and Mrs. Ham (Lytham). Sharks & Foxes: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mr. Hodge (Southport); 3, V. Baldwin (Nelson). Section E (Toothcarps)—Rasbora: 1, Mr. and Mrs. Muckle (Runcorn) (Section Winner); 2, J. Corbett (Merseyside); 3, S. Tomlinson (Macclesfield). Danios & Minnows: 1, Mr. and Mrs. Underwood (Southport); 2, J. Haley (Darwen); 3, Miss S. Goddard (Macclesfield). Toothcarps: 1, N. & M. Rimmer (Sandgrounders); 2, R. I. Payne (Merseyside); 3, J. & N. Bradshaw (Longridge). Section F (Barbs)—Small: 1, B. W. Carter (St. Helens); 2, R. A. Johnstone (Hyde); 3, Mr. and Mrs. Mulla (Merseyside). Large: 1 and 2, Mr. and Mrs. Baldwin (Sandgrounders) (Section Winner); 3, B. & B. Durham (Longridge). Section G (Cichlids)—Angels: 1, N. Stevenson (Ostram); 2, Mr. and Mrs. Aspinall (Sandgrounders); 3, Mr. and Mrs. Muckle (Runcorn). Dwarf: 1, N. Stevenson (Ostram); 2, J. Corbett (Merseyside); 3, J. & N. Bradshaw (Longridge). Rift Valley: 1, Mr. and Mrs. Iddon (Sandgrounders). A.O.V.: 1, Mr. and Mrs. Underwood (Southport) (Section Winner); 2, Mr. and Mrs. Aspinall

(Sandgrounders); 3, Mrs. P. A. Taylor (Atlantis). Section H (A.O.V.)—Tropical: 1, P. & H. Batchelor (Loyne) (Section Winner); 2 and 3, P. Yates (Blackburn). Section I (Coldwater)—Common: 1, Mr. Dingley (Heywood). Single Tail: 1, S. Foote (Accrington); 2 and 3, Mr. Dingley (Heywood). Twin Tail: 1, C. Wallbank (Accrington) (Section Winner); 2, B. Hasworth (Accrington); 3, S. Foote (Accrington). A.O.V.: 1, Mr. and Mrs. Underwood (Southport); 2, Mr. and Mrs. Heywood (Sandgrounders); 3, S. Foote (Accrington). Section J (Pairs)—Livebearers: 1, B. & B. Durham (Longridge); 2, K. Thompson (Merseyside); 3, Mr. and Mrs. Goddard (Macclesfield). Egglayers: 1 and 2, K. Thompson (Merseyside) (Section Winner); 3, Mr. and Mrs. Tanley (Sandgrounders). Section K (Breeders)—Livebearers (1-10): 1, B. & B. Durham (Longridge); 2, Mr. and Mrs. Goddard (Macclesfield); 3, C. E. Roll (Independent). Section K (Breeders)—Egglayers (1-10): 1, J. Corbett (Merseyside) (Section Winner); 2, D. Hull (Oldham); 3, W. Hays (Loyne). Section L (Juniors)—Livebearers: 1 and 2, D. Garstang (Longridge); 3, Miss Debbie Baker (Sandgrounders). Egglayers: 1, M. B. Pownall (Independent) (Section Winner); 2, M. Cummins (Merseyside); 3, D. Tomlinson (Macclesfield). Section M (Ladies A.V.): 1, A. Aldred (Hyde) (Section Winner); 2, Mrs. Hodge (Southport); 3, Mrs. Muckle (Runcorn). Best Fish in the Show was a Large Catfish exhibited by Misses P. & S. Taylor from Atlantis with 76 points.

**THE** winning ticket numbers in the **Goole and District A.S.** Spring Draw were as follows: 3800, 3820, 2231, 1674, 4954, 3152, 4493, 3271, 0940, 0885, 0303, 3274, 3406, 2032, 4347, 4205, 2533.

**THE** Newcastle Guppy & Livebearer Society now have a slide tape lecture, about Livebearers, available for hire. The hiring charge is £4.00. However, if a Society has a corresponding member of the N.G.L.S. among their members, the programme can be ordered by him/her at a reduced cost of £2.50. Any Society interested in obtaining the programme should contact—Mr. R. Hill, 45, (Bk) Deptford Terrace, Sunderland, Tyne & Wear SR4 6DD.

Another project that the N.G.L.S. is working on at present is the publication of an Information Booklet, mainly concerned with the A.O.S. species, giving details of care and maintenance, breeding etc. The booklet should be available early in July and anyone who wishes to receive a copy should send 35 pence plus a large (9 in. x 7 in.) stamped, addressed envelope to: Mr. J. English, The Cottage, Henderson Filters, Throckley, Newcastle upon Tyne.

**THE** York and District A.S. Open Show results 1978—Guppies: 1, M. R. Elstob (Bridlington); 2, P. Fry (Tyne Tees); 3, S. Harrison (Grimsby & Cleethorpes). Platies: 1, Mrs. Bee (Grimsby & Cleethorpes); 2, Mr. and Mrs. Chadwick (Castleford); 3, Mr. and Mrs. Riley (Castleford). Swords: 1, S. D. Harrison (Grimsby & Cleethorpes); 2, B. Smith (Aireborough); 3, M. Jordan (Bridlington). A.O.V.: 1, D. W. Jordan (S. Humberside); 2, T. Smith (Bridlington); 3, Mr. and Mrs. D. Willey (Scarborough). A.O.V. Livebearer: 1, T. Smith (Bridlington); 2, Mr. Jacklin (S. Humberside); 3, Mr. Blundell (Doncaster). Small Characins: 1, Mr. and Mrs. Lake (S. Humberside); 2, D. Harris (Mexborough); 3, Mr. and Mrs. Kemp (Sheaf Valley). Large Characins: 1, M. Price (Castleford); 2, Mr. and Mrs. Bradley (Retford); 3, Mr. B. Slight (Mexborough). Rasbora (A): 1, Mr. and Mrs. Vernon (Retford); 2, Mr. and Mrs. Danes (Doncaster); 3, Mr. and Mrs. Lake (S. Humberside). Danios & Minnows (B): 1, Mr. and Mrs. Lake (S. Humberside); 2, S. J. Harrison (Grimsby & Cleethorpes); 3, I. Duncan (Hull). Small Barbs: 1, M. Price (Castleford); 2, Mr. and Mrs. Reibridger (Tyne Tees); 3, Mr. and Mrs. Kemp (Sheaf Valley). Large Barbs: 1, M. Jordan (Bridlington); 2, Mr. and Mrs. Roberts (Doncaster); 3, I. Taylor (Bridlington). Dwarf Cichlids: 1, D. Harris (Mexborough); 2, R. Gledhill (Redcar); 3, G. Wrizzlesworth

(Barnsley). Large Cichlids: 1, Mr. and Mrs. Vernon (Retford) (Best Fish in show); 2, Pete and Sylvia (Bridlington); 3, Mrs. Bee (Grimsby & Cleethorpes). Rift Valley Cichlids: 1, I. Taylor (Bridlington); 2, M. Price (Castleford); 3, Mr. Bellard (Hull). Angels: 1, A. & P. Barker (York); 2, Mr. and Mrs. Jarman (Barnsley); 3, A. Frisby (Wke). Fighters: 1, Mrs. Anderson (Wke); 2, Master S. Jarman (Barnsley); 3, G. Mortimer (Bridlington). Small Anabantids: 1, A. Shaw (York); 2, Mr. and Mrs. J. Riley (Castleford); 3, W. Sowersby (Scarborough). Large Anabantids: 1, Mrs. Bee (Grimsby & Cleethorpes); 2, G. Wrizzlesworth (Barnsley); 3, D. Harris (Mexborough). Toothcarps Top (A): 1, Mr. Harrison (Independent); 2, E. & A. M. Rice (Barnsley); 3, Mr. and Mrs. Tindall (York). Bottom (B): 1, B. Slight (Mexborough); 2, Mr. and Mrs. Tindall (York); 3, Mrs. Bee (Grimsby & Cleethorpes). Loaches & Bonas: 1, T. Sanderson (Thorne); 2, F. Coxon (Grimsby & Cleethorpes); 3, R. Gledhill (Redcar). Sharks & Foxes: 1, H. Thorpe (Doncaster); 2, Mr. and Mrs. Drury (S. Humberside); 3, A. Shaw (York). Corydoras (A): 1, T. Smith (Bridlington); 2, Mr. and Mrs. Roberts (Doncaster); 3, Mr. and Mrs. Copley (Doncaster). Brochis (B): 1, Mr. and Mrs. K. Welsh (York); 2, T. Smith (Bridlington); 3, S. Harrison (Grimsby & Cleethorpes). Catfish Naked (A): 1, G. Alsopp (Independent); 2, H. Thorpe (Doncaster); 3, Mr. and Mrs. K. Welsh (York). Armoured (B): 1, P. Gregory (Sherwood); 2, Mr. and Mrs. J. Riley (Castleford); 3, Mr. and Mrs. K. Welsh (York). Pairs (Egglayers): 1, Mr. and Mrs. Copley (Doncaster); 2, B. Slight (Mexborough); 3, A. Piggott (Grimsby & Cleethorpes). Pairs (Livebearers): 1, Mr. and Mrs. Lake (S. Humberside); 2, D. W. Jordan (S. Humberside); 3, Mr. and Mrs. Copley (Doncaster). A.O.V. Tropical: 1, F. Napier (South Shields); 2, Pete and Sylvia (Bridlington); 3, Mr. Blundell (Doncaster). Junior A.V.: 1, Master M. Collier (Goole); 2, Master S. Wood (Bridlington); 3, Miss D. Lees (Doncaster). Breeders Livebearers (A & B): 1, Mr. and Mrs. Copley (Doncaster); 2, W. Sowersby (Scarborough); 3, T. Boothfield (Barnsley). Breeders Livebearers (C & D): 1, Mr. and Mrs. Chester (Retford); 2, M. Walker (Swillington); 3, Mr. Blundell (Doncaster). Breeders Egglayers (A): 1, P. Griffiths (Mexborough); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. Kilvington (Doncaster). Breeders Egglayers (B): 1, B. Slight (Mexborough); 2, D. Barrett (Thorne); 3, Mrs. Frame (Northallerton). Breeders Egglayers (C): 1, Mr. and Mrs. Waller (Chesterfield); 2, Mr. and Mrs. Bradley (Retford); 3, Mr. Kilvington (Doncaster). Breeders Egglayers (D): 1, Mr. and Mrs. Copley (Doncaster) (Best Exhibit in Show); 2, D. Barrett (Thorne); 3, B. Banks (Thorne). Common Goldfish & Comets: 1, K. Chapman (Mexborough); 2 and 3, Mr. and Mrs. Waller (Chesterfield). Fancy Goldfish: 1, F. Burrows (Hull); 2, K. Trulove (Bridlington); 3, Mr. and Mrs. England (Barnsley). A.O.V. Coldwater: 1, K. & M. Wood (Bridlington); 2, Mr. and Mrs. Snowden (York); 3, Mr. and Mrs. Tindall (York). Best Fish in Show: Mr. and Mrs. Vernon (Retford). Best Exhibit: Mr. and Mrs. Copley (Doncaster).

**AT** the New Forest A.S. April meeting the main item was an Aquarists Quiz formulated and run by junior members. Those present being split into two equal teams, so as to cause a little friendly rivalry! The questions had been well chosen, including some latin names of fish, etc. At the close of the meeting the juniors were applauded for the production of such an excellent quiz. Table show results were as follows—Barbs: 1, H. Travers; 2 and 3, T. Mathews; 4, R. Menhennet. Characins: 1 and 3, R. Travers. Fighters: 1, P. Harmon; 2, T. Mathews.

**OPEN** Show results of the **Sheffield & District A.S.** were—Guppies: 1, Mr. and Mrs. J. Riley (Castleford); 2, Mr. and Mrs. Honnor (Doncaster); 3, D. Bradbrook (Tower). Platies: 1, Mr. and Mrs. Chadwick (Castleford); 2, A. Piggott (Grimsby & Cleethorpes); 3, Mr. and Mrs. Jenkins (Sheffield & District). Swordtails: 1, Mr. and Mrs. Lake (South

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Humberide); 2, Mrs. J. Harrison (Grimsby & Cleethorpes); 3, J. Sykes (David Brown). Mollies: 1, D. & W. Jordan (South Humberide); 2, M. Price (Castleford); 3, Jackson Brothers (Sherwood). A.O.V. Livebearers: 1, A. Clayton (Immingham); 2, T. Busfield (Barnsley); 3, Mrs. D. Cruikshank (Baling). Small Characins: 1, Mr. and Mrs. Vernon (Retford); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. and Mrs. Lake (South Humberide). Large Characins: 1, M. Price (Castleford); 2, Mr. and Mrs. Bradley (Retford); 3, R. & S. Cherryholme (Barnsley). Dwarf cichlids: 1, D. Harris (Mexborough); 2, Mr. and Mrs. Stanton (Sheffield & District); 3, Mr. J. Wigglesworth (Barnsley). Large Cichlids: 1, Mr. and Mrs. Vernon (Retford); 2, Mr. Hodgson (Mexborough); 3, R. & S. Cherryholme (Barnsley). Rift Valley Cichlids: 1, M. A. Hollingsworth (Sherwood); 2, Mr. and Mrs. Fletcher (Doncaster); 3, Jackson Brothers (Sherwood). Angels: 1, Mr. and Mrs. Jarman (Barnsley); 2, Mr. and Mrs. Hill (Barnsley); 3, A. P. Barker (York & District). Small Barbs: 1, John Mellors (Workop); 2, B. Sleight (Mexborough); 3, Mr. and Mrs. Flint (Doncaster). Large Barbs: 1, Mr. and Mrs. Kemp (Sheaf Valley); 2, H. Thorpe (Doncaster); 3, Mr. and Mrs. Roberts (Doncaster). Toothcarps Aphysomem: 1, Miss Hollingsworth (Sherwood); 2, B. Sleight (Mexborough); 3, Mrs. K. Bradbrook (Lower). Toothcarps A.O.V.: 1, J. Sutcliffe (B.K.A.); 2, B. Sleight (Mexborough); 3, K. Wall (Don Valley). Sharks: 1, H. Thorpe (Doncaster); 2, A. Piggott (Grimsby & Cleethorpes); 3, B. Sleight (Mexborough). Foxes: 1, Mr. and Mrs. Stanton (Sheffield & District); 2, Mr. and Mrs. Hopkinson (Doncaster); 3, Mr. and Mrs. Honnor (Doncaster). Fighters: 1, Mr. and Mrs. Lee (Chesterfield); 2, Mr. and Mrs. Gray (Wyke). Small Anabantids: 1, J. & M. Freer (Swillington); 2, Mr. and Mrs. Harrison (Sheffield & District); 3, Mr. and Mrs. Kemp (Sheaf Valley). Large Anabantids: 1, Mr. and Mrs. Copley (Doncaster); 2, A. P. Barker (York & District); 3, F. Wilson (Grimsby & Cleethorpes). Danios & Minnows: 1, Mr. and Mrs. Lake (South Humberide); 2, Mrs. J. Harrison (Grimsby & Cleethorpes); 3, S. Harrison (Grimsby & Cleethorpes). Rasboras: 1, A. Simpson (Barnsley); 2, Mr. and Mrs. Vernon (Retford); 3, A. Piggott (Grimsby & Cleethorpes). Pairs Livebearers: 1, A. Clayton (Immingham); 2, Mrs. D. Cruikshank (Baling); 3, M. Price (Castleford). Pairs Egglayers: 1, Mr. Higginbottom (Sheaf Valley); 2, T. A. Cruikshank (Baling); 3, B. Banks (Thorne). Breeders Livebearers (A): 1, Mr. and Mrs. Little (Sheffield & District); 2, A. Piggott (Grimsby & Cleethorpes); 3, Mr. and Mrs. Hopkinson (Darfield). Breeders Livebearers (B): 1, Mr. and Mrs. Hopkinson (Doncaster); 2, Mr. and Mrs. Kivington (Doncaster). Breeders Livebearers (C): 1, T. Busfield (Barnsley). Breeders Livebearers (D): 1, T. Busfield (Barnsley); 2, S. Harrison (Grimsby & Cleethorpes); 3, Mr. and Mrs. Hill (Barnsley). Breeders Egglayers (A): 1, P. Griffiths (Mexborough); 2, Mr. and Mrs. Kivington (Doncaster); 3, Mr. and Mrs. Honnor (Doncaster). Breeders Egglayers (B): 1, Mr. Barrett (Thorne); 2, P. Griffiths (Mexborough). Breeders Egglayers (C): 1, Mr. and Mrs. Sidelbottom (Sheffield & District); 2, Mr. and Mrs. Waller (Chesterfield); 3, Mr. and Mrs. Bradley (Retford). Breeders Egglayers (D): 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Bradshaw (Sheaf Valley); 3, H. Thorpe (Doncaster). Corydoras & Brochis: 1, T. A. Cruikshank (Baling); 2, M. Price (Castleford); 3, Mr. and Mrs. Daines (Doncaster). A.O.V. Cats: 1, P. Gregory (Sherwood); 2, T. Stansfield (Castleford); 3, Mr. and Mrs. Harrison (Sheffield & District). Leaches: 1, Mr. and Mrs. Daines (Doncaster); 2, Mr. and Mrs. Honnor (Doncaster); 3, C. & J. Barlow (Sheaf Valley). A.O.V. Tropical: 1, A. Friaby (Wyke); 2, Mr. and Mrs. Walsh (Blackburn); 3, P. Yates (Blackburn). Goldfish & Shubunkins: 1, Mr. Chapman (Mexborough); 2, K. Ward (Mexborough); 3, Mr. and Mrs. Chadwick (Castleford). Fancy Goldfish: 1, Mr. and Mrs. Hopkinson (Darfield). A.O.V. Coldwater: 1, Mr. and Mrs. Roberts (Doncaster); 2, and 3, Mr. and Mrs. Snowden (York & District).

Plants: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. and Mrs. Kivington (Doncaster); 3, Mr. and Mrs. Roberts (Doncaster). Marines: 1, M. A. Hollingsworth (Sherwood); 2, Mr. and Mrs. White (Sheffield & District). Total number of entries: 1,571. Best in Show: P. Gregory from Sherwood Society.

MARCH was an interesting month for the Hoylake A.S. At the first meeting there was a slide-lecture on General Fishkeeping given by the Society president, Mr. Alan Bland, and the second gathering was the annual general meeting when the following were elected: chairman, D. Morris; vice-chairman, T. Jones; treasurer, D. Neave; secretary, G. Robinson; show secretary, D. Laking; committee: M. Green, B. Cowan, L. McCullough. The Society has moved to a new venue, the 'Coach and Horses', Moreton. Meetings are held on the second and fourth Tuesdays of the month at 8 p.m.

THE Dow Corning A.S. has been in existence for about four years and caters for both cold-water and tropical fishes. The club meets on the first Wednesday of every month, when a small table show is held. Results of the meeting held in April were as follows:—Coldwater section: 1 and 3, E. Rice; 2, A. Parker. Danios & W.C.M.M.: 1, C. Barnsley; 2, A. Parker; 3, D. Potter. Knockout: 1, F. Markez; 2, D. Parker; 3, S. Barnsley. All visitors are welcome, and in the first place should contact S. A. Jenkins, 43 Norwood Crescent, Little Coldbrook, Barry, Glamorgan.

A TALK was given at the April meeting of the Nailsea & District A.S. by Mr. D. Kenwood on 'Showing Fish'. This was followed by a demonstration of all-glass tank construction by Mr. W. Holland, the tank constructed was of the type used for showing fish but proved very instructive in the techniques of making all-glass tanks and cutting glass. Also held was the first of the table shows, the results being:—Guppy (open): 1, C. Brewer; 2 and 3, M. Ellick. (Novice): 1 and 2, C. Brewer. Platy (open): 1, C. Brewer; 2 and 3, D. Kenwood. (Novice): 1, C. Brewer. The results of the Home Furnished Tank competition were: 1, D. Godfrey; 2, I. Dibble; 3, P. Fitchett.

RESULTS of the Midland Aquarist League inter-society show in April were:—A.V. Anabantid: 1 and 3, C. & M. Chambelain (Leamington & D.A.S.); 2, Mr. and Mrs. Underwood (Unit '59'); 4, T.S.F.N. (Coventry Pool & A.S.). A.V. Barb: 1, Mr. and Mrs. Underwood (Unit '59'); 2, J. Booth (Loughborough & D.A.S.); 3, B. Chittenden (Leamington & D.A.S.); 4, G. Nesbit (Nuneaton A.S.). Livebearer Pairs: 1, 3 and 4, Mr. and Mrs. Underwood (Unit '59'); 2, B. Pyle (Leamington & D.A.S.). A.V. Loach & Bots: 1, J. Booth (Best in Show) (Loughborough & D.A.S.); 2, G. Howe (Loughborough & D.A.S.); 3, G. Nesbit (Nuneaton A.S.); 4, T.S.F.N. (Coventry Pool & A.S.). Positions after the first of the four yearly shows: 1, Unit '59' (30 pts); 2, Leamington & D.A.S. (27 pts); 3, Loughborough & D.A.S. (27 pts); 4, Nuneaton A.S. (19 pts); 5, Coventry Pool & A.S. (18 pts); 6, Rugby Fishkeepers (8 pts). Individual leaders: 1, Mr. and Mrs. Underwood (Unit '59'), 14 pts; 2, J. Booth (Loughborough), 8 pts; 3, C. & M. Chambelain (Leamington), 6 pts.

IN April the Bristol Tropical Fish Club held their annual open show. The results being as follows: Best Exhibit in Show and Aquarist Gold Pin: C. M. Howe (Newbury). Highest individual points: C. & J. Richards (Sudbury) 22 points. Highest pointed Society: Newbury A.S., 32 points. Fighters: 1, R. J. Townsend; 2, C. & J. Richards; 3, W. Burton; 4, A. Reed. Labyrinth: 1, J. V. Walton; 2, Mrs. M. Netherell; 3, A. V. Reed; 4, C. & J. Richards. Barbs: 1, P. Cripps; 2, D. Kenwood; 3, M. Strange; 4, T. A. Dowell. Hemm. & Hyps.: 1, P. Burton; 2 and 3, C. & J. Richards; 4, D. Williams. A.O.V. Characins: 1, P. & Y. Watts; 2, T. Burvill; 3, N. Cox; 4, Mrs. M. Netherell. Angels & Discus: 1, P. R. Fitchett; 2, P. Cripps; 3, W. Holland. Dwarf Cichlids: 1, J. Gower; 2, D. Hutchinson;

3, C. & J. Richards; 4, Mrs. M. C. Graham. Rift Valley Cichlids: 1, M. Thomas; 2, T. Johnson; 3, Miss K. Johnson; 4, A. Chaplin. A.O.V. Cichlids: 1, Mrs. M. Netherell; 2 and 3, P. Fitchett; 4, I. Sellick. Corydoras & Brochis: 1 and 3, Mrs. M. Netherell; 2, A. Howard; 4, P. & Y. Watts. A.O.V. Catfish: 1, 2 and 4, J. V. Walton; 3, C. & J. Richards. Rasboras, Danios & Minnows: 1, R. J. Townsend; 2, T. Burvill; 3, B. Witteridge; 4, J. Hankins. Sharks, Loaches, Botas & Eels: 1, A. Chaplin; 2, P. Martin; 3, D. Williams; 4, D. & R. Clark. Mollies: 1, D. & R. Clark; 2, A. Chaplin; 3, P. Burton; 4, S. Manuel. Swordtails: 1, P. Willis; 2, W. Holland; 3, A. Howard; 4, A. P. Parsons. Platies: 1, C. M. Howe; 2, P. Willis; 3, L. Littleton; 4, R. L. Mennhennet. Guppies (male): 1, J. Hodges; 2, A. V. Reed; 3, D. Hutchinson; 4, N. Wallace. Guppies (female): 1, C. & J. Richards; 2, A. V. Reed; 3, S. Richards; 4, B. Newman. Killifish: 1, G. A. Leonard; 2, P. Burton; 3, B. Witteridge; 4, Mrs. B. Sellick. A.O.V. Tropical: 1, C. M. Howe; 2, N. Cox; 3, S. Manuel; 4, C. & J. Richards. Breeders Egglayers: 1, M. Strange; 2, R. J. Townsend; 3, M. Thomas; 4, J. V. Walton. Breeders Livebearers: 1, I. Littleton; 2, R. J. Townsend; 3, A. Howard; 4, P. Burton. A.V. Sexed Pairs: 1, C. & J. Richards; 2, C. M. Howe; 3 and 4, A. Howard. Special Award for Best Cichlid in Show, presented by the British Cichlid Association was won by M. Thomas, (Rhonda).

AT the April meeting of the Mid-Sussex A.S. the Chairman, Mr. N. Short, welcomed five new members to the club and went on to thank members for support received at the Leisure '78 exhibition held recently and asked for help for the society's stand at the Dolphin Fair. The social activities within the society are picking up again with a Social Evening which was held at 31 Park Road, Burgess Hill in May and a disco dance at the Queens Hall, Cuckfield to be held on 24th June. Club meetings will be held at the Fox and Hounds, Haywards Heath from Thursday 8th June.

On the show scene the society visited Brighton and Southern A.S. for the first leg of the annual 'Over the Downs' interclub contest in April. The main part of the evening was taken up by a slide show on the social side of the society, by Mr. D. Super, who also judged the table show and awarded the cards as follows: Labyrinth: 1, E. Stanger; 2, L. Piny; 3, E. and T. Fesser. Danios: 1, L. Piny; 2, P. Levine; 3, P. Mahahony. Rasbora: 1 and 3, P. Levine; 2, E. and T. Tester.

Further details of the society may be obtained from the Secretary, B. Slade (H. Heath 53747).

CHANGES of officers and venue of the Newcastle Tropical Fish Society are as follows: chairman, Mr. D. Wilson; secretary, Mrs. M. Grey; West House, Greenside, Ryton Tyne and Wear. Tel. Ryton 2332. Meetings:—Dun Cow, Gateshead, Alternate Wednesdays 8 p.m.

ENTRIES for the Leigh A.S. open show totalled 589 and the results were:—Guppies: 1, D. Conway (Darwen); 2, N. Stevenson (Osram); 3, E. Jones (Leigh). Platies: 1 and 2, B. and B. Durham (section winner) (Longridge); 3, T. Mackinnon (Southport). Swordtails: 1, D. Garstang (Longridge); 2, M. Allinson (Sandgrounders); 3, D. G. Potter (Warrington). Mollies: 1, T. L. Penny (St. Helens); 2, Mr. and Mrs. Underwood (Southport); 3, B. W. Carter (St. Helens). Linnias: 1 and 2, B. and B. Durham (Longridge); 3, R. O'Connell (Osram). A.O.V. Livebearers: 1, K. Thompson (Merseyside); 2, B. and B. Durham (Longridge); 3, Mr. and Mrs. Baldwin (Sandgrounders). Small Anabantids: 1, P. Skell (Leigh); 2, A. and E. Lyons (Longridge); 3, J. H. Harrison (Merseyside). Large Anabantids: 1, I. Hopkins (section winner) (Warrington); 2, G. Bond (Southport); 3, Mr. and Mrs. Baldwin (Sandgrounders). Fighters: 1 and 2, J. Haley (Darwen); 3, L. Groves (Sandgrounders). Small Barbs: 1, B. Wilson (section winner) (Skelmersdale); 2, B. Jones (Leigh); 3, N. Stevenson (Osram). Large Barbs: 1, Mr. and Mrs. Mulla (Merseyside); 2 and 3, Mr. and Mrs. Baldwin (Sandgrounders).

Small Characin: 1, B. Wilson (section winner) (Skelmersdale); 2, N. Stevenson (Ostram); 3, K. Thompson (Merseyside). Large Characin: 1, L. Groves (Sandgrounders); 2 and 3, Mr. and Mrs. Underwood (Southport). Small Cichlids: 1, N. Stevenson (Ostram); 2, T. L. Penny (St. Helens); 3, P. and H. Batchelor (Loyne). Angels: 1, P. Yates (Blackburn); 2, P. Waterworth (Leigh); 3, J. O'Conner (Runcorn). Large Cichlids: 1, P. A. Taylor (section winner) (Adriatic); 2, J. Paux (Merseyside); 3, P. and S. Taylor (Adriatic). Rift Valley Cichlids: 1, K. and A. Aldred (Hyde); 2, Mr. and Mrs. Jaden (Sandgrounders); 3, Mrs. Sudwell (Sandgrounders). Rabbits: 1, Mr. and Mrs. Muckle (section winner) (Runcorn); 2, J. Corbett (Merseyside); 3, F. Summers (Skelmersdale). Danios: 1, J. Haley (Darwen); 2, I. McCarthy (Skelmersdale); 3, T. McCarthy (Skelmersdale). Minnows: 1, Mr. and Mrs. Underwood (Southport); 2, J. Haley (Darwen); 3, S. Goddard (Macclesfield). Labeos and Sharks: 1, R. I. Payne (section winner) (Merseyside); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, S. J. Horvay (Leigh). Flying Foxes: 1, Mr. Hodge (Southport); 2, K. Arnold (Bridgewater); 3, R. O'Connell (Ostram). Loaches and Bettas: 1, Mr. and Mrs. Muckle (section winner) (Runcorn); 2, R. I. Payne (Merseyside); 3, K. Arnold (Bridgewater). Corydoras: 1, Mr. and Mrs. Muckle (section winner and best in show) (Runcorn); 2, K. Thompson (Merseyside); 3, B. W. Carter (St. Helens). A.O.V. Cats: 1, P. and S. Taylor (Adriatic); 2, I. McCarthy (Skelmersdale); 3, D. Ridyard (Leigh). A.O.V. Tropical: 1, A. Cardwell (section winner) (Darwen); 2, P. Yates (Blackburn); 3, P. and H. Batchelor (Loyne). Pairs (Egglayers): 1, K. Thompson (section winner) (Merseyside); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Baldwin (Sandgrounders). Pairs (Livebearers): 1, K. Thompson (Merseyside); 2, Mr. and Mrs. Goddard (Macclesfield); 3, L. Groves (Sandgrounders). Junior Livebearers: 1, P. Durham (Longridge); 2, D. Baker (Sandgrounders); 3, D. Garstang (Longridge). Junior Egglayers: 1, D. Haughton (section winner) (Southport); 2, D. Baker (Sandgrounders); 3, K. Corbett (Merseyside). A.V. Ladies: 1 and 2, Mrs. Underwood (section winner) (Southport); 3, E. Stevenson (Ostram). Killas (Top Spawners): 1 and 2, I. Noon (Leigh); 3, H. Jones (Leigh). Killas (Bottom Spawners): 1 and 3, J. Noon (section winner) (Leigh); 2, E. Jones (Leigh). A.V. Marines: 1, Mr. and Mrs. Iddon (section winner) (Sandgrounders). Breeders (Livebearers): 1, B. and B. Durham (Longridge); 2, I. Hopkins (Warrington); 3, Mr. and Mrs. Goddard (Macclesfield). Breeders (Egglayers 1-10): 1, D. Ridyard (Leigh); 2, B. Jones (Leigh); 3, J. Corbett (Merseyside). Breeders (Egglayers 11-20): 1, J. Noon (section winner) (Leigh); 2, J. Bradshaw (Longridge); 3, H. Pichler (Skelmersdale). Mini Jars: 1, Mr. Soradman (section winner) (Runcorn); 2, N. Stevenson (Ostram); 3, E. Jones (Wrexham). Common Goldfish: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, H. Buckley (Northwich); 3, S. O'Conner (Runcorn). Shubunkins: 1 and 2, Mr. Howarth (N.G.P.S.); 3, Mr. Downy (Sandgrounders). Moors: 1, Mr. and Mrs. Aspinall (Sandgrounders); 2, A. Unsworth (St. Helens); 3, T. and J. Durham (Longridge). A.O.V. Fancy: 1, Mr. and Mrs. Harvey (section winner) (Sandgrounders); 2, Mr. Howarth (N.G.P.S.); 3, Mr. and Mrs. Howarth (Sandgrounders). Native Coldwater: 1, Mr. and Mrs. Underwood (Southport); 2, Mr. Stedman (Runcorn); 3, T. and J. Durham (Longridge). Best Club: 1, Sandgrounders A.S.; 2, Leigh A.S.

OFFICERS elected at the annual general meeting of the Isle of Wight A.S. were as follows: president, Mrs. M. Dudley, chairman, R. Muir, vice-chairman, E. T. Davison; secretary, B. Hall; asst. secretary, Mr. Hill; treasurer, S. Stevens; show secretary, Mrs. M. Chiverton; asst. show secretary, T. Biles; committee, F. Whitehouse, D. Marshall, M. Luckman, T. Biles. Next meeting at the Unitarian Hall, Newport IOW, on the second and fourth Wednesday of each month, and fellow Aquarists can be assured of a warm welcome when on the island.

#### NEW SOCIETY

A new society is being formed in the Swindon area, to be called the **Swindon Aquatic Social Club**. Anyone interested should contact Mr. C. E. Curran, 80 Beech Avenue, Swindon, Wilts. Tel: Swindon 32920.

#### SECRETARY CHANGES

**Newcastle T.F.S.:** Mrs. M. Grey, West House, Greenside, Ryton, Tyne & Wear. Tel: Ryton 2332.

**Keighley A.S.:** Mrs. Sheila Dobson, 19 Midland Terrace, Showfield, Keighley BO21 3BP.

**Hoylake A.S.:** G. Robinson, 24 Heathmoor Road, Moreton, Wirral, Merseyside. Tel: 051-677 0370.

**Hastings & St. Leonards A.S.:** C. Pannell, 9 Edwin Road, Hastings, East Sussex TN35 5JT.

**Hoylake A.S. (New Show Secretary):** D. Laking, 82 Singsby Dr., Upton, Wirral, Merseyside. Tel: 051-677 8297.

**Saracens A.S. (New Show Secretary):** T. Woolley, 41 Tarring Road, Vale Farm Estate, East Finchley, London N2.

#### VENUE CHANGES

The **Sudbury A.S.** now meet at the Sudbury Methodist Church Hall, Harrow Road, Wembley (near Junction with Watford Road), every Wednesday at 8 p.m. New members and visitors always welcome. Secretary: Ron Walsh, 11 Wykeham Hill, Wembley Park, Middlesex. Tel: 01-904 0626.

The **Malvern & District A.S.** now meet on the first Monday in the month at St. Joseph's School Hall, Newtown Road, Malvern. Activities include talks, slide shows, discount club, table shows and monthly newsletter. New members are always welcome and the meeting usually starts at about 7.45 p.m.

Meetings of the **Newcastle T.F.S.** are now held at the "Dun Cow", Gateshead, alternate Wednesdays at 8 p.m.

#### SHOW POSTPONEMENT

Due to unforeseen circumstances the **Wynnstay A.S.** open show has been postponed.

#### SHOW VENUE CHANGE

The **Bristol A.S.** open coldwater show will now be held at St. Ambrose Parish Hall, Streetford Road, Whitthall, Bristol 5.

#### AQUARIST CALENDAR 1978

**4th June:** Sudbury A.S. Open Show at the Wasps Rugby Ground, Repton Avenue, Wembley, Middx. Schedules from J. J. Brazier, 66 Ormsby Way, Kenton, Middx. Tel: 01-204 5374.

**4th June:** Loughborough and District A.S. Open Show at Barleigh College, Thorpe Hall, Loughborough. Schedules from J. S. Parry, 10 Cleveland Road, Loughborough, Leics. LE11 2SP.

**4th-17th June:** Aylesbury A.S. are holding a large fish display at the Aylesbury Civic Centre. There are ample seating and refreshment facilities.

**10th June:** Llantwit Major A.S. "Silver Jubilee" Open Show to be held at the Town Hall, Llantwit Major. To celebrate 25 years of continuous activity we offer superior plaques for 1st, 2nd, 3rd and 4th places in 32 classes judged to P.B.A.S. standards. Schedules available, early May, from J. J. Edwards, "Glanafon," Mill Park, Llanblethian, Cowbridge, South Glamorgan, CF7 7HG.

**11th June:** St. Helens A.S. Open Show will be held at the same venue as last year's show, Rainhill Village Hall, Rainhill, Nr. Liverpool. Schedules are available from the secretary at a later date.

**11th June:** Cheltenham T.F.C. Open Show at St. Marks Community Centre, Brooklyn Road, Cheltenham. Schedules available soon.

**11th June:** Salisbury and District A.S. Open Show, at the Activity Centre, Wilton Road, Salisbury, to P.B.A.S. Rules and Recommendations. Over 40 classes, including six cichlid classes. Show schedules, available in April,

from Hon. Secretary, Mr. R. F. Adams, 26 Empick Road, Salisbury, Wilts. S.A.E. please.

**11th June:** Boston A.S. Open Show at Kitwood Girls School, Morian Road, Robin Hood's Walk, Boston. Y.A.A.S. rules. Schedules available from secretary, Mrs. M. Sands, 20 Argyle Street, Boston PE21 9PH.

**11th June:** South Shields A.S. 7th open show to be held in Bolingbroke Hall, Bolingbroke Street (near Town Hall), South Shields. Schedules available from L. A. Ruffell, 23 Nora Street, South Shields.

**17th June:** S.P.A.S.S. Open Show at Wimbledon Community Centre, St. Georges Road, Wimbledon, London SW19. Show secretary, Mr. L. Clapp, 16 Over Hillway, Beckenham, Kent.

**17th-18th June:** Aberdeen A.S. Open Show at Music Hall Union Street, Aberdeen. Full details and schedules from show secretary Mrs. G. Forbes, 10 Craigmaraun Gardens, Altens, Aberdeen. Tel: Aberdeen 872170.

**18th June:** Corby and District A.S. open show, Civic Centre, Corby. Schedules mid-March, F.B.A.S. rules. C. MacAllister, 18 Maidford Road, Corby, Northants.

**18th June:** Fancy Guppy Association, North West Lancs. (Manchester Section). Annual Open Show, commencing at 2 p.m. Benching from 12.30 p.m. All classes to be judged to F.G.A. show rules. Show to be held at The Seton Chillon Temple, Savor Street, Preston. Further details from show secretary, Mr. B. Morris, 4 Irwell Street, Burnley, Lancs.

**18th June:** Northwich and District A.S. Open Show to be held at Hartford Secondary Modern School (Boys), Greenbank Lane, off Chester Road, Hartford, Northwich. Judging to F.N.A.S. methods and standards. Further details from show secretary, Mr. D. Valentine, 43 Hartford Road, Davenham, Northwich, Cheshire. Tel: Northwich 6624.

**18th June:** Swillington A.S. Open Show to be held at the John Smeaton School, Barwick Road, Crossgates, Leeds. Schedules will be available from Show secretary, J. and S. Greenwood, 2 Garth End Cottages, Huntington, York YO31 9GU.

**18th June:** Bishop Auckland A.S. Annual Open Show to be held in King James 1st Community Centre Bishop, Auckland. Schedules from Mr. Gough, 40 Clyde Terrace, Spennymoor, Co. Durham. Tel: (0388) 815365.

**18th June:** Dunmow & District A.S. open show at the Folkes Hall, Gt. Dunmow, Essex. Fish to be benched from 7 a.m. until 11 a.m. To book entries, write or phone Mr. I. Farlow, 12 Castle Cross, Phone Saffron, Wadden 22965.

**24th June:** Nailsea and District A.S. Fifth Open Show at Holy Trinity Church Hall, Church Lane, Nailsea. Details from show secretary, Mr. P. Fitchett, 2 Woodland Road, Nailsea, Bristol, Avon.

**25th June:** Dunlop Aquarium Keepers Society Open Show to be held in Factory Canteen, Speke, Liverpool. Further information can be obtained from either, Show secretary K. Sey, 31 Bay Road, Speke, Liverpool 24 or Hon. Secretary T. Griffiths, 19 Belper Street, Liverpool 19.

**25th June:** Alfreton and District A.S. Venue, Alfreton Hall. Further information later. Show secretary, P. W. Boston, 10 George Street, Riddings, Derbyshire.

**25th June:** Killingworth Aquarist Association: Annual Open Show at Killingworth "Communicare" Centre, East Bailey, Killingworth.

**1st July:** Cardiff A.S. Annual Open Show at St. Margaret's Church Hall, Roath, Cardiff.

**2nd July:** Brighton and Southern A.S. Open Show at Portlade Town Hall, Victoria Road, Portlade, Sussex. Show secretary, M. Rooney, 66 Portlade Villas, Hove, Sussex. Tel: Brighton 411131.

**2nd July:** Blackburn Aquarist Waterlily Society Annual Open Show in the Windsor Hall, Blackburn. Schedules will be available shortly from the secretary, J. Olden, Highridge, 4 Mollington Road, Blackburn, Lancs., BB2 6EG.

**2nd July:** The Chard and District A.S. will be holding its Fourth Annual Open Show at Furnham School, Chard, Somerset. Details from Mr. A. Griffin, 24 Thornton Road,



Yeovil, Somerset. Tel. Yeovil 23231. Show schedules available.

**2nd July:** Midland Koi Association Open Show at the Whitley Abbey School, Coventry. Schedules and further information from R. Casner, 8 Swinburne Road, Hinckley, Leics.

**7th, 8th and 9th July:** Three Rivers Fish-keeping Exhibition to be held this year in the shopping complex Eldon Square, Newcastle-on-Tyne. Further details, contact Show manager, G. T. Liddle, 17 Palmerston Avenue, Walkergate, Newcastle NE9 4RD. Tel: 655794.

**8th-9th July:** Romford and Becontree A.S. Open Show (Dagenham Town Show). Central Park, Dagenham. Schedules (Agent): Mr. G. Steptow, 35 Coniston Way, Elm Park, Hornchurch, Essex. Phone: Hornchurch 44057.

**9th July:** Lytham A.S. Annual Open Show to be held at Lytham Baths, Dicconson Terrace, Lytham, Lytham St. Anne's. Benching from 11.00 a.m. to 2.15 p.m. Further details and show schedules from: Show Secretary, P. Ham, 1 Wyndene Grove, Freckleton, Preston, PR4 1DE. Tel. Freckleton 633182.

**15th July:** Goldfish Society of Great Britain general meeting, 2.30 p.m., Conway Hall, Red Lion Square, Holborn, London, W.C.2.

**16th July:** Scarborough A.D.A.S. Open Show at Gladstone Road Junior School, Wooler Street, Scarborough. Schedules (March) from J. P. Richardson, 5 Keld Garth, Pickering, N. Yorks. YO18 8DG.

**16th July:** Sandgrounders A.S. are holding their Open Show at Meola Gap School, Meola Cop Road, Southport. All enquiries to B. Baldwin, show secretary, 10 Olive Grove, Southport PR8 6BG.

**16th July:** SELAS Open Show at 141 Greenwich High Road, S.E.10. Enquiries to Mr. S. Jeffrey, 83 Alwood Crescent, Lee, S.E.12. Tel: 01-854 0262 (AMT).

**22nd July:** Basingstoke and District A.S. once again this year are holding a specialist show for all livebearing fishes in the Carnival Hall, Basingstoke. Schedules from T. Fraser, 151 Colver Road, Basingstoke, Hants.

**23rd July:** Gosport and District Aquarist Society Annual Open Show at Gosport Community Centre, Scabblington, Hants. Show Secretary: Mr. G. Arnold, 83 Quinzel Avenue, Portchester, Nr. Fareham, Hants.

**20th July:** Dorchester T.F.S. First Open Show. Schedules available from Show Secretary: G. Fox, 4 Wanchard Lane, Chasminster, Dorchester, Dorset.

**30th July:** British Koi-Keepers Society (East Anglia Section) Show will be held in the grounds of The Waveney Fish Farm, Diss, Norfolk (courtesy of D. Laughlin), and is open to all Koi-keepers. Benching closes at 12 noon. The public will be admitted as soon as benching finishes. Details from K. Groom, 24 Hunter Road, Norwich, Norfolk NR5 3PY.

**6th August:** Blackpool and Pylde A.S. Open Show at St. Kentigerna School, Newton Drive, Devonshire Square, Blackpool. Schedules from show secretary, Doreen Moseley, Flat 80, Forshaw Avenue, Grange Park, Blackpool. Tel: Blackpool 36456.

**13th August:** The Oldham & District A.S. Annual Open Show is to be held at Werneth Park, Oldham. Further information and show schedules can be obtained from P. Harris, 37 Duffield Road, Salford M7 7RA. Tel: 061-789 1757.

**13th August:** Grimby & Cleethorpes A.S. are holding their seventh open show at the Cleethorpes Memorial Hall. Benching from 12 noon to 2 p.m. Details and schedules available from the show secretary, Mrs. B. Mathews, 16 Swales Road, Humberston.

**20th August:** Stroud and District A.S. next open show at the Subscription Rooms, Stroud. Show manager, J. Cole, The Hill, Randwick, Stroud, Glos. Tel: Stroud 4504.

**20th August:** Stretford and District A.S. Annual Open Show is being held at Baile Hill

High School, Eccles Old Road, Salford. Details can be obtained from Mr. L. Evans, 67 Edgerton Road South, Chorlton, Manchester.

**27th August:** Long Eaton A.S. Open Show to be held at Gregory's Rose Gardens, Toton, Nottingham. Schedules available later.

**27th-28th August:** Great Yarmouth and District A.S. Exhibition 78. Tropical and Coldwater fish plus Society Tableaux. Hopton Village Hall (on A12 between Great Yarmouth and Lowestoft).

**28th August:** Petersfield and District A.S. First Open Show at the Town Hall, Heath Road, Petersfield, Hants. Show Secretary, Mr. G. Stacey, 6 Highfield Road, Petersfield, Hants.

**28th August (Bank Holiday):** The Yorkshire Koi Society Second Open Show will be held at Harewood House, Nr. Leeds. Champion Fish plus the attraction of the House and Gardens. Trade stands will also be present.

**28th August:** Southport A.S. will be holding their second open show at the Oakleaf Hall, Formby British Legion Club, Whitehouse Lane, Formby.

**2nd September:** C.N.A.A. Welsh National Open Show at the Drill Hall, Paris Street (near Bus and Rail, General Station), Cardiff. Details from C. Turner, 146 Arran Street, Roath, Cardiff. Tel: 499982.

**3rd September:** Bridgewater A.S. Open Show at St. Georges Community Centre, Kenyon Way, Little Hulton, Wensley, Manchester. Details from Show Secretary, M. Burgoyne, 15 Pansy Road, Farnworth, Bolton, Lancs. Tel. Farnworth 792263.

**3rd September:** Castleford A.S. Open Show. Castleford Civic Centre. Secretary: Miss B. Stanall, 4 Milnes Grove, Airedale, Castleford WF10 2EJ. Tel: 559615.

**3rd September:** Bridgewater and District Aquarist Society. First Annual Show to be held at the Newmarket Hotel, Bridgewater, Somerset.

**3rd September:** Open Show in aid of 'Action Research for the Crippled Child' at Shetland Road Hall, Southmead, Bristol. Schedules: D. Chinn, 28A Cavendish Road, Henleaze, Bristol 9. S.A.E. please.

**3rd September:** Wellingborough & District A.S. open show. Details from D. Thirkettle, 96 Grange Way, Rushden, Northants.

**9th September:** Hounslow and District A.S. Open Show at Hounslow Youth Centre, Cecil Road, Hounslow, Middx. Schedules obtainable from show secretary, Mr. A. Constantine, 77 Sparrow Farm Drive, Feltham, Middx. Tel: 01-751 0340.

**9th September:** Kingston and District A.S. Open Show. The venue will be The Raynes Park Methodist Church Hall, Worples Road, Raynes Park, SW20. Judging will commence at mid-day.

**9th September:** Bristol A.S. Open Coldwater Show. St. Ambrose Parish Hall, Srexford Road, Whitehall, Bristol 5. Schedules from W. G. Ham, 18 Imperial Road, Bristol BS14 9ED. Tel: 0272 776924.

**10th September:** Longridge and District A.S. second open show at Longridge Civic Hall, Willows Park Lane, Longridge, Preston, Lancs. (15 minutes from the M6). Details available later.

**10th September:** Huddersfield T.F.S. Open Show. Venue: Deighton Youth Centre. Show secretary, D. Hill, 30 Celandine Avenue, Salendine Nook, Huddersfield. Tel: Huddersfield 650437.

**10th September:** First Open Show of the Ivesham Fishkeepers Society. Venue, Public Hall, Ivesham, Worcs. Schedules available at a later date.

**17th September:** Whitby & D.A.S. Third Annual Open Show will be held at the 'Spa Pavilion', Whitby. Schedules will be available at a later date from the Show Secretary.

**17th September:** Priory A.S. Annual Open Show at St. Anselm's Church Hall, Billy Mill,

North Shields. Details from Mr. E. Brown, 18 Prestbury Road, Chilton, North Shields, Tyne and Wear.

**17th September:** Wythenshawe and District A.S. Open Show at the Forum Hall, Civic Centre, Wythenshawe, Manchester.

**17th September:** Barnsley A.S. Open Show, Ardsley Oaks, Youth Centre, Doncaster Road, Ardsley. Please note change of venue. Benching from 12 (noon) to 2 p.m. Schedules obtainable from: Secretary, M. Whiteley, 80 Clough Road, Hoyland, Barnsley. Tel: Barnsley 742646.

**17th September:** Hastings & St. Leonards Open Show at The Zodiac Centre, Priory Road, Hastings, East Sussex. Show Manager: Mr. C. Pannell, 9 Edwin Road, Hastings, East Sussex TN35 5JT.

**22-23-24th September:** Grimby & Cleethorpes A.S. are displaying a Tableaux Stand in The Hobbies For All Exhibition at the Memorial Hall, Cleethorpes.

**24th September:** Midlands Aquatic Study Group Open Show at the Cannock Community Centre, Avon Road, Cannock, Staffs. 37 classes. Judging to FBAS standards. Schedules available May from J. Fuller, 38 Cambrian Lane, Rugeley, Staffs WS15 2XH. Please enclose s.a.e.

**1st October:** Eboracum A.S. Open Show at Nunthorpe School, Scarcroft Road, York. Judging starts approx. 2.15 p.m. Show secretary: M. L. Nobler, 6 Bellhouse Way, Ainsty Park Estate, York.

**1st October:** David Brown A.S. Second Open Show. Held in the Works Canteen, David Brown Tractors, Meltham, Nr. Huddersfield. Schedules available July onwards. For details send s.a.e. to the show secretary, Mr. J. Sykes, 27 Penistone Road, New Mill, Nr. Huddersfield. Or telephone (0484) 43395.

**1st October:** Midland Aquarist League Open Show, Loughborough. Schedules: Mr. E. Underwood, 10 Hyde Road, Kenilworth, CV8 2PD. Tel. 59280.

**1st October:** North Wilts. A.S. Second Open Show. Details to follow.

**7th October:** East London A. and P.K. Annual Open Breeders Show at Ripple Road School, Suffolk Road, Barking, Essex. Show schedules available later from show secretary, Mr. T. Waller, 1 Sparsholt Road, Barking, Essex.

**12th October:** Darwen A.S. Open Show at the Darwen Tower Room (Town Centre). Details from Mr. M. Jones, 16 Eaton Street, Darwen, Lancs BB3 3JS.

**20th October:** Midland Aquarist League Open Show and Last Inter-Society Show of the Year, Rugby. Schedules: Mr. F. Underwood, 10 Hyde Road, Kenilworth, CV8 2PD. Tel. 59280.

**20th October:** Doncaster and D.A.S. Open Show. Venue: Don Valley High School, Jossey Lane, Scawthorpe, Nr. Doncaster. Details from Show Secretary, Mr. B. Honnor, 67 Carr View Avenue, Balby, Doncaster.

**5th November:** Halifax A.S. Open Show at The Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Thirteen livebearer classes, plus eleven coldwater. Furnished aquaria, plants, etc. Schedules sent only on request. S.A.E. to: D. Shields, "Cobblestones", Gainest, King Cross, Halifax, HX2 7DT, or ring for details Halifax 60116.

**12th November:** Bradford & District A.S. Open Show is to be held at Teaxle Hall, Westgate, Bradford 1. Schedules and other information can be obtained from Mr. J. Cornforth (Show Secretary), 15 Weymouth Avenue, Allerton, Bradford, West Yorkshire.

**18th November:** Goldfish Society of Great Britain general meeting, 2.30 p.m., Conway Hall, Red Lion Square, London, W.C.2.

**19th November:** Northallerton and District A.S. Open Show. Schedules available later. Show Secretary, B. P. Summerscales, 97 Long Street, Thirsk.

## PLACE STICKERS FOR OPEN SHOWS

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