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THE **AQUARIST**  
AND PONDKEEPER





# THE AQUARIST AND PONDKEEPER

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A Pair of *Apistogramma*  
*ramirezi*.

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# Coldwater Fishkeeping

## REARING GOLDFISH FRY

by Arthur Boarder

THE QUESTION as to whether to use artificial warmth for rearing the fry often crops up. As far as common goldfish are concerned I am sure that it is not worth the trouble and expense to do so. However, when breeding any variety of fancy goldfish I am certain that it pays well to use some form of extra heating at least while the fry are under six months of age. Where a fish-house is in use the provision of extra warmth can be easy but if one is not in possession of this advantage, it is quite possible to raise the temperature of rearing tanks by standing them in a garden frame. It is surprising how much warmth can be attracted from the sun by a sheet of glass over a tank.

The best way to warm the water is to use a tank heater of 100 watts and use a thermostat to control the temperature to around 70°F. This I find is a very good level to attain, although I do not suggest that this must be maintained at the same level day and night. On warm, sunny days the temperature of the water may rise several degrees, but this will not harm the fish at all, in fact they enjoy the change of temperature and it tends to harden them. If the tanks are to be artificially warmed it is imperative to use aeration. The warmer the water the less oxygen can it hold and when rearing fry it is most important to make sure that the oxygen content of the water never falls to a dangerous level. If it does the fish can go off their food and conditions in the tank can deteriorate quickly.

It must also be remembered that when a fair number of young fish are feeding well in warm water, their droppings and other wastage are copious. The water can soon become polluted and although a weekly partial change of water is beneficial, it may well be that a change will have to be made more frequently, say twice a week. The actions of the fish after such a change is very obvious as they become more active and feed more frequently. Many fry are lost by some aquarists because they fail to change a good quantity of water in the tanks often enough.

The question of feeding the fry in warm water is now a major factor. In such water, providing it is in good condition the fish will be eating most of the time and they can be fed small quantities every two hours during daylight. I know that this may seem too frequent, but it is surprising how much a healthy young fish can eat in good conditions with warmth. Up to the age of a month the fry can be fed dust-like particles, but after this the size of the food can be slightly increased. Always remembering that if too large pieces are given then one or two of the fry may take this and then grow at a faster rate than others which is not always an advantage.

The advantages of using warmth will soon become obvious to anyone using it for the first time. The rate of growth is more than doubled and the varieties with hard scales will change colour to the desired red much more quickly than if the fry had been reared without artificial warmth. For many years I used no heat at all and it was only when I had a very late spawning from some good parents that I decided that it was too late in the year to try to rear the fry without some form of heating. Once I tried this method and I was astounded at the rate of growth and found that at two months of age those which had been reared with warmth were more than double the size of the ones reared in cold conditions.

The rate of colour change is quite remarkable in those fry reared with warmth. I have had some which were not much more than an inch in length over-all start to change colour. I now find that most of the fry change colour completely within six months whereas before using warmth, some of the fry did not change colour until the following year.

When the fry are small it is sometimes a problem to change part of the water without removing some of the fry. My method is to lower a fine nylon net into the water and dip out from within it with a cup or small saucepan. When the fresh water

is being run in ordinary tap water at the normal temperature can be used. I have never found any of the fry in the least bit disturbed by the colder water being run in. I use a fine rose fitting to the water-can so that the water in the tank is not disturbed too much. Although a partial change is essential this does not mean that the tank can go for several weeks without being cleaned out thoroughly. The amount of mulm on the bottom of a tank with a fair number of fry which have been feeding well can be considerable and if left undisturbed for long can cause the water to become foul when fry can be lost. It is always easy to tell if all is going well with the tank, as the actions of the fish will soon show whether they are progressing well. I always use a feeding ring in these tanks, as it keeps the fine food from spreading all over the surface of the tank. Some can then fall among water plants and remain uneaten when trouble can ensue.

Having reared the youngsters to six months of

age it will now be possible to lower the temperature of the water. If they have made good growth and it is not too late in the year the temperature can be gradually lowered to the low sixties. If a fish-house is available then this range can be kept all through the first winter. The fish will still feed well but not of course as much as when the water was warmer and the days longer. However, if the suggested temperature can be maintained all through the winter the growth of the fish will soon indicate the value of the added warmth.

There is an important point to consider when the above methods are being used and that is, never use any base compost at all in the tanks. By only using Hornwort (*Ceratophyllum demersum*), as a water plant there is no need for compost, as this plant never makes any roots and so thrives well in a tank without any form of soil. It also makes it so much easier for cleaning out and prevents any pests from lurking in the bottom.

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## *Cichlasoma spilurum*

by K. N. Walsh

*Cichlasoma spilurum* is found in Costa Rica along with other *Cichlasoma* species.

It is very peaceful compared with other large cichlids of the *Cichlasoma* species and can be placed in a community tank with other fishes of a similar size. In my own experiences, it does not tear out plants, neither does it dig extensively in the gravel.

The males of this species grow to a length of six inches in the aquarium. The colour of the body is a dusky blue-grey on the back, fading to a silver-grey on the belly. There are nine darker vertical bands on the sides, the first one runs from the top of the head to the eye, and the last is at the caudal base. The head of the male is rather blunt, with mature specimens showing a slight bulge on the upper part. The colour of the head is the same as that on the back. There is a slightly darker bar that runs from the corner of the mouth to the eye. The eye is a greenish-blue. The dorsal, anal and ventral fins are a pale grey at the base getting darker towards the edges, which have a black border. The caudal peduncle is almost clear and so are the pectorals.

The females of this species are slightly smaller than the males. The basic body coloration is the same as that of the male. The head is not so blunt in shape

as is the male's, and does not show the slight bulge on the upper part. On the dorsal fin is a large black spot, which is lacking in the male. The ventral fins are a smoke grey, turning jet black when in breeding condition.

This species looks a lot like *Cichlasoma nigrofasciatum*, but the vertical bands on the sides of *C. spilurum* are not so dark and pronounced.

*C. spilurum* is a fairly easy species to breed provided specimens are well conditioned with plenty of live food. They spawn in the usual manner for a *Cichlasoma* species.

The pair of fish that I had were kept in a cichlid community tank along with *Cichlasoma severum*, Golden angels and *Aequidens maroni*. They had spawned twice previously on a flat stone in the corner of this tank, but none of the spawnings was observed. The eggs of both spawnings were eaten; one by the other occupants of the tank and one by the parents.

After these two losses, it was decided to set up a separate tank and try to see if they would raise their own eggs without eating them.

A 25 gallon tank was chosen to breed them in so they would have plenty of room. Gravel was put in the bottom to a depth of two inches. The aquarium

was furnished with a few large flat stones and a large plant-pot laid on its side in the corner of the tank which was the darkest. No plants were added to this tank.

The water conditions for breeding this species are not too critical, but the water should be clean and well filtered. The pH of the water was 7.2 (tap water), with a hardness of 10 DH. The temperature was maintained at 80°F.

The two fish were placed into the tank three days after it was set up. They immediately headed for the corner of the tank behind the plant-pot where they remained for several hours. Once the fish had settled in their new quarters, they started to look for a suitable hide-out. Unfortunately, the plant-pot was the only thing available to them. In and around this they eventually settled, the male staying inside the plant-pot and the female behind it, almost out of sight. In this area of the tank both fish remained, only coming away from it for food. They seem rather shy for a *Cichlasoma* species, but this may be due to the lack of other suitable places to hide.

For two weeks the pair were fed on large amounts of live foods, such as; *tubifex* worms, *daphnia*, blood worms and chopped garden worms. Supplementary foods like freeze-dried mosquito larvae, freeze-dried brine shrimp, peas, liver and beef were also added to their diet.

After the pair had been in the tank for seventeen days, the female began to colour up. The body took on a dusky grey sheen, the vertical bands on the side almost disappearing leaving four dark blotches in the centre. The large spot on the dorsal fin became more intense and the ventral fins turned jet black. The male coloured up soon after the female, but not to the extent that she did. The breeding tubes of both fish were quite visible, the male's being smaller and more pointed than the female's which was large and rounded at the end.

*C. spilargenteum* are sometimes quite secretive about their spawnings, but the sight of the ovipositor and the change of colour is almost a sure indication that something will happen during the next few days.

During the next few days, both fish were busy cleaning the spawning site; it was at the back of the plant-pot. The female seemed to be in charge of this operation as she occasionally chased the male away.

After the fish had been in the tank for twenty days, the actual spawning took place. At 9 o'clock in the morning, the female made a few dummy runs up the back of the plant-pot followed by the male doing the same. These actions were followed by the actual egg-laying. The eggs were laid a few at a time, first in straight lines, then the lines began to form a crude circle. Every time a few eggs were laid, the female moved out of the way to let the male in to

fertilise them. These actions went on for about 45 minutes until the female was depleted of eggs. After the spawning the female stayed near the spawning site fanning the eggs with her fins while the male stayed close by, presumably to defend the area against intruders.

On the 21st day both the male and the female took it in turns to fan the eggs, but the male spent most of the time digging a large depression in the gravel at the back of the tank quite close to the spawning site. This was for the young fry to be placed in after they had hatched from the eggs.

When checking on the eggs the following day, a large number of them were missing. Whether the parents were eating them because they had fungused or through disturbance caused by myself when entering the room, it was never observed. To prevent the remainder of the eggs from being eaten the plant-pot was removed and placed in a shallow tank filled with water from the breeding aquarium. A 2½ per cent solution of Methylene Blue was added until the water was deep blue. An airstone was placed near the plant-pot with a gentle stream of air bubbles passing near to, but not touching the eggs. This kept any particles in the water from settling on them which would probably cause them to fungus.

On the third day after spawning the first of the fry started to emerge from the eggs. This carried on at irregular intervals throughout the day until all of the fry had hatched. As they hatched the young embryos fell to the bottom of the tank where they wriggled for a further three days before the yolk sac had been absorbed, and at the end of this time they were free-swimming.

The plant-pot was removed at this stage. All the particles of waste from the eggs was removed from the bottom with an eye-dropper to prevent them fungusing and fouling the water. For the first week the fry were fed newly-hatched brine shrimp four or five times a day to get them off to a good start. The second week microworms and fine dried food especially prepared for young fry was added to this diet. By the third week they were able to eat chopped *tubifex*, sifted *daphnia* and chopped white worms. A good varied diet is essential for rearing the fry and keeping them in good health. The young should be moved to a larger tank after about four weeks to prevent overcrowding. They soon reach the half inch mark if well fed.

This fish is one of my favourites among the *Cichlasoma* species as it is very undemanding in its requirements and is also ideal for the beginner (who has the room) to breed with ease. A good sized pair will lay as many as 400 eggs in a single spawning. Being fairly shy fish, they are inclined to eat the first few spawnings, but if left undisturbed I would imagine they would make reasonable parents and rear the fry themselves.



## 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

by Jack Hems

**I should like to know the scientific name and country of origin of the ember barb. Also, can this fish be bred in the ordinarily set up home aquarium?**

The formal name of the ember barb is *Barbus melanampyx*. It is native to India. This fish is rather difficult to come by but it is not backward in breeding (so I have been informed) if it is given plenty of warmth, a bright light and thickets of plants to chase about in and use as a repository for its eggs.

### **How can I make acid water alkaline?**

If you introduce crushed egg-shells, a small amount of bicarbonate of soda, limestone chippings, plaster of Paris or even a piece of white blackboard chalk you will alkalinise the water. However, it is not a good plan to make any abrupt change in the pH of water in which fishes are present. Make the change from acid to alkaline very gradually. Thus after every addition of chalk or whatever take a pH test.

### **What is a Chinese algae eater?**

The so-called Chinese algae eater is the ubiquitous sucker-mouthed fish known to science as *Gyrinocheilus aymonieri*. In its larger sizes this fish frequently makes a nuisance of itself by sucking at the sides of other fishes inhabiting its tank. The popular name of Chinese algae eater does not make sense. The species is native to India. Neither is it a true loach (it is sometimes called a sucking loach) of the family *Cobitidae*.

### **Is a 15-watt fluorescent lamp sufficiently bright for a planted 24 in. by 12 in. tank?**

Not really if you wish to grow some of the popular aquarium plants successfully. I recommend that you equip your tank with a 20-watt fluorescent lamp and keep it switched on for about 14 hours a day.

**My male swordtail is a long time developing its sword. What is the reason for the delay?**

Some male swordtails do take a long time to develop the prolongation of the bottom rays of the caudal fin. But this is a good sign. The slow-starters usually end up with a better 'sword' than the rapid developers. All the same, some male swordtails never develop the fine long sword of the wild-type Mexican green swordtail.

### **Please supply me with some information about a fish called *Tylobranchius maculosus*.**

*Tylobranchius maculosus* is closely related to the headstanders of tropical South America. It attains a length of about 6 in. and bears a resemblance in general outline to *Chilodus punctatus*. The coloration is light clay to brownish yellow overlaid with a silver sheen. A broken or complete horizontal stripe of dark brown to black adorns the sides. The fish flourishes best in soft and acid water and eats a wide variety of live flesh and dried foods. It is not easy to find this fish described in the general run of aquarium books but Professor G. Sterba has quite a lot to say about it in his *Freshwater Fishes of the World*.

### **I have just bought an old iron aquarium frame that needs reglazing. What is the best treatment I can give this frame to remove the rust and prevent rapid deterioration of the metal frame?**

I am afraid I cannot tell you the best way of defeating rust but what I would do would be to give the frame a good scouring with a stiff wire brush. After dusting off the frame, I would then give it two coats of aluminium paint followed by two coats of a first-class brand of polyurethane paint. After glazing in the usual way, I would seal all inside joints with a silicone rubber sealant. The sealant could be spread along the underside of the top angle irons. This would waterproof them and prevent corrosion.

**Is it all right to feed blow-fly maggots to oscars?**

Provided the oscars are large enough to masticate the maggots all will be well. For all that, too many maggots are not an ideal food. Feed plenty of earthworms, raw red meat, unwanted livebearers, strips of uncooked cod, herring, fresh haddock, cooked beef heart rather than maggots.

**I have a tank stocked with one 13 in. black shark, four 7 in. tin foil barbs, two 8 in. gold foil barbs, two 12 in. fire eels, two 14 in. shovel nosed catfish, one 15 in. pacu, and one 17 in. arowana. The tank is 6 ft. long by 2 ft. tall by 2 ft. across. Do you think I have too many fish in this tank?**

I most certainly do. The tin foil and gold foil barbs will grow larger than they are at present, the fire eels may exceed 18 in. and the arowana may reach a few inches more. Even the pacu can increase in size. Apart from all this some of your fish are almost certain to fall out with one another and then you will have real trouble.

**I have a 42 in. by 15 in. by 12 in. tank stocked with a red-fin shark, two glass fish, one kuhli loach and two guppies. In the near future, I will be adding some Siamese Fighting Fish and various cichlids. Do you think all these different species will agree?**

I do not. In fact you are heading for disaster. I strongly advise you to seek the advice of a knowledgeable dealer or join a local aquarists' society or both or soak yourself in the writings of such authors as Wm. T. Innes, G. Cox, Cust & Bird, and other authors a knowledgeable dealer will recommend.

**If I boil sea shells will they be all right to decorate the floor of my tropical aquarium housing a selection of tetras, barbs and livebearers?**

Sea shells dissolve out lime so please do not introduce them into your tank. If you feel you must have something besides grit on the floor of your tank go in for well-scrubbed pieces of granite or lumps of coloured slate.

**Would a tank measuring 72 in. by 18 in. by 18 in. be large enough to keep a few discus and what conditions would you advise?**

If the tank is the ordinary metal framed and putty-like glazed affair, then I suggest that you seal all inside joints with a silicone rubber sealant. For water for discus must be free of metal salts or anything in the glazing compound likely to alkalinify the water. The water itself must be soft and preferably peaty acid. All stones and compost must of necessity be calcium free. First class filtration is necessary. Another

essential is a high temperature. I suggest that you get in touch with the specialist dealers in discus who advertise in our magazine. If you do this you can hardly go wrong.

**Is it possible to obtain quantities of a live food called gammarus over here? I have seen gammarus advertised in an American magazine but have not come across it in dealers' shops in my locality?**

*Gammarus* is the generic name of a number of crustaceans popularly known as freshwater shrimps. They are not in short supply in the wild state in this country. If you go out with a fine-meshed net and turn up waterlogged lumps of wood or large stones on stream beds, lakes, filled ditches, and the like, you will see crowds of these small shrimp-like creatures swimming to fresh cover. They are of a greyish colour. Freshwater shrimps make a good live food for those fishes large enough to swallow them. Take care though that you do not include dangerous pests with your catch. I suggest that you borrow a book on pond creatures from your local library. You will learn a lot about the freshwater shrimps and their appearance from such a book. One of the best is *The Freshwater Life of the British Isles* by John Clegg.

**What is the best food for White Cloud Mountain minnow fry?**

Strictly speaking, I do not think there is a best food for *Tanichthys* fry. What is needed is a mixture of live and dried food of a size the fry can swallow. In short, freshly cultivated infusorians fed into the aquarium via a siphon tube from a jar, or a proprietary dust-fine dried food or crushed flake food sieved through fine nylon mesh. As soon as the fry start to fill out get them onto micro worms, then Grindal worms and so on.

**What is the best way to keep *Mystus vittatus* and is this fish suitable for a community aquarium?**

This species of the family *Bagridae* is easy to feed on any of the regular live, flesh and dried foods accepted by non-faddy aquarium fish. It flourishes at a range of temperature of from about the lower seventies to the low eighties (°F). It hides behind plants and stonework most of the day but is active at night and after dark. As it reaches a length of 8 in. or thereabouts it is not recommended for a small aquarium. Again, a word of warning. In its larger sizes it is often guilty of molesting other fishes sharing its tank and is not averse to eating species small enough to swallow.

**I am interested in obtaining a pair of piranhas. Could you give me any information with regard to a source of supply. Furthermore, I would be**

grateful for any tips about feeding and the dangers to look for in keeping piranhas.

Most specialist dealers in tropical fishes have piranha fishes for sale every so often. Therefore it is best to keep shopping around until you find a species of piranha for sale. There are several true flesh-greedy piranha and some piranha-like species that accept a more catholic diet. The red-bellied piranha (*Serrasalmus nattereri*) is a true piranha and is best kept by itself and not even with its own kind. Keep its tank covered and do not introduce your hand into its

aquarium. Some piranha fish are faddy about their food and must be tempted with such things as freshly killed goldfish, pieces of raw red meat, large earth-worms, slivers of uncooked cod or fresh haddock and so on and so on. A temperature of about 75°F (24°C) is about right. The aquarium may be planted with plants such as *Cryptocoryne affinis*, *Vallisneria spiralis* and similar tallish to tall-growing species. The red-bellied piranha attains about 8 in. in the aquarium, which is less than it reaches in the natural state. Yet even at 8 in. it could shave off the tips of a few fingers.

## COLDWATER QUERIES

by Arthur Boarder

We have a pond in the garden of a fair size. It is well planted and stocked with fishes. It also has a lot of sticklebacks, snails, frogs and newts. Recently we have noticed some of the fish with sores, fin-rot and Fungus disease. There are many small creatures in the pond. Are any of these likely to harm the fish?

Some of the inhabitants of your pond could be the cause of the troubles. Sticklebacks are often suspected of bringing in pests and diseases. They are usually taken from a pond or a stream and can carry several types of pest. They are well known as hosts of the fresh water mussel larvae or young. It is mistake to introduce into a garden pond anything from the wild such as fishes or plants. The frogs are not likely to do any harm to fishes at this time of the year, (Summer), as most of them leave the water once they have spawned, although a few sometimes remain in or near the water for some time. The newts will also leave when breeding is finished, except any young ones which have been bred in the pond. Apart from these there are almost certain to be many creatures such as the larvae of dragon flies and water beetles. Many of these may be caught with a net as they have to come to the surface to breathe occasionally. Night time is the best time to catch them as if one approaches the pond quietly with a strong torch, it is probable that many pests will be seen at the surface when they can be caught easily. I suggest that you try to get rid of the Sticklebacks and the water snails, as they serve no useful purpose.

**How can I get rid of smooth water newts from my pond?**

Make a trap as follows: Get a preserving jar, 2 lb. type if possible and discard the glass top. Then get a plastic funnel and trim it so that it fits into the top of the jar so that it can be secured by the screw cap. If



Male Smooth Newt

the hole of the funnel is too small for a newt to enter, cut a little off. The tube end must be in the jar. Tie a piece of plastic string round the neck of the jar and lower it into the pond with a garden worm inside. If there are any newts in the pond you will find one or more inside the jar in the mornings. I have never found this plan to fail. You can remove the newts to a pond some distance away. I do not think that newts do any harm to adult fishes but they are ravenous feeders under water and could eat small fishes and other foods given for the fishes.

**Could you let me know if laburnum leaves and seeds are harmful if they fall into a fish pond?**

The leaves and seeds of the laburnum tree *Leguminosae spec.* are poisonous as are also all parts of the tree. Whether they could kill the fishes in your pond depends on the amount of water and that of the leaves and seeds. The seeds are very hard and are likely to take some time to soften and give off any poison. In a fair sized pond a few leaves or seeds are not likely to do much harm. I had a flowering laburnum in my garden quite near my breeding pond



and never found any harmful effects from fallen leaves etc. I always netted off any leaves which fell on the water every day if possible.

**I have been losing some of my fancy goldfish which are kept in a tank of a fair size. They suddenly become ill and die without showing any injury or disease. I feed them on earth worms, freeze dried *Tubifex*, ants' larvae and other live foods. Can you explain why the fish die?**

It is of course difficult to say definitely what caused the death of your fish. When a fish dies and shows no outward signs of injury or disease, one must come to the conclusion that the food may have been the cause. I do not like the ants' larvae as a food for the fish. I am not sure about this, but ants have a sac of formic acid with which they can upset any enemies, and so it may be that the larvae or pupae may also contain some of this poison. I would cut out these larvae from the diet and I personally would give no live food at all except garden worms, white worms or cleaned maggots.

**I have a lake about 80 x 50 feet which I have filled with water pumped from a small stream lower down. What kinds of fishes do you recommend? I thought carp would help to keep down filamentous Algae but what about mosquito larvae?**

Carp will do well in your pond if you get a fair amount of under-water oxygenating plants. To combat the chances of mosquito larvae, get a few Golden Orfe. These fish will be ideal for your pond.



Golden Orfe

They are handsome fish which grow rather rapidly in the right surroundings, they shoal well and are surface feeders. This means that they may be often seen at or near the surface of the water, which is one of the drawbacks of many other types of pond fish which may

rarely be seen in a fair sized pond. I consider that the Golden Orfe is, without doubt, the finest specimen for the pond as long as there is sufficient swimming space and plenty of oxygen in the water. I rank them better than Koi for the average fair sized pond as they are not quite as susceptible to unfiltered water as are the Koi. They also usually swim nearer the surface of the water and so, if not as colourful, are certainly very attractive fish for those ponds not fitted with filtration. I have enclosed an address from which you can obtain the Orfe you need.

**I have some Bitterling in a tank. Is it essential to have mussels in the tank for them to survive?**

The Bitterlings do not need mussels in the tank unless they are to breed. It would not be easy to breed these fish unless the tank was of a fair size and had plenty of mud or mulm on the bottom. This is necessary for the survival of the mussels. They can only move around in such matter and so if introduced into a tank with a gravel base only, they could soon die and pollute the water.



Pair of Bitterling and Mussel

The word mulm may not be familiar to people who are not fishkeepers. It is a term used to describe the silt at the bottom of a fish tank mostly formed from the droppings from the fishes. I can recall some years ago, that an editor of a publication for which I had written an article, challenged my use of the word 'mulm', as he said that no one in the office had heard of it nor could it be found in a dictionary. After searching in several dictionaries I did eventually find it with the meaning as I have described.

**I want to have a fish pond in my garden. How do you make one? Where can one buy the fish? What is the best food and where can I get it? Where can I get the best plants and are there any of them which could be grown for human consumption?**

The best advice I can give you as a beginner is to get

*Continued on page 221*

# CRYPTOCORYNES (5)

*Cryptocoryne balansae*

*C. johorensis*

*C. longicauda*

*C. versteegii*

by Vivian De Thabrew, M.A., N.D.T., F.L.S.,

THIS final article on Cryptocorynes is devoted to the above four species, which, apart from being fairly rare, have very striking characteristics. Occasionally one or two of these species may be available to the trader.

## *Cryptocoryne balansae* Gagnepain

*Habitat:* Thailand and Sompong region, growing in clear-water rivers with plenty of rock and mud.

*Description:* A handsome plant, strong and tall with long, narrow, lanceolate leaves which are corrugated and crinkled. The leaf-blade grows up to twenty inches (fifty centimetres) in length, but this size will not be reached in even the deepest home aquarium. In appearance it resembles the leaf of an *Aponogeton undulatus*, but is very long and narrow.

The bronze-green leaves are borne on olive-green petioles about two inches (five centimetres) long. From the prominent midrib radiate four to five fine veins on either side. The underside of the leaf is a dull or even yellowish green. The corrugated leaf surface frequently appears to have yellowish blotches, thus giving it its pretty appearance.

*Cultivation and propagation:* The first essential requirement is a deep tank. As *C. balansae* is a very tall plant, the tank should be at least eighteen inches (forty-five centimetres) deep. The next requirement is a good muddy bottom with gravel or small rocks. The depth of the gravel-mud base should be at least three inches (seven and a half centimetres) in order to support the plant's long, wiry roots. A mixture of clay and peat to the proportion of three to one covered over by fine aquarium gravel to the depth of two inches (five centimetres) should provide the ideal base.

*C. balansae* also requires very good light, though it need not necessarily be strong. If, however, strong illumination is given, then the leaves turn purplish or carmine. The stalks, too, will assume this colour.

Usually *C. balansae* prefers slightly acidic water, but in the aquarium it will do well even in slightly alkaline conditions. However, it is advisable to keep the water slightly acid in order to encourage healthy leaf growth with strong cell-chains. Once established it rapidly produces lateral shoots. These are the ones to be used for propagation. Remove them by cutting them clean with rootstock and plant them individually in a prepared flower-pot with the clay-peat mixture, and emerse the pot to a depth of about nine to ten inches (twenty-two and a half to thirty centimetres). As the plantlets grow increase the water-level.

## *Cryptocoryne johorensis* Engler

*Habitat:* Malayan peninsular, Sumatra, Indonesia. It grows in swampy regions, and often in muddy areas by river banks.

*Description:* The leaves are about two to four inches (five to ten centimetres) long and ovate, with a wide base shaping out to become heart-shaped. These are one and a half to three inches (three and three quarters to seven and a half centimetres) broad, and are borne on a stiff petiole of up to three inches (seven and a half centimetres) in length. The leaf-blade margin is slightly corrugated. The prominent mid-rib radiates five pairs of secondary veins, and the entire nervation on the leaf is very distinct. The tip of the leaf is pointed, though not sharply. Both sides of the leaf are pale green, though on younger leaves irregular darker green blotches may appear. These fade out as the leaves attain maturity.

The flowering spathe is oval-shaped, light purple and about one and a half to two inches (three and three quarters to five centimetres) long.

*Cultivation and propagation:* As with most Cryptocorynes, the planting medium should ideally be a mixture of clay and humus material. A mixture of

unwashed river sand and peat would also be quite adequate. The bottom depth should be at least three inches (seven and a half centimetres) in order to develop a stocky root-stock. It prefers slightly acidic water and does well in a pH range of 6.6 to 6.8. Once established it will grow well even in neutral water conditions. It is quite indifferent to light conditions, and will adapt according to the light intensity available. The pale green leaves remain so in poor light conditions, but an increase in intensity will change the colour to bronze-brown or reddish brown.

Propagation is by means of long, fleshy runners. These are numerous, and, if left alone, will eventually grow to create a spreading cluster of plants. Once the plantlets are about a couple of inches (five centimetres) tall they can be removed by cutting the undergravel runners and transplanted.

*Cryptocoryne longicauda* Becc. Ex Engler

*Habitat:* Borneo. Thrives in swampy conditions and in murky conditions.

*Description:* The leaves are ovate, up to five inches (twelve and a half centimetres) long and three inches (seven and a half centimetres) wide. The base is narrow and heart-shaped. The tip is more or less blunt. The deep green leaves, borne on stalks of up to five inches (twelve and a half centimetres), have a wide midrib with five or six lateral veins on either side. The edge is slightly wavy on mature leaves.

*Cultivation and propagation:* This plant is very undemanding as to its requirements. The average aquarium gravel base will be tolerated, though the usual mixture of clay and peat or unwashed sand will provide the ideal conditions. It does not require strong light, and distinctly thrives in shady conditions. In this situation the leaves become shiny, velvety green and the stalks thick and brown. It spreads rapidly, and when compact the plantlets should be transplanted.

This species is very similar to *C. johorensis* in most

characteristics, the leaf features being the most distinguishing ones.

*Cryptocoryne versteegii* Engler

*Habitat:* Western New Guinea. Known to be growing in shallow clear waters, often growing emersed.

*Description:* This species is characterized by its almost uniquely shaped leaves which are triangular or heart-shaped, with a pointed tip. They are a deep or bluish green and one to one and a half inches (two and a half to three and three quarters centimetres) wide, often with a velvety sheen. The thick midrib bears five to eight lateral veins on either side. The petiole (leaf-stalk), which is two to four inches (five to ten centimetres) long, is green, stiff and stout, with a membranous sheath at the base. The entire plant is compact and low-growing, achieving a height of only about two and a half to three inches (six and a quarter to seven and a half centimetres).

*Cultivation and propagation:* Though this an elegant plant it is not ideal for the home aquarium, as it prefers to grow emersed. However, with due attention, submerged growing is possible. Low-growing and slow-growing, it will eventually develop into a robust, bushy plant.

A shallow tank with a good mulmy base is essential. Sand or clay should be mixed with finely sifted compost. The depth of the mixture should be at least three inches (eight centimetres) in order to sustain the many branching runners. The favoured water condition is acidic and soft, a pH range of 6.4 to 6.8 being the most acceptable. A temperature of 75° to 78°F is also essential for healthy growth. In humid conditions this can be grown as a pot plant.

Propagation is by means of lateral shoots, which develop rapidly. These plantlets can be removed and planted in pots with plenty of mud. As the plants grow bigger, they can be introduced into the aquarium, provided the water-level is decreased initially and then gradually increased as the plants develop.

## COLDWATER QUERIES

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my book, "Coldwater Fishkeeping". This explains the making and stocking of a pond. I am enclosing an address from which you can get any fishes or plants you require. Most water plants are not fit for human consumption; with the exception of water cress, I do not know of one and even this plant needs running fresh water in which to flourish. Fish foods can be bought at most pet shops.

**I have a number of young goldfish in my pond which were hatched in December, 1975, they are nearly two inches long but have not changed colour. When will they turn gold?**

Most goldfish in fact take about two years to change colour from the original bronze. A few may never change and in many ponds where the goldfish have been left to breed uninterrupted, some dark coloured fish are often to be seen. Such fish can breed with the others and may produce many more fish which never change. It is therefore important to remove from the pond any which do not turn gold in three years. I am surprised to learn that your fry were hatched in the month of December. I suspect that they may have hatched up to two months before but they are so tiny at first that it would be very difficult to see them when first hatched and even at a month old they could be hiding among water plants. As they grow they like to lie beneath water lily leaves and only venture forth when feeding.

# VIEWPOINT

by A. Jenno

AT THE TIME of writing this, in early July, we are experiencing what can for once be accurately described as a heatwave. After three weeks of constant sunshine and high temperatures the initial enjoyment of such conditions begins to wear off and many people find this weather to have considerable disadvantages. In this country most of our fish-keeping facilities are designed to combat cold winter conditions, so that in a hot summer as now these carefully planned systems may work against us instead of to our benefit. My own fish-house, for instance, which is completely insulated and windowless, is at the moment not a very pleasant place to be in. The inside air temperature has been above 85°F for some weeks now, but short of major structural alterations there is not a lot that can easily be done about it. The small door could, of course, be left open but then this would allow entrance to cats, birds and insects in my absence. My present attitude is to strip to a minimum for the weekly cleaning and water changing session and otherwise to grin and bear it. Fortunately the inside temperature has not yet reached high enough values to actually cause fish deaths and this is one advantage of the heavy insulation over such constructions as conservatories and greenhouses. A good idea might be a second door made of insect-proof mesh which would still allow some air circulation, and thus some cooling.

From the point of view of electrical economy, of course, such weather is ideal. The insulation maintains the high temperatures throughout the night, with the result that the tank heaters are presently redundant. The thermostats have all been off since around Easter and will stay so until the autumn, given continuing reasonable weather.

The effect of warmer water temperatures is the need to ensure adequate oxygenation to counteract the fact that water does not naturally contain so much dissolved oxygen at these values, and in overcrowded environments this effect can be significant. My crowded fry-raising aquaria show evidence of this condition so I am currently watching the air supplies very carefully. In this respect it might be better at this time of year to pump in cooler external air than to simply recirculate the warm inside air. Similarly, compressors and pumps might be better situated outside in a shaded location where they would themselves be cooler and thus able to work under less strain. Certainly in the

present conditions it would appear that my fish-house is a little too winter-orientated and that some temporary modifications as above would be commendable.

One consequence of this overheating has been the loss of some of my marine invertebrates. My mixed native/tropical aquarium is now a rather sorry sight. When the water temperature rose above 80°F many of the inhabitants wilted, but once above 85°F the Snakelocks anemones promptly died, and the Beadlets do not look very happy. The tropical anemones are not fully pumped-up and do not feed well. My small red Sea-Star died yesterday. On the other hand, the native Prawns and the two tropical Urchins seem unaffected. I feel that here the answer might be to transfer the whole population to a container in the garden every summer, perhaps a marine pool. The loss of the Snakelocks anemones was especially disappointing because they had proved to be ideal aquarium inhabitants in every way, and were one of the few invertebrates I have kept which are easily capable of reproduction in the artificial environment.

One word of advice to beginners is perhaps necessary on the subject of summer conditions. It is inevitable that most domestic aquaria will sooner or later go to higher temperatures than their heating equipment is set for, due to the rooms where they are kept becoming overwarm. Under no circumstances must thermostat settings be altered to try to counteract this. Aquarium heaters have no cooling ability and cannot correct for the influences of higher room temperatures. Where the aquarist has mistakenly altered his thermostats the result will be a severe cooling down when the weather breaks as the thermostats respond to the new lower settings. This will then often result in outbreaks of White Spot or other temperature-induced diseases.

Many more pool owners are nowadays beginning to appreciate the possible benefits of filtration systems, particularly those whose fishes are large enough to eat underwater plant life, with the result that the older concept of the so-called 'balanced' pool is now less favoured. Other aquarists simply do not understand the advantages of encouraging the development of a carpet of submerged growth, for instance of *Elodea* or Hornwort, and then tend to rely on expensive liquid additions to maintain clear water. Submerged aquatic

plant is relatively cheap to buy and easy to install, and yet almost all new pool owners ignore it in their rush to buy fancier ornamental plants, such as water lilies, and to obtain their fish population. All new outdoor aquarists, and those gardeners who use pools simply as decoration, should realise that in an unfiltered pool the most important inhabitant is always the submerged plant growth. One often sees recommendations from quite authoritative sources for the inclusion of one small bundle per square yard of pool area, or similar densities. Presumably the intervening five years needed for this to grow to a sufficiently useful quantity are considered expendable.

If any well-established clear pool or natural water is observed it will be seen that submerged plant always populates at least half of the water volume at the peak of its growth in the summer. It would therefore surely be more sensible for a new pool to have this amount included immediately than to wait for some years for it to build up. This of course involves the pool owner in buying or collecting a large amount, and this is the rub. We are all in too much of a hurry to get the fancy items and not many will spend the time or money necessary to first establish this basic requirement properly.

As regards pool filters, these are many and varied, and in most cases require home design and construction. The most commonly used filter medium is aquarium gravel or similar, used either in a biological system or simply as a mechanical strainer, or in both modes together. Some elaborate pools do have sub-gravel water circulation systems, but more often the filter is simply a large container situated beside the pool rather than in it. These patterns work well if properly designed and assembled and can require very little maintenance.

One common mistake in pool filter designs, and one which is often included in published layouts, is the installation of the system in such a way that the circulating pump moves water from the pool to the filter, the circulation loop then being completed from the filter back to the pool by gravity or siphoning. Such poor application then results in the pump working permanently in the dirty side of the system and thus becoming clogged frequently, or easily damaged, or suffering from reduced circulation through constant partial blockages. Surely it is only common sense to fit the pump in the clean side of the piping circuit where it should be able to perform its function unimpeded. The usual reason for not doing this is that, in order to ensure an automatic flow from the pool to the filter by a fall or a siphon, the water level in the filter must necessarily be the same or lower than that in the pool, which in turn means that the filter must be dug into the ground or built as an extension of the main pool. This may involve more trouble on initial installation, but the operating benefits make such an

approach much more worthwhile, and incidentally usually less unsightly. Often such a filter can be disguised as an additional small pool and will support an attractive Water Lily as camouflage.

A further point regarding garden pools is the popular notion that they should never be given partial water changes. As in any other aquatic environment, the introduction of new water is tremendously beneficial in that it dilutes toxic accumulations and that the removal of the displaced water takes away much rubbish. In unfiltered planted pools periodic partial water changes are, in my opinion, virtually mandatory. I have now run my large garden pool for a year without any new water additions and then for a further year during which the hosepipe has been put in every Sunday for at least half a day, and the results have definitely confirmed this advice, the whole pool being better and cleaner for the trouble.

\* \* \*

All aquarists will have seen or at least read of Discus at some time or another and will have seen their frequent description as the 'King of the aquarium' and so forth, but I wonder how many can actually appreciate their extraordinary qualities without actually having kept them. Seen at a dealers' they tend to be just another nice fish, but get them home and establish them in a suitable aquarium and then they really will be understood.

My own experience with these lovely fish had been exactly nil up until a few weeks ago when I suddenly had the chance to buy some young adults from a friend. This all dropped on me very quickly so it can be imagined how feverishly the subject was read up to obtain at least a background of information before taking up the responsibility of keeping the fish properly. My main reasons for not keeping Discus previously had always been the unsuitability of my local tap water and my wish to avoid complicated obligations towards such a specialised species. However, on serious investigation other simpler alternatives did suggest themselves and so far appear usable.

No doubt everyone knows that Discus require very soft water and unusually high water temperatures. It is also commonly proposed that they require acidity and fairly static water. Another criteria is that they should be kept alone, or at least only with certain other species which they may tolerate and which can live in the same environmental conditions.

Here in the Midlands we have a peculiar water supply situation in that Birmingham and its suburbs are supplied with water taken mainly from the Elan Valley in Wales, which is very soft, whilst all the surrounding country areas including my home town receive considerably harder water from an entirely different source. This allows anyone who is prepared to put themselves out a bit to choose the better of the two supplies for a particular purpose. My own tests,

using the Velda test kits, gave the following results:—

	Birmingham tap water	Tamworth tap water
KH (Carbonate hardness)	1DH	8DH
GH (Total hardness)	3DH	14DH
pH (Acidity-alkalinity)	7.2	7.3

From the above it is pretty obvious that the Birmingham tap water should be ideally soft for Discus, so for the last few weeks I have been going backwards and forwards with a large water container. This is obviously a better alternative, given this availability of soft water, than becoming involved in all the trouble of modifying my own tap water to suit with expensive and consumable de-ionising resins. At any rate, the fish are now happily installed in a large aquarium in this water.

I am now experimenting with foods. The first decision was that *tubifex* and *daphnia* are definitely out because of the water-borne complications which can accompany their use although I must admit to knowing other Discus keepers with far more experience who swear by *tubifex* especially. Certainly my Discus go mad for the freeze-dried *tubifex* cubes. Other foods

which they have so far taken avidly are small earth-worms, crumbled boiled liver and crushed peas. They do not, as yet, seem keen on trout-fry pellets.

I have opted initially for a bare-base, clinical aquarium system with power filtration using wool and carbon media, and propose to carry out weekly 20% water changes with soft water. Whether this is actually the best environment for Discus is a matter on which I am not at the moment qualified to make statements, but hopefully some definite opinions may be possible at a later date. There are nine fish, including a pair which have already spawned for the previous owner, but which I am unable to identify yet. The isolation of this pair in their own aquarium is naturally one objective. It remains to be seen whether the Birmingham tap water is suitable as it stands for the actual breeding. Most written information indicates that some acidification may be needed to prevent egg fungus, but practice may, of course, prove otherwise.

Should anyone wish to correspond on this subject, I would welcome advice or suggestions and such information could perhaps be summarised here at a later date for the benefit of all.

## INTERZOO

FROM the 14th to the 16th of May this year the world's largest international animal trade fair 'Interzoo' was held once again in Wiesbaden, capital of the federal state of Hesse, West Germany.

174 German exhibitors, together with 82 from 12 other countries, displayed products covering the whole range of animal keeping.

The exhibition showed that 'animal goods' constitute an industry the size of which would certainly surprise a lot of people. Large and impressive, it included everything from A to Z, from aquarium and terrarium animals to collars made of pearls and diamonds for four-legged pets.

The 'Dog-owning and Dog Care' section alone displayed many and varied products, ranging from ordinary plastic dog bones to a dog's coat covered with gold and bordered with ivory, costing 40,000 Deutschmarks. A well-known English firm showed play mice for cats of which it produces and sells 2 millions a year, quite apart from its other lines. The same firm offers rare items for the household aquarium, including 'Conus Gloria Maris', one of the rarest types of mussel, costing a mere few thousand Marks each.

Aquaria and accessories—for example pieces of coral—were many and varied. A famous German firm presented the largest coral in Europe. Shown for the first time at INTERZOO, and a real hit, was Scottish moor oak—consisting of gnarled, thousand year-old pieces of root of a rare species of oak. It is being

by *Lothar Fuchs*

marketed exclusively by one of the largest aquarium fish importers in Europe.

Importers and exporters of aquarium fish showed an extensive selection of their supply range, including a number of importers from the Far East who have been trying for a long time to supply the European trade.

A wide range of high-quality water plants were shown by predominantly German exhibitors. Tetra, the world's largest producer of animal foods, showed modern aquarium products. A leading firm in the field of aquarium fish hygiene and pharmaceutical products surprised many people with the adventurous design of its show-stand. Equally interesting was the animal wholesale trade with a standard assortment of parrots and cage birds but also pedigree cats and tropical snakes.

An indoor conservatory which can be used as a combined aquarium and vivarium showed varied organisational possibilities, even for the smaller purse.

There is a lot more which could be mentioned, from an inflatable dog's basket which fits comfortably into a waistcoat pocket to hundreds of different bird cages and a monster insect made of raffia and cotton.

All in all it was a truly international fair advertising the considerable commercial significance of the trade—open, unfortunately, only to industry and commerce. It would make good sense if in the future the gates were opened to the consumers, the actual animal lovers and owners, as has already happened in the case of certain other trade fairs.

# THE PIPA

by Andrew Allen

OF ALL the amphibians, the primitive frogs are perhaps the most unusual and bizarre. Most aquarists and herpetologists know the South African Clawed toad, but few are familiar with its South American cousins: the Pipa toads.

Goin and Goin suggest that there are three primitive groups of frogs—the Ascaphidae, Pipidae, and Discoglossidae—coupled to the advanced frogs and toads through the Pelobatidae. The Pipidae probably originated in Pangaea (the ancient land mass of the southern hemisphere) after Australia and India drifted away, but before Africa and America split apart. According to this scheme, they arose during the Jurassic, in the era of the dinosaurs, as a group spanning the common continent of Afro-America. Africa and South America parted company, and the two axes of the Pipidae—the Clawed toads and Surinam (Pipa) toads—slowly diverged.

The common features of the Pipidae are:—

- (1) their lack of a tongue (hence the alternative name: Aglossa), a feature that distinguishes them from all other anurans.
- (2) the presence of a lateral line, similar to that of fish, in the tadpole, and
- (3) their resolutely aquatic habits.

Certain of the Pipidae are able to move between ponds, but their mode of life is overwhelmingly adapted to the water, and they are clumsy and defenceless on land.

The Pipa most commonly encountered in zoos, and occasionally in private hands, is *Pipa pipa*, the Surinam toad. In general shape it resembles a decomposing leaf or overcooked beefburger: that is, rectangular in outline, thin in cross-section, and with crinkly edges. It shares with these items also its colour: a uniform or blotchy black-brown mulch. In other words, it is perfectly, consistently, and delightfully . . . ugly.

The unprepossessing shape and colour provide a perfect camouflage: the Pipa toad lives on and amid the glorious, black, leaf-ridden mud of the Amazon, the Orinoco, and their forest-girt tributaries.

The perfectly flat, triangular head is disguised by flaps of skin. The eyes are tiny black dots, in contrast to the colourful, protruding orbs of most anurans. The hind limbs form great fans, webbed to the very tip of the toes, powerful agents of explosive escape. With lengths of up to eight inches, the Pipa can challenge the

giant South American bufonids in the linear dimension stakes—but not in terms of volume, for the Pipa is a lamina whereas the bufonid is a ball.

Each delicate fore-limb finger terminates in a tuft of fine filaments, each filament a sensitive tactile organ. With these hypersensitive fingers the Pipa sorts through the mud, locating and disturbing items of food. As a cosmopolitan scavenger, live and dead food come alike, and in the aquarium it feeds readily on raw or rotting meat, dead or live worms, or any category of small animal, alive or putrid.

However, the Pipa is famous not for its anti-beauty, nor for its messy table manners, but for a style of maternity that is quite its own!

During amplexus, the male Pipa guides the long, flexible oviduct of the female under his body, and onto her own back. As each egg appears, he guides the oviduct in such a way that the egg is pressed against an unoccupied portion of her skin. The egg adheres. As mating terminates, her back is a patchwork of eggs, each one in a space of its own.

The female retires, and, gradually, the skin on her back swells to a thick, soggy sponge, covering and enclosing the eggs. To our eyes, she becomes an unbalanced, lop-weighted object, even more anomalous than the norm. But her freedom of movement is apparently not affected, and she lives and hunts as before, ignoring the embedded cargo. And, sheltered inside an individual cave, each egg hatches into a tadpole, changes and matures.

One day, a host of tiny 'lids' pop open, and from each cave a minute toad emerges, perfectly formed, to swim rapidly away from a mother whose reputation for infanticide is legendary.

Such parental care is rare enough among the amphibia, and in only a handful of species does the male or female 'guard' the offspring, either internally as in the Alpine salamander, externally as in Pipa and Midwife toads, or in nests, as in the Blacksmith tree frog. Nearly all amphibians, in particular frogs and toads, discharge large numbers of eggs directly into the water. The tadpoles suffer heavy mortality, and of the thousands of eggs laid, only tens or hundreds survive to leave the water.

By contrast the Pipa toad lays only 40-80 eggs, and

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Top: *Fucus vesiculosus*; centre: *Ulva*; and lower *Corallina*

THE DAY of the bright, bubbling, plastic mermaid aqua-grove is thankfully drawing to a close. More and more marine aquarists are now prepared to take the time and trouble to attempt to create a more natural-looking environment for their animals.

However, even so, very few aquarists dare attempt to grow seaweeds. This is a great pity, for there is nothing which enhances the beauty of a well-stocked marine aquarium as much as a healthy growth of living plants. And in addition to purely aesthetic considerations, living seaweed will provide homes and shelter for many fishes and invertebrates, and may indeed introduce new animals attached to their fronds (Hydroids, tube-worms and sea-squirts, for example).

There are numerous problems associated with the cultivation of seaweeds, of course, as there are with the cultivation of any form of marine life, but I believe that these problems have been frequently overstated.

Many of the difficulties encountered in growing freshwater plants are absent. For example seaweeds lack roots, having instead, simple hold-fasts with which they cling to stones and rocks, and therefore the type of

## THE ROCK-POOL GARDENER

Written & illustrated by  
Huw Collingbourne

sub-stratum or under-gravel filtration presents no problem.

Seaweeds are, in fact, no more than highly developed marine algae, having more in common with the green slime which freshwater aquarists are forever removing from the aquarium glass, than with the prize plants which they root in the gravel.

For convenience, we may divide the common shoreline seaweeds into three main groups, representatives from which one is likely to encounter on almost any area of rocky coastline.

The first group contains the green algae. These occur high up the shore, often in little pools of the splash zone, filled only by the salt-water spray of the highest tides.

The brilliant green tube-fronds of *Enteromorpha intestinalis*, or Sea Grass, is usually abundant here and frequently grows in the brackish water of rain-filled pools. In the heat of summer it may be dried and bleached white by the sun.

Another common green weed is the Sea Lettuce, *Ulva* spp., a plant with shorter, broader fronds, slightly translucent.

Both *Enteromorpha* and *Ulva* may be grown in quite small aquariums which should, however, be well lit with a powerful light source. Under these conditions



they present few problems and spontaneous growth of these plants may occur if natural sea-water is used.

Growing high up the shore these varieties have adapted sufficiently to be able to thrive in a variety of conditions and may, therefore, be grown in tropical aquaria too; and I believe that it would be well worth a try to use them in a brackish-water aquaria also.

A little lower down the shore commences the domain of the brown weed. These forms are extremely hardy and are not easily damaged. They are much more numerous than the green weeds and various varieties extend from the mid regions of the shore-line, right out into the depths and darkness of the sea. The immense thong weeds grow far out from the shore but many smaller varieties such as the seawracks of the family *Fucaceae* live far enough ashore to spend much of the time exposed to the air by the receding tide. These have immensely strong holdfasts which are capable of resisting the full power of the surging waves.

When exposed to the atmosphere, wracks may lose up to 65% of the water which they normally contain and will become brittle and black. However, when the tide returns the wrack will re-hydrate and, as it absorbs water, its usual suppleness will be restored and its colour will change back to its accustomed olive green.

The Bladder Wrack, *Fucus vesiculosus*, and the Spiral Wrack, *Fucus spiralis*, are representatives of the brown algal varieties common to tidal pools. They sometimes attach themselves to pieces of driftwood and pebbles instead of larger rocks.

They have irregular, bumpy packets at the ends of some of the fronds. These are the reproductive organs or conceptacles. Bladder Wrack is also notable for the

little gas bubbles along its fronds; these are the bladders which give the weed its name. They hold the plant upright when it is in water and are so effective that they may cause the entire plant to be carried along in a sub-marine current.

Unfortunately, although brown seaweeds are very hardy and will survive in a variety of light and temperature conditions, they are not really ideal for most aquaria, for many types are either quite simply too large, or require conditions supplied by tidal movements.

There is a smaller group of algae, however, which contains a few varieties eminently suitable for inclusion in an aquarium. These are the red algae. They tend to grow rather low down the shore and the rocks exposed at the lowest ebb of a spring tide may be found covered with a luxuriant growth of red algae such as Carageen or Irish Moss, *Chondrus crispus*, which may occasionally be seen in other colours too, such as purple, green or yellow.

Another common red alga is *Ceramium rubrum*, a fine and extremely delicate little plant.

One of my favourites, however, is the light red *Corallina officinalis*. This is a very unusual and extraordinarily beautiful alga which is covered with an armour like the finest bone china.

Growing mainly on chalky rocks, it extracts calcium from the surrounding water which it then excretes to form its brittle, coral-like covering.

Fortunately for the aquarist, *Corallina* grows well in aquarium conditions, but one must take care that its water is kept suitably alkaline. The best way to ensure this is to add a little lime water when topping up the aquarium from time to time.

## THE PIPA continued from page 225

most or all of these survive to emerge as young toadlets. The tadpoles are immune to predation, and to local physical vicissitudes. This lavish parental 'care', ensuring the better survival of fewer offspring, appears a more stable and optimal strategy than that of the average anuran. Readers of the recent ecological literature will identify the average anuran as an r-strategist (from unstable, temporary habitats), and the Pipa toad as a k-strategist (from stable, mature habitats). The prime difference, however, may lie not in the ecology of Pipa versus other toads, but in the simple fact that the Pipa has succeeded in solving a very tricky anatomical problem: namely where to put the eggs, and how best to guard them.

The genus *Pipa* includes two other members: *P. methlagae* and *P. parva*. The latter is a scaled-down version of the Surinam toad, only two inches in length; both species appear to share the general characters and

habits described earlier. Also from the Venezuela-Surinam-Brazil region comes the small genus *Protopippa*. The group is still somewhat obscure, differs from *Pipa* in minor anatomical features, and is not often seen on this side of the Atlantic.

The Surinam toad does quite well in the aquarium, sharing the general resilience and adaptability of the Clawed toad, whose requirements are better known. Feeding presents no problems. There is no need to provide landing places, and the toads thrive at room temperature or under mildly tropical conditions. The clicking call of the male will not disturb the lightest sleeper—a mercy where anurans are concerned! Pipa, however, does not make the ideal community animal. Its mouth is of considerable gape, and smaller fish, frogs, tadpoles and newts are all at risk. Conversely, certain fish and terrapins are liable to nibble or bite the delicate skin and fingers, exposing the toads to a range of dangerous pathogens. If in doubt, assume that the Pipa will play the same role in a community tank as its taxonomic and ecological cousin, the Clawed toad.

# WHAT IS YOUR OPINION?

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

Photographs by the Author



I WAS PLEASED to hear once again from Mr. Derek Chambers, of 60 Penney Avenue, Mt. Roskill, Auckland 4, New Zealand. Derek, who is now an expert at breeding discus, had the following to say: "... We got our house lifted two years ago and have built a concrete block basement, 42 ft. x 24 ft., which incorporates my 20 ft. x 13 ft. fish house. I run about fourteen tanks and they keep me quite busy. I don't bother with gravel on the bottom as the tanks are easier and quicker to keep clean. I can feed well without polluting the water. All my fish are fed three times daily, mainly on ox heart, but I feed *Tubifex* three times per week and *Daphnia* twice weekly—which keep the fish in good condition. I can get a plentiful supply of *Tubifex* from a relative's dairy farm. I have seven *Daphnia* tubs which do well here all the year round. I feed them on Biol and they do really well. Dried blood and cow or sheep manure are also good.

"I keep peat bags in the tanks to drop the pH which I keep below 6.0 for breeding. The spawn doesn't seem to fungus much in acid water. Some parents are good and eat the unfertilized eggs; and some don't. I keep an inverted flowerpot in for spawning on, and they seem to prefer it. I keep the temperature in all my tanks at between 82° and 86°F. I change a little water about three times per week. I use water straight from the tap, at the right temperature. I use rain water when I can be bothered carrying it in. Sometimes I give them a complete change of rain water.

"I have four spawning pairs of discus which are not consistent in rearing their young—with the exception of one blue/brown pair which are great parents and bring up every spawning. I find with discus that I don't have all the answers as they are a bit temperamental. My blue/brown pair and red pair spawned at the same time so I swapped the spawn over and the blue/browns brought up the red babies while the reds ate the other spawn! My spawnings average from 80 to 130 babies. The ten red Heckels I bought cost me £425 as the New Zealand dollar is worth ten shillings. I have noticed that these fish have started to show signs of pairing off. If I have any luck I'll get \$20 each for the babies at eight weeks old. I must try and take a few coloured photographs and send them to you..." (There should be food for

thought there for potential discus breeders. Do any other readers have experiences to recount of fish acting as foster parents? If so, please drop me a few lines. No doubt Derek will let us know of his progress with the red discus).

In the July edition I published a letter from Mr. Peter Fox, of 76 Lodge Crescent Waltham Cross, Herts. In his letter Mr. Fox said that he had reverted to using a German food as a new British food caused his fish always to be on the look out for more. Mr. Fox said that he didn't know if his fish liked the new food a lot or if it wasn't filling them up. Mr. Fox's comments brought me a letter from Dr. David Ford who guessed the identity of the foods mentioned and who is responsible for the research behind the British food. As this feature is open to letters and comments from all sides of the hobby, I feel we must let Dr. Ford make his points. He stated that he had written to Mr. Fox and explained that it is higher acceptance of the food by the fish and that he should feed "that little bit more." Dr. Ford, to illustrate his point, made reference to Mr. A. Jenno's *Viewpoint* feature, in the same (July 1976) issue—page 152, column two. The Doctor sent Mr. Fox some extra food and pointed out that the German food "is much—up to 25%—dearer" if one compares weights. I was interested to learn that the new British food continues to grow in popularity. At the Weisbaden show the British firm received orders from eighteen countries—including Russia. (Possibly those red flakes?) Dr. Ford kindly sent me samples of the French and German labelled versions of the British food, complete with booklets in these languages. (British foods going to Germany must mean something!) I was interested to read of recent developments regarding the proportions of lipids (oils and fats) and proteins in the British food. Further information will be available in the near future.

Mr. K. F. Gee's address is 127 Swale Drive, Kingsheath, Northampton. He writes: "... A useful tip: when refilling a tank that has been half emptied, to avoid disturbing the gravel or any sediment in its upper layers, I hold a floating breeding trap on the surface of the water and pour the fresh water from a watering can on to the bottom of the trap so that the water runs out of the slots in the ends."

Derek Readman is 15 years old and writes from

19 Park Toe, Whitby, Yorks. "... In my third tank I have a white or spotted piranha, *Serrasalmus rhombus*. It is now nearly 3 in. long and considering it was little over  $\frac{1}{2}$  in. when I bought it about four months ago I think it is doing well. It is a very lovely coloured fish and I am sometimes sorry I cannot keep it in a community tank which is, of course, out of the question. It is silver with many dots on its body. Its tail has black markings on it and its anal fin is a bright red. At the moment it's kept in an 18 in. tank but I shall move it to a larger one as it grows. It is kept at about 78°F as it seems more active and I'm told it will feed well. At first I fed it flake food and it was readily accepted; however, now it seems to dislike it. I'm certain that its good colour, health, teeth, and its fast growth are all due to its being

meat or fish. That is why one shouldn't fool about with it. I once fed it, not realising that I had just topped up the tank, and I put my hand quite a way into the tank, just missing the piranha which was waiting for its evening meal. I removed my hand faster than the piranha even dreamed about snapping at it. It is a good fish to keep as it is interesting, unusual and very colourful. If looked after correctly piranhas are no more dangerous than guppies. I can well believe that in the wild a full grown shoal of piranhas can finish off a cow in a matter of minutes." (In all cases I'd prefer to trust a guppy more than a piranha. Each to his or her own choice!).

I began my July feature with the words: "Photograph 1 shows Mr. Bob Crossan's attractive, little pond . . . ." The fact that the photograph was



given plenty of meat and live food. My fish seems to like goldfish and platies best of all; I think the bright orange colour is part of the attraction. The fish seems to feed faster in a dimly lit tank at night and not with a crowd staring at it. I have found that it is most important to remove all excess food when the piranha has settled down to digest its meal. I do not recommend lots of meat every single day. It is best to feed the fish at the same time each day and not to drop in odds and ends all day long. I find it best to tie the food on a piece of cotton and later remove it. Once I put a large platy in before going to bed and forgot about it. Next morning I bent down and lifted the tank lid. The water stank and it was very cloudy; there floating on the surface was a half-eaten, headless platy. I had to remove the platy and change all the water—which is not a very pleasant job. I will see that it never happens again.

"My piranha seems rather a shy fish: sometimes when I feed it it looks as if it has no intention of eating and then in a flash it has removed quite a large chunk of

published upside-down tended to make it look a little less attractive! The first of this month's photographs shows a pair of danios. Please send me details of how you have bred this species.

Mr. K. Mali resides at 8 Benhurst Gardens, Selsdon, Surrey, and his subject is ponds. He writes: "I have decided to build a pond during the (summer) months and, as I am going to make my own fibre-glass one, I thought my reasons and method might be of interest to you and your readers. I considered all the usual methods of pond construction and made the following decisions. I decided pond liners, although easily installed, are both expensive and virtually non-repairable if punctured. I say expensive because the pond I wish to construct will be approximately 12 ft. x 9 ft. x 2 ft. and for this size a decent liner is very dear. A concrete pond was also decided against as being expensive in material, time consuming and very hard work, although if leaks do occur they can be repaired reasonably well. A prefabricated fibre-glass pond was again expensive for a large size—although these are

very easy to repair if punctured in any way. Another drawback, for me anyway, is that one is governed by manufacturers' shapes and sizes. So I decided to make my own fibre-glass pond.

"First of all I shall dig out the shape I require; then firming the bottom and walls with either sifted soil or sand I shall place reasonably thick polythene sheeting over the entire surface. Mixing the resin and hardener into usable quantities I shall then paint this on to the polythene. The matting, which comes in pieces 3 ft. x 3 ft., will then be placed on the wet resin and rolled evenly all over. An entire layer will be put down overlapping each piece by 4 in. When this first layer has dried and hardened off a second layer will be applied in the same manner. That is what I hope to do. All I would like to know—if you can help—is, will two layers be enough? If you can see any other problems I would be grateful to hear of them." (Unfortunately I know little or nothing about the use of fibre-glass. Would the resin/hardener mixture affect the polythene, e.g., dissolve it, before the matting was placed in position? Can any readers advise Mr. Mali? I would be pleased to hear of your progress with the project, Mr. Mali.)

Ponds feature again in our next letter. It reached me from Mrs. M. E. Thorne, who lives at 1 Elmlee Close, Elmstead Woods, Chislehurst, Kent. "The reason that I keep fish is that I became interested in the aquatic life that my three children brought home from our village ponds—Pickend and Rush Ponds. I have one common goldfish and one fantail—sold to me as two common goldfish—and two Cambridge blue shubunkins. This April I had beginner's luck and they spawned. These fish are indoors; but we do have a quarter of an acre garden and my husband has just finished our 10 ft. x 6 ft. garden pool. We are now waiting for the water plants to arrive. I have thirty 1 in. long fry and I give them dry food sieved through a nylon tea strainer. Large grains go to the adult fish—which I have had for just under a year now. Guess what? My youngest son has just put his sticklebacks in my new pool!" (As I said before, I'd be pleased to hear of other readers' reasons for keeping fish.)

Mr. S. J. Haigh sends the following comments from his home at 16 Harrop Avenue, Morley, Leeds, Yorkshire. "I have noticed that in many of your letters and recent articles much has been said about artificially hatching and rearing angel eggs. I too at first found this almost impossible, and after many unsuccessful attempts at rearing them by many recommended methods, I have hit on the following method which has given me success, and which may help other readers who have not yet met with success. I use a 3 ft. tank which is bare except for a few rocks and a 10 in. x 3 in. piece of slate for the eggs to be laid on. Using my local tap water, with a pH of 6.8-7.0, I fill the tank and set the temperature at 80-82°F, and it should not be

changed through the rearing period. When the eggs have been laid the parents are removed and the eggs left in the tank. As much sediment as possible is siphoned off the bottom, but the tank is not refilled as a slight chemical change in the water might ruin hatching. The slate is then laid on its side with the air stone passing a current of water past the eggs. Most important at this stage is not to add any chemicals to stop fungus from affecting the eggs. I have found that (such chemicals) only lead to weak and unfit fry which rarely reach the free swimming stage. I find it best to lose a percentage of the many eggs to fungus and have healthy, fit fry hatch out.

"The fry should not be fed until free swimming, and then with the usual brine shrimps, sifted *Daphnia*, etc.; they should then be slowly trained to take dried food. One of the most beautiful sights to a budding breeder is a tank full of young angels. I hope this letter will help more aquarists to reach this stage."

My thanks to the F.B.A.S. for sending me the latest two editions of their Bulletins. Each contains a wide variety of stimulating items. I was particularly amused by an article entitled "Things'll get worse before they get better", taken from the Newbury Neon magazine. It began: "As the firemen hose the blood and dead fish from the floor of the Plaza, scene of unprecedented violence at the Area South's premier Annual Open Show . . ." Rather than leave you on the edge of your seat I'll let you know that the scene is set in 1984! It's encouraging to note a sense of humour in the aquatic world now and again as some aquarists who show fish tend to take things rather too seriously. My thanks also to Torbay A.S. for a copy of the current edition of *Toras Topics*. Among its varied contents is a most interesting interview with Mr. R. Fletcher, who has worked at Torquay's Aqualand and Manchester's Belle Vue Aquarium. Torquay A.S. have been sending me regular copies of their magazine for so long now that I feel I'm almost a member of the society. (It's quite a few years since I first joined an aquarium society. If I recall correctly, someone locally has a photograph of original club members and I appear in it as a schoolboy, complete with cap. I must try to contact the owner of the photograph and ask if I could copy it. Unfortunately the local society no longer exists).

The Yorkshire Koi Society, under the Chairmanship of Mr. F. J. Ayres, appears to be going from strength to strength—and the quality of its excellent magazine, "Koi", continues to be maintained. I was thoroughly amused by a humorous piece in the April edition. Entitled "Dehydrated Water", and written by David Hollom, it contained a reference to Professor W. Ater P.H. (I think I know his mother—known to her close friends as Ma D. Ater. Well, I am writing this in the heat of the summer and it is known as the silly season . . .)

Mr. Ayres, whose address is 35 Manor Drive, Hilton-in-Cleveland, Yarm, Cleveland, writes: "... Since its formation in October 1975, the Y.K.S. has grown from eighteen members to almost a hundred and continues to grow. A substantial number—over a third—of our members reside outside of Yorkshire and 'Koi' is now sent regularly to Canada, U.S.A., Australia, Nigeria and Japan. In November 1975, the Society has organised a tour of Japan to meet Japanese Koi enthusiasts and also to visit the 12th Zen Nippon Airinkai All Japan Nishikigoi Show in Osaka. Zen Nippon Airinkai is the largest of the Japanese Koi Societies with a membership of over 8,000! They also publish a superb magazine in English—called 'Rinko'. This is published four times per year and in addition to publishing information on Koi, contains full colour plates of winning fish from local and national shows.



'Rinko' costs 9,000 Yen (about £16-50) and can be obtained from Zen-Nippon Airinkai, Room No. 401, Fujii Building, 1-2 Mochigahama, Beppu-City, Oita-Prefecture, 874 Japan.

"Together with the Midland Koi Association, who also subscribe to 'Koi', the Society has formed the Association of British Koi Societies. The Association, which is open to all local societies primarily interested in Koi, was formed as a vehicle to enable local societies to operate in complete autonomy but unite together when necessary. Further details of the Yorkshire Koi Society can be obtained from this (Mr. Ayres') address." (The April edition of 'Koi' contained a breakdown of the cost of four Koi actually imported from Japan on 15th October, 1975. The cost of the fish, in Sterling, at source, was £288-14; when freight, import duty, airline handling charges, VAT, etc., were all added, the total bill came to £489-79, making the cost of each fish £122-45, compared with a cost at the Koi farm of £72-03—an increase of 70%. And I thought marines and discus were expensive!

I hope the four Koi in question are thriving, and spawning furiously...).

Photograph 2 shows an attractive female guppy. Have you tried improving the colour of female guppies using male hormones?

No. 69 Marlborough Way, Ashby-de-la-Zouch, Leicestershire, heads a letter I received from 15 years old Paul Smith. He wrote: "I read your July feature and I wish to answer your request for information about the photographed fish, *Pangasius sutchi*. A year ago I bought a *Pangasius* catfish for £2-50. It was then 5 in. long. I housed it in a 4 ft. community tank with a great variety of fish, including mollies, gourmies, platies and an assortment of small tetras. The tank had heavy rocks and plants, thickly and imaginatively positioned. I have found that this aquarium design does not suit this particular fish as it is very

strong and has an amazing turn of speed. When touched or greatly disturbed it dashes from one side of the tank to the other, unconcerned if he eventually sends the plants or the heavy rocks flying. Unfortunately I have to keep it in this situation due to lack of space. He spends most of his time lying, in any position, in the corner of the aquarium, seemingly asleep. The fish ignores *Daphnia*, *Tubifex* and the best flake foods introduced into the tank in any shape or manner. I don't know if this is true in all *P. sutchi* but mine seems to be nocturnal. Midnight visits to the aquarium prove that he is a great worker, rooting about in the gravel for food. I have found that this is an interesting fish to keep—if kept in suitable conditions, respecting its nervous disposition."

Michael Brennan is 16 years old and his home is at 4 Vale Road, Oatlands Park, Weybridge, Surrey says: "I have a male Mozambique *Tilapia* in a 36 in. × 15 in. × 15 in. tank which he shares with four angel fish and a breeding pair of *Corydoras paleatus*. During the past few days the *Tilapia* has shown great

interest in the female catfish. He follows her about watching her every move. If the catfish goes under a rock the *Tilapia* waits for her to reappear. Sometimes he even shows sexual activities towards her by going very dark—black body, red lined dorsal and white bib—and shaking very violently. Have any other readers seen this before? Any reader who doesn't believe this is quite welcome to visit my house to watch the fish."

Occasionally, including once in the past couple of weeks, I receive letters from young readers who would like to become professional ichthyologists working with tropical fish. They are keen to know of colleges or universities offering appropriate courses. I know of a few centres where zoology departments offer courses which include the study of fish; but I know little about any opportunities in Britain for such professional scientists. If you know of any such professional people, or of courses provided by specific colleges or institutes, please drop me a few lines so that I can pass on such information. Are there any openings for ichthyologists in the U.K.?

During the summer months I always note a decrease in the number of letters from adult readers, and an increase in letters written by younger aquarists. As the vast majority of the latter letters are from boys, it makes a pleasant change to be able to include a letter from a young lady—14 years old Miss Helen Rhodes, who lives at 39 Sheep Cote Road, Whiston, Rotherham, Yorkshire. Helen writes: "I have been keeping fishes for nearly two years. I have always had one or two angelfish in my community tank, but recently a large, silver female paired off with a large, marbled male. They spawn regularly every two weeks. Funnily enough, this is usually before the fortnightly meeting of the Rotherham and District Aquarists' Society, of which I am a member. I feed my fish blood worms, F.D. and flake foods, plus mosquito larvae and *Daphnia* sometimes. They also get some scraped liver from the Sunday chicken.

"I first noticed the spawning on the undergravel filter pipe in one corner, but unfortunately the male ate the eggs before they could be removed. A fortnight later I came home from school to find that they had spawned on a fairly large *Cryocoryne* plant—my centre piece! They were furiously fanning and guarding the eggs and had herded all the other fish to the opposite end of the tank. The temperature was 82°F. A 60 watt bulb was being used for seven hours per day. I had previously used a 40 watt bulb, but it had 'gone' and was replaced by the only spare bulb in the house. Also, the tank is sited in a well-lit place. Unfortunately the eggs fungused before they could hatch. Although the water was soft, it was also alkaline. This may have been the reason for their not hatching. The pair are large, but also very peaceful. Except for the herding of the other fish at spawning time, and the chasing off of another female angel, not a fish is

molested. I am going to set up a separate tank for my angels, this time using an ion-exchange resin. I will let you know of the results. Keep up the good work with the magazine."

Mr. W. J. Andrews resides at 23 Hurleston House, Grove Street, Deptford, London, S.E.8. He states: "Following your question about the necessity of plants in aquaria, may I say that I have very recently 'discovered' aquatic plants. I was recently about to set up a new 25 gallon tank and decided, partly as an experiment, to turn it into an aquatic garden containing a few colourful tetras. So far I have spent nearly £25.00 on exotic plants for this tank; but I consider this money very well spent as I can only liken this set-up to a living Constable painting. The lighting, by the way, is from a 100 watt bulb on for about 15 hours per day. Plant fertilizer tablets were mixed with the gravel and liquid fertilizers were invaluable in helping to establish the plants before the fish were added. I have now almost completely turned my long established 60 gallon tank into a similar garden set-up, the huge expense of which has been partly off-set by the sale of my now redundant Eheim's.

"An unexpected event following the heavy planting in the 60 gallon tank was the successful rearing of a healthy brood of youngsters by my *P. kribensis*. This tank contains, amongst many others, 4 full size angels, a pair of adult firemouths, and four 3 in. long tiger barbs! This was my first success with egg-layers. The fry remained with their parents for three weeks before removal. May I mention the spawning of the 'kribs'? I took a 5 in. flowerpot (plastic) and cut a hole about the size of a 50p piece halfway up the side, with sealer round the sharp edges for protection. The pot was then placed upside down in the gravel at the front of the tank. The 'kribs' immediately took over and the female cleaned out all the gravel from inside the pot. Eggs were laid on the bottom glass and I could observe the development from the underside of the tank. After the fry were free swimming I noticed an amazing ritual every time the main light was switched off at night. The male guarded the fry under a nearby group of *N. stellata* while the female kept swimming around the flowerpot and investigating the inside. All other fish in the vicinity were attacked—although no harm was done. When the coast was clear the male approached with the fry, and after a further look inside the flowerpot the female picked up each of the fry and placed them, one after the other, in the high flowerpot entrance. The fry at this stage rarely left the bottom.

"When the last youngster was safely away, the female followed the fry inside with the male taking up a position outside the entrance where he remained all night. Anyone heard of such an unusual behaviour pattern? Now, a moan about aquarium shows and, in particular, that part of the show which seems to attract

a collection of bizarre hardboard shapes with the odd bemused fish peering at an equally bemused public from all kinds of peculiar positions. This section of the show should be replaced by something to promote the hobby. I would suggest that the organisers supply each competitor with a space—say 5 ft. × 2 ft.—and one electric plug point. The competitor would be invited to submit 'An aquatic arrangement to grace the living-room of the most discerning household.' The rules would be, say, tank size—minimum 25 gallons, maximum 40 gallons; lit; heated; planted; using outside power filter; U/G filter; and at least one aerator. Marks would be awarded for: exterior design, style and safety; interior decor—fish, plants, rocks, etc.; quality of fish; and quality of plants. Perhaps separate sections could be provided for cold-water and marine aquaria. Finally, a word of thanks for your very interesting feature. The comments of other aquarists, and details of their experiences, are most useful and interesting; but I must defend the 'rules' of fishkeeping knocked by you in the June edition. Whilst many experienced aquarists can bend some of the rules without fear of disaster—although we only hear of the successes—a beginner could find himself in all kinds of trouble if he didn't go by the book at all times. Sometimes I feel that a few so called 'experts' should go back to the basics to see what they have forgotten. A look at your magazine's excellent 'Beginners' Corner' article in the June issue, which sets out the correct plant/fish ratio, would preclude the need for many an aquarist to spend a fortune on the expensive filters loved by all of the experts... Which is where we came in!"

Mr. Stephen Pember is 19 years old and writes from 12 Routh Avenue, Castle Donington, Derby. "I have been keeping fresh water tropicals for just over a year. I recently purchased four medium sized neon tetras which were subsequently introduced into a 36 in. × 12 in. × 12 in. aquarium filled with mature tap water. This also contained a clown loach and three smaller neons, and was planted with *Vallisneria*, wisteria and Amazon sword plants. The water temperature was 78°F and the tank was illuminated by a 2 ft. × 30 watt strip light. The following morning I noticed three of the neons were fighting over the fourth one, which was bulging with roe. I also noticed that one of the three fish—which must have been males—would dart alongside the female; they then trembled together and I observed about ten small, transparent eggs falling through the water. This took place for about two hours; by which time all the spawn had been released. Unfortunately no fry materialised and I presume the eggs had been eaten.

"I have since further stocked the tank with a black shark, ornate tetras and harlequins, and surprisingly the neons have spawned again. This tank is situated in the hall, on the bottom tier of a stand that also

houses a 36 in. × 15 in. × 12 in. aquarium in which I keep a red tailed black shark, giant danios, angels, lace gouramies, blue gouramies, serpaes tetras, a pair of black widows which spawn regularly, and a species of bristle nose catfish—sold to me as *Plecostomus plecostomus*—which is excellent at clearing algae, but eats most of my plants. Both my tanks employ U/G filtration which, in my opinion, is excellent. Neither of my tanks receives any direct sunlight; each is illuminated for 12 to 14 hours daily. I have kept tanks in my bedroom, which receives some direct sunlight, and they have been plagued by algae which ruins their appearance. My tanks are aerated for 24 hours daily in very cold weather so that cold layers of water do not form; otherwise the aeration is switched off every night. Finally, I feed my fish on flake foods, *Daphnia* and *Tubifex*, and all do extremely well on this type of diet. Also, I find that a lettuce leaf, boiled for one minute, weighted and placed in the tank is relished by my larger fish." (An interesting letter, Mr. Pember. While chatting with a friend today I was informed that he now fed his large, vegetarian fish on whole lettuce leaves. The friend, Mr. Maxie Burns, of Books Etcetera, used to feed his fish on torn up pieces of lettuce; but they can now feast on whole leaves, tearing off a meal of an appropriate size. No wonder he doesn't try to keep plants in their tank.)

We close this month's feature with part of a letter from Mr. I. G. Bave, of 87 Aspen Gardens, Hammer-smith, London, W.6. He writes: "...Recently I have been using the much publicised fish food sold in sealed containers, made by sh-h-h—you know who. If the enthusiasm shown by the fish at feeding time is any criterion, then it must be good! Regarding your query about an easily propagated plant for the aquarium: I think possibly *Hygrophila* is as good as any. It has a thick stalk with large, light green leaves some 4 in. to 5 in. in length. When it grows above water level the tops can be nipped off and re-planted. They will soon take root. It is a prolific grower. Snails, however, must be omitted from the tank as they seem to attack this particular plant more so than others.

"I was recently told of a strange happening of how an ex-aquarist came to take up the hobby once again. By profession he was an interior office designer. During last October he was detailed to look over a suite of offices that had been vacant for about five weeks. To cut a long story short, in one office he found a built in tank containing about five inches of murky water—but minus rocks, heater, lights etc. At the rear of the tank he found a black shark that was about six inches in length. With the aid of an empty sweet jar he transported the fish home. Fortunately he had retained one of his tanks complete so he was able to

*Continued on page 237*

# OUR READERS WRITE

## Red Devils and Esoteric Knowledge

With reference to the article "The Red Devil" by Jorgen Hansen and Pamela Stewart (*The Aquarist and Pondkeeper*, July 1976), I feel that I must write to correct a number of very glaring errors made apparently due to lack of research about these fish before the authors committed pen to paper, and to add one or two snippets of information which your readers might find of interest.

Firstly, the authors include *Cichlasoma dovii* in the group of cichlids called red devils. This is incorrect as *C. dovii* is a member of the Parapetenia group, quite distinct from the Amphilophus group that contains *C. citrinellum* and *C. labiatum*; anyone who had seen both sets of species could not fail to notice their distinctness.

There were certainly more than four different species which could be confused with the two red devils. These were *Ampholophus froebelii* Agassiz 1859, *Heros labiatus* Gunther 1864, *Heros lobochilus* Gunther 1869, *Heros erythraeus* Gunther 1869, and *Cichlasoma dorsatum* Meek 1907. All of these, under a recent review of the group by Barlow and Munsey (1976) are now referred to *Cichlasoma labiatum*. Additionally, *Heros citrinellus* Gunther 1864, *Heros basilaris* Gill and Bransford 1877, and *Cichlasoma granadense* Meek 1907, are all now synonymised with *Cichlasoma citrinellum*. Thus, there are only TWO species of red devils as opposed to the eight previously thought.

However, in addition, Barlow and Munsey describe a new species, *C. zahoum*, from Lake Apoyo, Nicaragua; an open water species that is probably plankton feeding as it has a small mouth. It is unlikely to be confused with either *C. citrinellum* or *C. labiatum* being bluish or greenish grey and more elongate. Barlow proposes the common name "arrow cichlid" for this fish.

I would question the statement that "some species have large thick lips, while others have thin lips". The degree of lip development in both species varies considerably with environment and geographical area. In nature, all *C. labiatum* have fleshy lips as do some populations of *C. citrinellum* (not those from the Great Lakes of Nicaragua). In the aquarium, such lip development regresses, in *C. citrinellum* completely,

becoming indistinguishable from thin lipped individuals.

The colour does not vary according to species; the species are polymorphic, each can occur in a number of different colour varieties or morphs. Indeed, individual fish change colour through their life history, from grey, barred juveniles, to yellow, pink, orange or red through a blotchy phase. In captivity generally orange individuals fade to lemon, red ones to pink; aquarium raised specimens never reach the full colours of wild fish due to lack of pigments in the diet. Adding pigments to the food helps, but is never 100% successful for some reason.

The fact that *Cichlasoma citrinellum* "nourishes its young in the same manner as discus fish" is hardly news. This fact was first reported in the scientific literature in 1968, and has been much studied by David Noakes and George Barlow since then (Noakes, 1973; Noakes and Barlow, 1968, 1973a., 1973b.). By studies in the wild, Noakes and Barlow found that there was a lower rate of contacting by young in Lake Jiloa than in Lake Apoyo, the former having a more luxuriant growth of encrusting algae that the young could feed on than is found in Lake Apoyo. Thus, this behaviour is facultative, depending on the amount of other food present.

Nor is *C. citrinellum* the "only know *Cichlasoma* species until now" to exhibit this behaviour. In my opinion, this behaviour is inherent in all South American Cichlids, but only manifests itself in conditions of extreme food deprivation in the majority of species, a condition that rarely occurs in the wild, and almost never in the aquarium, where ample supplies of brine shrimp and other foods are usually available. Other species where parent contacting has been observed to occur, together with the most informative reference, are presented in the table below:—

Species	Reference
<i>Symphysodon aquifasciata</i>	Skipper & Skipper 1956a, 1956b, 1957.
<i>Etioplos maculatus</i>	Ward and Barlow 1967
<i>Cichlasoma citrinellum</i>	Noakes and Barlow 1973b.
<i>Cichlasoma managuense</i>	Noakes and Barlow 1973b.
<i>Cichlasoma beani</i>	Noakes and Barlow 1973b.
<i>Cichlasoma spilurum</i>	Schein 1968
<i>Cichlasoma spilurum</i>	Stratton 1968
<i>Cichlasoma nigrofasciatum</i>	Myrberg (in Noakes and Barlow 1973b.)
<i>Cichlasoma biocellatum</i> ( <i>octofasciatum</i> )	Wickler 1973
<i>Astronotus ocellatus</i>	Wickler 1973/Sterba 1962
<i>Crenicichla saxatilis</i>	Griffiths 1976
<i>Aequidens portalegrensis</i>	Sellick (in press)

Finally, your authors would like to know where to collect these fish. I would suggest that they wouldn't catch many in Costa Rica, although *C. citrinellum* does occur there, but all the Nicaraguan lakes, with the



exception of some crater lakes, would yield specimens; Lake Nicaragua itself in the region of Granada is the most accessible: specimens have been caught in Lakes Masaya, Nicaragua, Jiloa, Apoyo, Managua and certainly others.

Yours sincerely,  
IAN C. SELICK,  
Secretary,  
British Cichlid Association,  
Editor, 'Cichlidae'.

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Our statement that at least four different species of red devils exist, together with the statements with

regard to lip thickness and colour variations, were taken from the looseleaf edition of Exotic Tropical Fishes pages F.180.20 and F.180.21 (taken from T.F.H. magazine). Unfortunately we wrote this article at the end of 1975 before publication of the review mentioned by Mr. Sellick synonymising the various species (Barlow and Munsey 1976).

We can well understand that Mr. Sellick is indignant as to our presentation of the material on contacting behaviour in *C. citrinellum* as he, since Nov. 1975, has been in possession of a Council Award to study, amongst other things, these very aspects of behaviour in South American cichlids and it is thus everyday knowledge for himself; however, we would suggest that this information is not generally known to aquarists as opposed to research scientists such as Mr. Sellick. As Mr. Sellick states, contacting behaviour "almost never" occurs in the aquarium; it thus seemed valid to describe the experiment conducted in Denmark's Akvarium.

We are very grateful to Mr. Sellick for his detailed information and especially for his fine list of references. We are indeed well aware that we sometimes suffer from a lack of knowledge of the latest research. Although we have a fine library here in Helsingør, Denmark, whose librarians do their best to obtain for us the latest reviews and journals, which are mostly sent from the libraries of the few Danish universities with zoological departments, it generally happens that about half of the material we order is not to be found in these libraries.

Yours sincerely,  
PAMELA M. STEWART  
JØRGEN HANSEN.

#### Opinionated Thermometers

You may feel that the following is of interest to fellow aquarists.

I had occasion recently to check the temperature of one of my 5 tanks. I used a popular blue mercury thermometer for the purpose, and obtained a reading of 74°F. As a matter of interest, I placed an identical thermometer alongside it, and after waiting a few minutes, took the reading, which showed 79°F. Being somewhat alarmed, I placed a 3rd mercury thermometer alongside, and obtained a reading of 72°F. I believe that at that moment I stumbled on the answer to the question of why some of my plants thrive and others die, why some of my fish are lethargic and others slow-growing, why some breed and others don't etc., etc.

Feeling determined to resolve the problem, I went along to my local aquarist shop and asked him for an accurate mercury thermometer, regardless of cost. He recommended the type I had used in the above experiment. I informed him of my findings and he rather

*Continued on page 237*

# THE RAM



Written & Illustrated by Jack Hems

This pygmy cichlid from the Rio Orinoco basin was first introduced to tropical aquarists in 1948. I hasten to emphasize the word 'pygmy' because at full size the ram measures not more than about 1½ in. No doubt some reader will write in to inform me that his fish are 2½ in. There is ample evidence, however, to show that under different conditions almost all fishes kept in the aquarium or bred in captivity vary slightly in total length as they do in, say, their more habitual coloration and behaviour. However, to move on.

Sexing the ram raises no problems. The male is the larger and more brightly coloured of the two. Moreover, his dorsal fin is grander looking than that of the female. Further, the second ray is quill-like and prolonged.

Albert J. Klee, an American aquarist, with not a few academic qualifications to back up his highly informative writings on aquarium subjects recorded in a 1971 issue of *The Aquarium* (sadly no more) that the generic name of *Apistogramma* (for the fish we popularly call the ram) is, almost certainly, incorrect. According to Klee, the *Aramirezi* of the aquarist is in all probability a midget-sized species of *Geophagus*. Indeed, several years ago the formal name of *Mikrogeophagus* was proposed for the fish. Be all this as it may, I leave the intricacies of nomenclature to those better qualified to handle them than myself.

The ram has some orange-red colour around the snout. A blackish to blackish blue bar or blotch is present on the upper part of the body just behind the head. A blackish marking extends in a graceful curve from the top of the head, through the red-rimmed black pupil of the eye, to the lower part of the gill cover. For the rest, the markedly pinkish to lavender sides are adorned with pale blue to darker bars that come and go across a similar coloured horizontal stripe. The ventral fins are red, with black leading rays. The first two or three rays of the dorsal fin are black. The other rays, as in the caudal and anal fins, are orange

to red. There are some green-blue to blue, or lavender-blue, spots in the major fins. Under a good light similar coloured metallic spots twinkle on the gill-covers and scales.

There is a golden variety of the ram. A remarkably pretty fish, in which the metallic lights show up well against the pale golden to golden pink ground. Then again, if I remember right, there is a white or nearly white ram.

Some twenty-eight years of domestication has made the ram quite accommodating in regard to the chemistry of its tank water. All the same, the fish usually looks most comfortable in water which is soft and neutral to acid. *Aramirezi* is tolerant of plants, and indeed, settles down more readily in an aquarium thick with greenery than the other way around. Another important requirement is a temperature in the upper seventies (°F). Food is more readily accepted alive. The smaller live foods are preferred such as whiteworms, tubifex (well-washed before feeding as a preventive measure against introducing disease) and, during the summer months, the ubiquitous gnat or mosquito larvae which hatch from the sooty black egg-rafts deposited in almost every water-filled container placed outdoors. If live food is in short supply, then offer the fish finely shredded raw red meat and crushed dry flake.

Spawning is heralded by the usual enhanced coloration on the part of the male and swollen lower sides and abdomen of the female. Further, she produces an egg-depositing tube or ovipositor from her vent.

A tank of about 18 in. by 10 in. by 10 in. is large enough for a couple to live in and raise young. Spawning is not confined to a flower pot turned on its side or a sort of cave made of pieces of slate. Eggs may be deposited in furrows excavated in the compost, on pebbles, even on sturdy-bladed plants. For breeding a temperature of not less than 80°F (26°) should be

maintained, that is over the whole period of courtship through to the hatching of the young and for a few weeks after.

The ram is an unpredictable fish when it comes to perpetuating its kind (in the aquarium). Some couples make good parents. On the other hand, there are those given to cannibalism. They gobble up their eggs or newly hatched young in next to no time. Hence it is a good plan to remove the eggs deposited on a movable object to another aquarium with old water of roughly the same hardness and pH value and temperature as the water in the spawning tank. Then colour it with a drop or two of methylene blue to inhibit the development of fungus. A stream of air bubbles ascending through the water is an advantage. It keeps the water moving and well-aerated and gives the fry a better start in life. Ordinarily incubation of the eggs is completed in less than 48 hours. Within the space of a week, the baby fish are searching around for food. Large infusorians, freshly hatched brine shrimps and micro worms are among the miniscule live foods recommended. If the eggs are left with good-natured parents, the female or the male or both stand

guard over them, and over the cluster of fry as they hatch. If a couple of rams spawn in a small community tank, the other fishes will be fortunate if they get off without a few bruised scales or a torn fin or two. For they are simply not allowed to swim too close to the spawning site. It is customary for the parent fish to move few days' old fry from place to place until they are strong enough to strike out on their own. As a rule, the very young fry are herded into hollows in the grit or sand.

The ram does quite well in a community tank provided its companions are inoffensive and keep themselves to themselves, particularly, as mentioned above, at spawning time. Essentially the ram is a bottom liver and likes to play hide-and-seek in the plants. It is not a species noted for its longevity and its usual life-span runs to about two years.

Although *A. ramirezi* is usually called the ram, it also bears other popular names such as butterfly cichlid and Ramirez's cichlid. One more word. It always displays better colours in a tank that is well-lighted than in a tank lighted just sufficiently to keep the plants alive.

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## WHAT IS YOUR OPINION?

*continued from page 233*

house the fish. For a few days it showed little interest in life and would not eat; but after a while it began to move around the tank. Later it began to take food. The fish is now in full health and is growing. Other fish have been introduced into the tank and though it leaves no doubt as to who is boss it does no actual harm to the other inmates . . ."

I was most interested to hear, on the news, that the Russian astronauts orbiting the earth have live fish with them in their spacecraft. I understand the aim is to breed fish which, on future flights to other planets, could provide home-grown food for the space travellers. ("Home-grown" is a rather inappropriate term to have used in the context of space travel!) Do any readers know what type of fish are being bred in space? I wonder if it's our old friend the guppy?

Please send me your opinions on the topics below

for a future feature. Please remember to PRINT your name and address on letters; to PRINT the correct names of fish; to date your letter; and to keep it reasonably short. (I have an interesting ten page letter beside me but if used it would take up several pages. I hope to be able to use parts of it in future editions.) Topics for discussion: (a) *Pterois* species; (b) Unusual behaviour of specific fish; (c) Uncommon livebearers; (d) The cultivation of spatterdocks; (e) Public aquaria you visited while on holiday; (f) Who looked after your fish during your holiday and how well did the fish survive? (g) The cultivation of *Rotala*, *Samolus* and *Blyxa* species; and (h) The cultivation of live foods such as white worms, *Daphnia*, fruit flies and *Tubifex*. I hope you will drop me a few lines now that things are almost back to normal after the summer break. I shall look forward to being able to publish your opinions.

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## OUR READERS WRITE

*continued from page 235*

sceptically agreed there and then to check the accuracy of the thermometers in his own tanks. We used 5 in all, placed at the same level in the same tanks, and obtained stable readings between 73°F and 82°F. I left the shop feeling utterly disillusioned.

The implications of the above to the serious fish-keepers, particularly the marine aquarist, are obvious. Tank-water temperature can be extremely important

to the well-being of fish—if you're having problems, the temperature in your tank may be nothing like that you think it is.

Yours faithfully,  
S. J. BAKER,  
38 Hartopp Road,  
Melton Mowbray,  
Leics.

# From a Naturalist's Notebook

by Eric Hardy

VISITING LAKELAND recently I was interested to find another haunt of crayfish in the roadside ditch approaching Kentmere, above Kendal, where the lane comes up from Staveley. It is opposite Long Houses, above the old mere. Excepting for some haunts in Cumbria, this freshwater crustacean has few natural haunts west of the Limestone Yorkshire Pennines. It occupies some streams running into Windermere and tributaries of the Eden near Melkinthorpe, as well as the upper Ribble down to Whalley and Low Moor.

Chemical communication has been shown to be important in the maternal care of young crayfish. The female carries her eggs and subsequent larvae on her abdominal pleopods, though they leave her occasionally to feed. They finally leave her protection a few days after moulting into their 4th stage. Little, a New York State University biologist, showed that 3rd stage larvae taken from a brooding female and placed in an aquarium with the same female, and with other non-brooding adults, are chemically attracted to the former

Without her protection, other, non-brooding females would devour them. The larvae recognise their mother by her chemical excretion, probably akin to the way lobsters and crabs have chemical sex-attractions for mating. They even find their way back to their mother through a maze, even when offered the alternative of non-brooding females or males. However, they are as easily attracted to other brooding females as to their own mother, so the chemical is common to the species, not exclusive to each brooding female.

A new family of amoeba, with fine pseudopodia, was described recently to the Linnaean Society.

European lizards (*Lacerta sicula*) have been established on U.S.A.'s Long Island. Russian workers have recently shown a connection between the skin-patterns of certain reptiles and body heat-control; and Germans a cleaning symbiosis between Galapagos tortoises and Darwin's finches there to their mutual benefit. Americans have shown that parietal (dorsal) eyes aid lizards to live successfully at higher altitude than those without them, which are restricted to low altitudes. Altitude also affects the sexual cycle and fat-deposit of tropical lizards.

I mentioned recently the predation by marsh-harriers upon frogs. The herring-gull is also among birds preying upon frogs, particularly in Finland. Not that birds are always destructive to waterlife. Wild duck drinking for instance play an important part in the distribution of phytoplankton, the algal bloom of lakes.

It has been a wonderful summer for water-lilies with great expanses of white and yellow kinds by the reserve at Cheshire's Great Budworth Mere, on Knutsford's Tabley meres, etc. In July, I visited probably the county's best aquatic plant haunt, the lily-pool in the Cheshire scouts' pinewood camp at Sandiway, Delamere, a short distance down the left "No Through Road" off the A47, just south of Cuddington cross-roads. Here a mass of white water-lilies and cotton-grass was edged with a red glow of round-leaved sundews and masses of tiny yellow flowered lesser bladderwort. Both the latter are carnivorous plants, making up the local shortage of nitrogen by catching insects and rotifers, etc., respectively. The extinct gullery-pond across the camp by the disused railway at Abbots Moss (now a country walk) and nearby Oakmere, now harbour less bladderwort than they used to show us prewar. Masses of cranberry border the



Female Crayfish with eggs

lily-pond. Common bladderwort grows in Cheshire in Raby nursery ponds, etc., in Wirral's Raby Heath Lane. Greater bladderwort abounds in the Fenside dyke's of Norfolk's Bartoo Broad, below Catfield. The intermediate species grows at Afon Soch in Caernavonshire's Lleyn peninsula, and the lesser kind at Ellesmere (Shropshire) meres and Cumbria's Grassgarth, between Bigland Tarn and Grange.

How lethal is the British adder? In a survey for the British Medical Association, Dr. H. Allister Reid, of Liverpool School of Tropical Medicine, found over 30 times more deaths from bee and wasp stings than from adder-bites here since the war. In fact, only 14 fatal adder bites are recorded in the past 100 years. Most bites, he states, occurred with men who picked them up, 62% in June-August, and chiefly in the south.

More surprising is that no effective antivenom was available for it until the National Health Service approved Zagreb antivenom in 1969. One child's death was due to the antivenom used. A man was bitten and poisoned when picking up the severed head of an adder, 20 minutes after it was cut off. Such a head has reflex actions up to an hour. Dr. Reid recommends aspirin or a little alcohol to calm a victim, but not to cut the bite, and to tie a ligature above it only if the patient cannot be got to a hospital in half an hour. Move the bitten limb as little as possible.

About 250 poisonous snakes exist in the world, but one should emphasize that many non-poisonous snakes bite, possessing even more teeth than the two fangs of the venomous species. I was once organizing the collecting of specimens for the Middle East Biological Scheme at the end of the last war when 2 Army medics phoned me to ask if the Syrian black snake (which is light grey, not black, a confusion when the original description was from a specimen darkened by preservative spirit) were poisonous. I replied in the negative. Later that day they phoned stating both were bitten when handling it, and I should have warned them. Bites are not only most numerous in Britain in summer because our snakes hibernate in winter, but the warmer the ground, the quicker their reactions. On the colder rocks and soil of spring, newly emerged snakes are slower and more easily photographed. A man was once bitten by an adder when gathering watercress (a more normal haunt of grass-snakes) at Cannock Chase.

At the time of writing, the Dangerous Wild Animals Bill, which will make the keeping of poisonous reptiles subject to licence from local authorities, is awaiting Royal Assent, when it becomes law. A Berkshire man recently bitten by his "pet" rattlesnake caused an emergency police transport of anti-venom from the Liverpool School of Tropical Medicine's "bank" I mentioned the other month—because Berkshire hospital had used the total stock available from the

centre. Liverpool and London centres give coverage for all known venoms. Until the new law there is no knowledge of all the dangerous species kept privately and the coverage required.

After last year's drought losses, rescue arrangements were better able to help the natterjacks through this year's repeated drought at their breeding haunts on Ainsdale (Southport) dunes. With the help of schoolchildren, several new pools were dug and the majority of tadpoles saved from the Cabin Hill area of Formby's Range Lane dunes, a site which, for the second successive year, produced very large numbers of toadlets by early July. Lesser water-plantain, one of the regular dune plants, is now abundant in the new natterjack ponds on Birkdale dunes. Many pond-plants flowered profusely this July: like flowering rush (which isn't a rush) I noticed in private ponds at Thornton Hough, in Wirral. Wild parsnip proliferated in many wet places. Dragonflies appeared more numerous than usual, especially the blue needle or damselfly. Even in industrial Merseyside the larger *Aeschna cyanea* and *A. juncea* were numerous at the few surviving ponds at Kirby, of *Z Car* TV fame.

Pond-keepers breeding goldfish and other fish might find the predatory larvae of these dragonflies, *Dytiscus* water-beetles, etc., attacking future fry, should any of this year's surplus insects lay at their ponds. Dragonflies fly by day and roost in the reeds at night; the water-beetles fly at night. I was once brought a yellow-bordered *Dytiscus* water-beetle caught one autumn night at the top of Blackpool Tower, attracted by the illuminations.

A press statement that "pink shrimps are no longer found in the Thames and Morecambe Bay," referred to commercial quantities, not the total extinction of *Pandalus montagui* in those waters. It was quoting from the Ministry's recent fishery forecasts. The decline of this sex-changing crustacean is part of the normally erratic history of its populations, linked with its main food, the small polychaete worms under 4 cm., called Sabellaria or "ross" which are often destroyed by the heavy wooden bobbins on modern shrimp-trawls. Over-fishing is another factor; this also wiped out areas of the small queen scallop in recent years around British coasts.

#### Missing Trophy

Would any member of the Farnworth Aquarist Society, knowing Mr. L. Stock, please ask him to return the barbs trophy won at the 1975 Blakeborough's A.S. open show, as soon as possible.

Also if anyone knows his present address could they inform me at the address given below.

Yours faithfully,  
E. GARVEY,  
37 James St.,  
Brighouse,  
W. Yorks.

# BIG IS BEAUTIFUL

*by Bob Purdy*

IT WAS ONE of those offers that you can't refuse and after much "discussion" with my wife, I still went ahead and obtained a six foot tank and stand together with a power filter, gravel and rocks, heaters and thermostat. I had to promise to redecorate the room before I set up the tank and, of course, this was stretched to a new carpet and new curtains. Finally came the big day.

The room I intended to put the tank in was three stories up; it has a wooden floor that seemed quite sound but I had my doubts. I calculated that the tank, when filled with water, gravel, rocks, etc., would weigh around about one ton and this had me considerably worried. I also intended to place a four foot tank in the bottom recess of the stand and this, I found, would give an overall weight in the region of one and a half tons, quite some weight for a wooden floor to support.

It was obvious from the start that the weight would have to be spread as evenly as possible and allowed to rest across as many beams as was reasonable. The problem was solved by acquiring two pieces of quarter inch thick steel plate and placing one under each end of the stand. To ensure that more than one beam was used to support the total weight it was necessary to position the tank and stand as shown in the diagram.

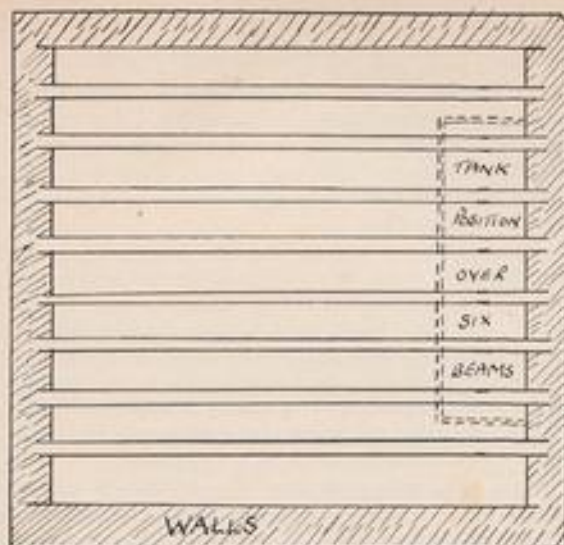
From the diagram it can be seen that the tank must be placed length ways across the beams or, in other words, parallel to the way that the floorboards run. The strongest part of a beam is always nearest to where it is supported and this meant that the tank had to be placed along one of two walls.

"It's not going by there, that's where the stereo unit goes." I patiently explained that stereo units could go anywhere by virtue of the fact that none had, to my knowledge, ever been heavy enough to fall through

a floor. After further "discussion," the steel plates were positioned along the chosen wall and the new carpet was placed over the top of them; the tank and stand were then brought in and placed to rest on top of the steel plates. The gravel was washed... and washed, and washed, have you ever tried to wash two hundred weight of gravel? Finally the rocks were brought in and my aquascape was designed and executed.

The moment could not be put off any longer and, with a small prayer, I attached the hose pipe to the tap, trailed right through the flat, hung it over the edge of the tank and turned the tap on. It takes a very long time to fill such a large tank even when the water pressure is good, which it wasn't on that day. I think I died about once a minute for the hour or so that the water was running and my stomach turned over at every creak, imagined or real, but at last, there it was, still on the same floor and full of water. The power filter was connected up to the mains and the whole lot was allowed to run overnight. Incredible to say it was still there the next morning and has, to date, remained in the same place. I still have the occasional nightmare about it going through the floor and imagine the reaction if I were to poke my head through the hole after it and ask, "Please can I have my tank back?" The family dog has taken to sleeping underneath the stand and I can only leave it to your own imaginations to picture the results of a floor collapse.

At the time of writing, my prize tank has been in position for nearly two years and has led a very chequered life indeed. After the initial worry of setting up the six footer the next crisis was to set up a four foot tank on the bottom tier of the stand. The four foot tank was home made from quarter plate glass and silicone sealant, a process that I can thoroughly



recommend to any prospective aquarium owner. The largest tank I have ever built, using this method, was a seven foot, one hundred and forty gallon job but that's another story.

The four foot tank was placed in position and the same process of filling gone through all over again and, low and behold, the whole lot didn't vanish straight through the floor, much to my relief. The dog, of course, refused to be moved and stayed underneath the stand during the filling operation, oblivious of any danger. Perhaps the dog is more aware of the intrinsic strength of wooden flooring than I am.

The first inhabitants of my six foot showpiece were, quite naturally, very large fish. Some ten inch Tinfoil Barbs, a twelve inch Orphiodes Barb, a Fossilis Catfish and a number of large gouramis of various species. These were joined, about a week later, by a big ugly oscar, all fourteen, nasty, inches of him. He had been evicted from another tank for committing the cardinal sin of devouring everything he could get into his mouth, including, so I was told, his ex-owner's thumb. The oscar seemed to settle in well for the first few days but was soon to be seen harrassing smaller inmates and generally behaving in a very ungentlemanly way. "He wants a mate," said his ex-owner, "he never behaved like that when his last mate was alive."

Eventually, a dealer sold me an oscar which he assured me was a female. The new oscar was a red tiger, ten inches in length and, pound for pound, priced somewhere in excess of caviar. When it was placed into the tank, still in its plastic bag, the other oscar scuttled up to the opposite end and proceeded to skulk behind a piece of cork bark. After a while and without a care in the world, I allowed the smaller

oscar to leave its bag, whereupon, all hell broke loose. The original oscar shot out of his hiding place and, with a burst of speed that would put a Blue Tunny to shame, rushed up and grasped the newcomer by the head. In next to no time, the smaller oscar's head was completely inside his mouth and he proceeded to shake it like a terrier will shake a rat. I still carry the scars from my attempts at separating the two fish and, needless to say, despite all I could do for it, the smaller oscar died two days later.

With much splashing and spraying of water, the large oscar was banished and the tank settled down, once again. It looked a little bare without any plant life so I decided that, as the large oscar was no longer in residence, plants would be the next item on the list. Have you ever thought what it can cost to fill a tank as large as this one with tropical, freshwater plants? Well, I can tell you . . . fourteen pounds, but it was worth every penny. "It looks just like a scene from travels up the Amazon," said my wife, "now it really is looking nice."

It stayed looking nice for just one day! My barbs must have thought it was their birthday. Boy, did they enjoy themselves. The plants lasted all of one week; the barbs lasted all of one week and one day. Ah well, back to the drawing board. . .

For a long time, I had been fancying Rift Valley cichlids and I now decided that these might well be the ideal occupants for such a tank. (See *Aquarist & Pondkeeper*, December 1975). I was told that most Malawi cichlids would not do any harm to plants and this proved to be quite true. What I did not know and was totally unaware of, was the inordinate hatred that Malawis have for the extensions on the fins of angel fish. Out came seven very tatty angel fish first thing on the morning following the introduction of my new Malawis to the six foot tank. They looked a very sorry sight indeed! As most of the angel fish were "old friends" I found a place for them in a two foot tank and trusted them to leave the inmates alone. I'll never learn, will I? Still, the angel fishes all survived their ordeal and although I no longer have them, they are all still going strong.

The tank was planted throughout with three types of Aponogetons, *A. crispus*, *A. natans* and *A. undulatus*. The plants were in bulb form but grew at a tremendous pace and the tank was soon looking a grand sight indeed. The assorted Malawi cichlids made a wonderful display, always swimming at the front of the tank and were obviously soon at home because it was not long before they began to spawn. I was more than contented with my six foot showpiece. The tank and its inhabitants were left totally undisturbed for just on a year but of course circumstances combined, yet again, to make me alter the aquatic haven. During the month of January, this year, I personally suffered no less than five electricity cuts and I must

admit that they all left me in a bit of a fix. The six foot tank was the only tropical tank I owned that was kept outside my insulated fish room. Consequently, this tank cooled down at a very rapid rate indeed; I also depend upon electricity to heat our home so the room containing the tank became cold in next to no time. Ah well, back to the drawing board again.

As the only answer I could see to the problem was to insulate the complete tank it meant that the whole kit and caboodle had to be taken down in order to remove the tank from the stand. All the tanks in my fish room contained either livebearers or killifish so where could I house my Malawis while I insulated their home? As it was a matter of priorities, the Malawis finally ended up in a retailer's tanks and I decided to break all the "rules" and use a six foot tank to house small fish. My livebearers were going to have a "dream home."

The tank was stripped down and fully insulated by the use of expanded polystyrene. Sheets of polystyrene were glued to the back and sides of the tank and the whole lot was then lowered on to a large sheet of polystyrene which was simply placed on top of the stand. During the night time I had intended to place a sheet of polystyrene right across the front of the tank but as things worked out this wasn't needed. I made some tests on a very cold day early in February and I found that with a room temperature of just over 40°F the tank only lost one degree every three hours. By my calculations (which were worked out on an arithmetic progression) this meant that I could safely leave the heating off for a total of two whole days before I needed to really start worrying about it. I was now ready to survive the worst that the electricity board could do to me and guess what, there weren't any more electricity cuts. Even so, the saving on the heating bill must be fairly considerable.

The tank was then redesigned and replanted; plants used were mainly Aponogetons again and these were placed to the back. I used dwarf valis, dwarfed by my bad husbandry, and stellata lily plants more towards the front. The stellata lily can be a bit of a menace but if all its attempts to reach the water surface are thwarted by the removal of the offending stalks, the plant will develop a tendency to bush outwards and can look most attractive. Five strands of *cabomba* were purchased and so were five strands of *ambulia*. The *cabomba* and *ambulia*, plants I've never been able to cultivate before, went absolutely mad. The growth was, and is, tremendous and I've been able to fill just about all my other tanks with cuttings from these plants.

The fish placed in the tank were all various livebearers with the exception of two clown loach (*Botia macracantha*) of very modest dimensions and a few pairs of *Apistogramma borelii*, a very peaceful, dwarf cichlid. Pairs of livebearers were added in the hope

that they would breed naturally, the only exception to this was guppies and only males of this species were used. All the fishes so far mentioned had been taken from various tanks in the fish room and this action certainly relieved a space problem that I was experiencing. A pair of *Platy variatus*, a pair of *Velifera* mollies and, on my wife's preference, a pair of Mouse Botia were all purchased specifically to enhance the newly set up tank.

All went very well for the first week and I was beginning to think that everything in the garden was rosy when guppies started to show up with ripped tails. My poor *borelii* were blamed straight away; I don't think my wife really likes them, so I wasted a whole morning skulking around with a net catching my much maligned, dwarf cichlids. Believe it or not, the fin nipping got worse not better and had soon reached epidemic proportions.

"It's those Mouse Botias," I said, "they'll have to go." This, of course, was much easier said than done! Have you ever tried to catch a crafty, cunning, extremely fast fish, only just one inch long, swimming around in seventy gallons of water (the fish not me), and provided with more inaccessible little hiding places than you've had cooked dinners? Unless you have nerves of steel and a superhuman amount of patience I'll guarantee that it'll drive you round the bend! It's rather like trying to catch houseflies by sniffing them up your nose. Suffice it to say that by the end of the day the only things left in the tank were water, gravel and fish. A curtain will be discreetly drawn over the eventual fate of our two little "friends" after they were finally removed from my very much shattered, six foot showpiece.

All stories should have a happy ending and mine will be no exception. (That had you going; bet you thought my tank had finally crashed through the floor). Today, I am very pleased to report that all is well in my aquatic monstrosity and that all bar one of the livebearing species have multiplied themselves to such an extent that I now find myself, once again, with a space problem. Growth rates are, to say the least, fantastic, especially when the fry are actually born into the tank. I have learned some very valuable lessons from my experiences and I wouldn't miss any of them if I had the time all over again (except perhaps the episode with the Mouse Botias). A six foot tank, as you will have seen, can certainly have its problems but, all in all, the pleasure it can give far outweighs them all. When you own one of these contraptions nothing is too big or too difficult to tackle and when you finally settle down to gaze at your watery creation it will give you a great feeling of accomplishment. Ah well, better go and scrape that perishing algae off the front again. I wonder... would a so and so be good enough to eat it off for me and save me the trouble? Here we go again!



# THE COURTSHIP OF FAT AGGIE

by Barry Durham

ACCORDING to all the aquarium books I have read Three Spot Gouramis are the easiest of all the bubble-nest builders to breed. But regrettably no-one seems to have told that to my fish!

My pair are at present chasing each other round and round the community tank and causing all sorts of havoc. And over the past few weeks they have caused me several sleepless nights and my wife swears that my beard has got more grey hairs in it than ever before.

I have an affinity for Three Spot Gouramis that stems from my earliest attempts at keeping tropical fish. My first out-grew the modest 18 in. x 10 in. x 10 in. aquarium that was my Christmas present when I was 13, within a few short months. And when I was married a second specimen which graced my 24 in. x 12 in. x 12 in. community tank brought my first ever certificate (a second place in the Manchester and District Open Show in 1970).

Since moving to the Preston area I have been unable to keep fish through lack of space until we moved into our new house a couple of months ago. I successfully talked my wife into letting me set up a tank again (I had jealously defended all my equipment every time there had been threats to throw it out) and had my first tank populated a couple of weeks after we moved in.

Naturally I had to have a Three Spot Gourami and our local pet shop supplied a lovely specimen. It turned out to be a female and she dominated the tank over the next few weeks by growing faster than any of the other fish and developing into, at least in my humble opinion, a possible champion.

By this time I had a second tank set up, an 18 in. x 10 in. x 10 in. one which I had been given by a friend, although it had no fish in.

My three year-old son who has become almost as interested in the fish as I have, wanted to get a Siamese Fighting Fish (no doubt he liked the brilliant colour pictures in my books), and I must admit I was tempted after breeding them in such a tank several years ago. But as my Gourami had now increased in girth as well as length, and as it had become obvious that she was ripe for spawning, I decided to try to breed my own Three Spots.

It was then that my trouble really began. No-one had a Three Spot comparable in size to "Fat Aggie" as my young son had christened her. My local pet shop had none in stock but promised to keep an eye open for one. It seemed, however, that I would have to wait until a male had outgrown someone's community tank and was brought back to the shop.

"Aggie" seemed to be getting fatter and fatter, however, (probably imagination) and I felt that the quicker I bred from her the better it would be. So I set out on a search and eventually located quite a nice sized male fish in a shop in Blackpool. He wasn't quite the same size but he seemed mature enough so I thought everything would be all right. It wasn't.

I took some of the plants out of the new tank leaving a clump of floating wistaria and, following the textbooks, introduced her into it while putting my new chap into the community tank to settle in. He was about  $\frac{1}{2}$  inch smaller than Aggie but as he began to blow great mattresses of bubbles the following day I thought at last I was going to fulfil my dream.

After feeding plenty of *tubifex* and *daphnia*, as well as dried food, everything seemed to be just right so I carefully introduced "Herbert", as he came to be known, into the tank with Aggie.

He settled down and began to build a nest right away while the female kept aloof from the proceedings. He eventually spread his bubbles in among the plants over almost a third of the surface of the tank, although they weren't very deep. He then began to display in front of the female bringing out his true colours which turned out to be a sort of purpley blue with bands of very dark purple which almost hid his spots. His anal fin became a flaming orange with the white spots standing out brilliantly. She too put on her best courting colours—a true blue with darker bands. But after a few minutes things began to go wrong. He began to get impatient and began nipping her fins. Rather to my surprise she retaliated. The two of them changed colour. The black spots disappeared and Herbert became almost uniformly purpley-grey while Aggie went pale blue-grey.

They chased around and then she cornered him and began unmercifully tearing at his fins. The nest had disappeared and poor Herbert looked very upset.

I separated them and put him back in the community tank. Over the next few days I fed them on as much live food as I could lay my hands on and once again the male began to build his nest. But Aggie for some reason started to sulk. She would stay in one corner of the tank and not move for hours on end. My wife decided she was lonely and persuaded me to put a half a dozen tetras in the same tank. It did seem to work. She came out of her hiding place and began feeding and swimming around freely once more. The tetras, too, seemed quite happy for they were too big to be eaten, and all went well for the next week or so, then I decided the time was ripe to get Herbert and Aggie together again. But that meant getting the tetras out first. That took almost an hour. The first five were easy enough to catch but one Glowlight decided he liked living with the Gourami and positively refused to be caught.

My son decided he would like to help with the result that I got a wet net swiped across my face a couple of times and in the end my wife had to take him out of the room in case he learned some new words! I eventually caught the Glowlight but obviously it hadn't been very good for the Gourami and although I let things settle down again for a few hours after replanting the tank, I got an action replay of the previous event.

Back to the community tank for Herbert and a session with all my aquarist's books for me. According to all the best authorities the male should be introduced into the female's tank, so that bit was right. They had been given the best food I could get so I decided to blame my wife for persuading me to put the tetras in the tank. Well, it couldn't possibly be my fault for being persuaded could it? In the end I decided to give them one more try according to the experts, and brought them together again after another week when Herbert had once again begun to build his islands of bubbles (they were too big to be called nests). But once again the exercise was a failure. No spawning; no nest within ten minutes of him trying to entice Aggie under it, and poor Herbert looking like Richard Dunn after his fight with Muhammad Ali.

That was when I decided to leave all my books in the bookcase and do things back to front. This time it was the female who went back into the community tank leaving poor Herbert to recuperate alone in the spawning tank. Nor was I persuaded to put any other fish in with him! I fed him as much as I could with dried food and *daphnia*, but as I couldn't get hold of any *tubifex* I played safe and left things alone for two weeks. Herbert looked good. His fins had repaired and once more his islands of bubbles began to cover the tank each morning.

So once more I brought the two of them together. Herbert had now grown a little and this time he more

than held his own. Aggie was the reluctant party once more and two or three times he got her beneath the nest in an embrace only for nothing to happen. In fact she looked rather bored with the whole performance! They didn't seem to be doing each other much harm this time, and there were plenty of plants in the tank for her to hide in so I left the tank lights off and them alone. This was about 1.00 p.m. I had to go out in the afternoon and on my return I looked in the tank to find the centre of the bubble nest full of tiny yellow eggs and Aggie hiding in a clump of floating wistaria.

I carefully lifted her out and put her back into the community tank leaving the male to look after his charges. But once again it was obvious that this fellow hadn't learned to read because he did nothing by the book. By evening the nest had begun to break up and he was showing as much interest in it as an Eskimo does in a refrigerator. As he had previously built most of his nests at night I left him with the eggs until the following morning. But by then the nest had disappeared completely and the eggs were floating freely all over the surface. In fact, he had just begun to make a breakfast of them!

I removed him pretty smartish—he wasn't going to eat them after all the trouble I had had!

I had to put him back in the community tank because he had caught me rather on the hop and I just didn't have another one ready. I was a bit worried about the babies because I thought the male was supposed to look after them until the yolk sac had been absorbed, but I felt I couldn't take any chances. In fact, they would stand more chance of hatching if he wasn't there to eat them. His paternal instincts had completely disappeared.

With the two adult fish once more together they began to create mayhem in the community tank, but to be honest, I was so fed up with their recent performances, and they weren't chasing the other fish, that I just left them to it. The battles didn't last long and although they both had split fins when I began to write this account they now seem to have settled down with only the occasional frantic few laps round the tank. The addition of a large clump of floating wistaria seemed to help, because it not only provided a hiding place for the pursued, but cut down the amount of free water they could chase round in.

The eggs hatched in under 24 hours, with no parental help, and the yolk sacs were absorbed almost as quickly with the result that the fry began to swim around in less than two days after the eggs were laid. Mild aeration was added to the tank and with the lights on for about 16 hours a day and a layer of mulm over part of the bottom, natural *infusoria* has seen the youngsters through their first few days.

Meanwhile Aggie seems to be getting fat again . . .!

# ELECTRICAL SAFETY

## THE NEW REGULATIONS

*by Dr. N. Carrington*

AFTER 30th September 1976 it will not be legal for any shop to sell or have in its possession for retail sale electrical equipment which does not comply with the Electrical Equipment (Safety) Regulations 1975. To avoid prosecution under the Health and Safety at Work etc. Act 1974 all electrical installations in shops etc. should also comply.

These regulations apply to all electrical apparatus used in the home but this article will concentrate on the implication as far as the aquarist is concerned.

To understand the regulations themselves needs a considerable amount of study but the situation can be simplified for aquariums as follows.

The equipment must now comply with the following general principles.

1. It must not be possible to reach any live electrical parts without the use of some form of tool.

2. Electrical apparatus must be either double insulated or adequately earthed or at low voltage.

There are certain temporary exemptions from these rules. The major one as far as we are concerned is that bayonet type light fittings are still acceptable in normal circumstances.

Despite the impeccable safety record of aquarium heaters and other aquarium equipment, it was inevitable that these would have to comply with the new regulations. Some changes in the law were predictable. There is a long term move to harmonise electrical regulations not only within Europe but worldwide (for instance a worldwide electrical plug is being planned). The general European regulations CEE Standard 11 have specified since 1968 that live electrical parts must not be accessible without using a tool and we were aware of this change in our regulations through various sources such as our Manufacturers Association, the Association of Manufacturers of Domestic Electrical Appliances (AMDEA) of which my company is a member. It was not until June 1975 however that the department of Prices and Consumer Protection (DPCP) notified us of the requirements that equipment should be double

insulated. Britain is in the forefront of development of double insulation standards and the requirements we are expected to meet are probably tougher than any other country in the world. The regulations were originally planned to come into effect in September 1975 and this would have given us and other manufacturers of all types of electrical equipment in all trades only four months to ensure that the equipment complied with these regulations and for retailers to run out of stocks of the equipment which did not comply. This was clearly an impossible task and a delegation of M.P.s headed by Sir George Sinclair, M.P. for Dorking, was successful in persuading the Minister Mr. Allan Williams that the delay was necessary for the whole of the electrical industry. This concession has given manufacturers of aquarium and other equipment just about enough time to carry out a proper design and development programme although a concession of a further year would have been appreciated. It has also given wholesalers and retailers time to run down stocks of electrical equipment which does not comply. However in my view the DPCP did not give adequate publicity in 1975 to the impending changes neither has it done so now.

### **How to check that equipment complies**

It is even a problem to decide if equipment complies with the new regulations. In this country we have the unsatisfactory arrangement whereby ultimately the courts of law would have to decide. However there are two simple ways in which you can determine if equipment is likely to comply.

1. The BSI scheme. Equipment may be declared by the manufacturer as conforming to the British Standard.

2. Declaration of Conformity with the Electrical Equipment Safety Regulations. The manufacturer may make a declaration that his equipment does comply and he will be liable to prosecution under the Trades Descriptions Act 1968 if he makes a false claim.

If buyers are in any doubt they should ask the

manufacturer if he has a statement from an official testing laboratory, normally the Appliance Testing Laboratory in Leatherhead, that in their opinion the equipment complies with the regulations. The manufacturer should be in a position to quote an ATL report number.

I must emphasise that the examination by ATL must be of the *whole apparatus* and not simply confined to a general statement about *one particular part*.

The following general comments on items of equipment used in the aquarium may be of interest.

1. **Electrical cable.** The cable must be double insulated and must comply with various standards. The cable used on certain Japanese pumps etc. looking like a figure eight and only having one layer of insulation is therefore no longer acceptable.

2. **Air Pumps.** The type of pump with the base not screwed on is no longer acceptable and the case must be so designed that it stands up to certain mechanical strength tests. The cable must be securely anchored.

3. **Water Pumps.** The British Standard 3456, Section 2.35 at the moment is for low voltage submersible pumps for garden ponds or swimming pools. This does not mean, however, that pumps of mains voltage which are earthed or double insulated, are necessarily unsafe. The important thing is that the manufacturer has declared that his equipment conforms with the Electrical Equipment Safety Regulations.

Non submersible aquarium pumps do not come under the low voltage requirement in the British Standard but have to comply with the general principles given at the beginning of this article. They are covered in BS 3456 Section 2.35.

There is actually a distinction between complying with the electrical safety regulations and complying with the British Standard. Ideally one should comply with the standard but in some cases (such as with aquarium heaters) the standard is at present being brought up to date and it is not at this moment always necessary to comply with all aspects of the standard in order to comply with the regulations.

4. **Aquarium Heating Equipment.** At the moment, aquarium heaters are covered by BS 3456 Section 2.8 but this Standard is intended for portable immersion heaters of other types. Talks have therefore been held to initiate a standard applicable to aquarium heaters and the four aquarium heater manufacturers in Great Britain have been duly consulted.

The general expert opinion now is that double insulated equipment is preferable to earthed equipment. The safety of an earthed unit depends upon the satisfactory connection of the earthed lead all the way back to earth so that it can be potentially dangerous if either the earth is not properly made in the wiring circuit or if the person installing the apparatus has not bothered to connect it up properly.

Manufacturers of aquarium heaters have probably had to face the most difficult tasks in finding ways of complying with the regulations. Whilst there are other problems the major one to overcome has been either to strengthen the glass tube so that its strength is adequate to stand a mechanical strength test which is applied or to replace the glass tube with something else. Essentially three methods have been used. The first method consists of bonding a plastic or silicone rubber tube to the outside of a conventional glass tube to provide another layer of insulation and to improve the mechanical properties of the tube. A second and ingenious attempt to meet the regulations has been made by utilising re-inforced installation (the equivalent of double insulation) on the thermostat body and an earthed metal tube around the heater. The third which we at Interpet favour retains the conventional glass tube on the outside of the equipment but has involved some redesign of the inside of the unit. We have incorporated two layers of insulation actually inside the glass tube. This has involved a great deal of experimental and design work utilising new technologies and high tooling charges but it does mean that we can provide the aquarist with a unit which has a thoroughly tried outer case yet is properly engineered to comply with the regulations both here and in any other country in the world.

The imposition of these new regulations has involved manufacturers of aquarium electrical equipment in an immense amount of extra work. As I see the situation however, there are long term advantages in these regulations. Firstly, we have all been obliged to review our equipment in a fresh light and we have had the incentive to design the finest possible equipment which is even safer than the previous models. Eventually the rest of the world will probably come up to the same standard as is now required in this country. U.K. manufacturers have the opportunity and incentive to be in the forefront of aquarium heater design and therefore to take out patents which should eventually be invaluable on a worldwide basis, so again helping in some small way Britain's export drive.

#### Relevant References and Legislation

1. *E.E.C. Directive 72/73 E.E.C. 19 February 1973—'The Low Voltage Directive.'*
2. *C.E.E. Standard II Part 2 Section C 1968.*
3. *Consumer Protection Act (1961).*
4. *Electrical Equipment (Safety) Regulations 1975.*
5. *Administrative Guidance on the Electrical Equipment (Safety) Regulations 1975—contains details of accepted standards.*
6. *Health and Safety at Work etc. Act (1974).*
7. *Trade Descriptions Act (1968).*
8. *C.E.N.L.E.C. Harmonisation Document 262.*
9. *B.S. 3456 Section 2.35 (Water Pumps).*
10. *B.S. 3456 Section 2.8 (Aquarium Heaters).*

# PRODUCT REVIEW

**Eheim Reverse-Flow Undergravel Filtering System**, manufactured in Western Germany by Gunther Eheim and distributed in G.B. by John Allan Aquarium Ltd., Eastern Industrial Estate, Eastern Way, Bury St. Edmunds, Suffolk. Price: Reverse-Flow Undergravel Filter—£12.58 including V.A.T., Down-Flow Undergravel Filter—£10.05 including V.A.T., Spare packet of Plates— approx. £2.50 including V.A.T.

The subject of filtration for an aquarium has always been very controversial. Many hobbyists swear by a cheap air-operated filtering system whereas others are inclined to say that the best power filter is just about good enough. I feel that this argument will never really be resolved since a filtering system, efficient in one tank, might be quite inadequate in another. Although it is generally accepted that a power filter is usually more efficient than any other kind, it is but pointless to persuade a hardened hobbyist to change his ways. That the fish in our aquaria are subjected to some very adverse environmental conditions is generally recognised; I think it is also generally recognised that their condition could be greatly improved with the aid of a suitable filtering system. But what is a suitable filtering system? A suitable filtering system for our aquaria should not only be capable of removing all the suspended dirt particles from the water but also be able to change the chemistry of the water with the aid of the various filtering media.

Most kinds of filters usually sold at tropical fish shops will certainly keep the water clean. Some are more efficient than others; some are easy to maintain whereas others need a complete re-setting up of the aquarium when the filter has become, through the accumulated dirt, ineffective or even harmful to fish and plant life.

I personally believe that a power filter is the best filtering system for almost any aquaria—a Eheim power filter used with a Eheim Reverse-Flow undergravel Filter is the best possible filtering system yet devised.

The Eheim Reverse-Flow Undergravel filter permits a weak rising of the water through the gravel bed. It facilitates the gathering of bacteria thriving on oxygen and converting all organic matter into biologically harmless substances. The formation of silt is prevented and a biological balance occurs, allowing for a healthy plant growth. The reverse-flow principle is suitable for both fresh water or sea water aquaria.

The Eheim Reverse-Flow Undergravel filters come as a complete unit with all the necessary pipes, clips and endpieces, but without the power filter, of course, which is necessary to operate this system. A unit consists of 24 bottom plates each measuring 92 mm. by 92 mm. There are sufficient bottom plates to cover a 30. by 12 in. aquarium. For larger tanks extra bottom plates can be purchased separately—in packets of six. Included is also a seven language instruction leaflet giving all spare parts reference numbers. On the whole the instructions are easy to follow even though some of the words were not too carefully chosen.

Once the exact number of bottom plates required to cover the aquarium has been established, they are laid out on a flat surface and fixed together with the springy clamps. The return pipe attachment is best placed in one of the back corners. All the outer openings of the bottom plates must be closed with the covers provided so that water cannot escape through the sides. The fitting between the connecting plate and the pipe is fitted tightly and the telescoping pipe installed. The adjusting disc is supplied for a water flow for aquaria with a bottom surface area of  $\frac{1}{2}$  square metre. One additional hole must be opened for each additional  $\frac{1}{2}$  square metre of bottom surface area.

After assembling the unit the aquarium is filled with some water (approx. 2 to 3 inches) and the unit is placed into the tank. No air must be trapped underneath the bottom plates otherwise the under-gravel filter will not function properly. A few rocks or some heavy objects will keep the bottom plates firmly in position while the gravel is added to the aquarium. A medium sized gravel (about  $\frac{1}{8}$  inch) is required and should cover the undergravel filter with a fairly even thickness of about 2 to 2½ inches. If terracing is wanted this must not be done with gravel but with additional plates which can be stacked to any height. Again, all outer openings of these plates must be covered. The telescopic pipe must be pulled out until its upper part remains about 2 inches above water level. At this average adjustment a flow of 14 litres (3 gallons) of water per hour is obtained through one hole which then rises through the gravel bed. The return pipe of the Eheim power filter is connected to the inlet pipe of the Eheim Reverse-Flow Undergravel filter and once the aquarium has been filled with water and the power filter primed the filtering system is ready to operate.

It is claimed by Messrs Eheim that this kind of

filtering system will prevent the forming of silt in the gravel bed, that the plants will grow much better and also that the whole aquarium will always be in a biological balance. These claims are not exaggerated.

I installed this filtering system for the first time about 17 months ago into a 78 in. by 24 in. by 22 in. aquarium using more than 100 bottom plates. The 125 gallon aquarium had been filtered with a Eheim 486 power filter, the same power filter is now operating the Eheim Reverse-Flow Undergravel filter. It is stated that the same sized power filter for a given size aquarium will operate the undergravel filter. The Eheim Reverse-Flow Undergravel filter was covered with a mixture of  $\frac{1}{8}$  and  $\frac{1}{4}$  in. gravel to a thickness of about 2 inches. The gravel has never been syphoned out and cleansed and it looks as clean today as it looked when it was first put into this aquarium. There are no signs of any of the black edges in the gravel one so often sees in tanks. The Amazon Sword plants in this tank have been doing extremely well even though the average temperature of the water is 86°F. (I also tried to keep Amazon Sword plants in a tank with such a high temperature but without a Eheim Reverse-Flow Undergravel filter and found that these plants were not doing well at all and very quickly died.) I can therefore only presume that I am able to grow these plants in this particular aquarium because of the Eheim Reverse-Flow Undergravel filter. This tank is mainly used to raise small Discus fish which are fed 6 to 7 times a day. In spite of this heavy feeding I have never had any problem as far as Nitrite is concerned. This Eheim Reverse-Flow Undergravel filter acts as a large biological filter which, because of the continuous supply of oxygen to the bacteria, should never clog up.

I have also installed these Eheim Reverse-Flow Undergravel filters in several smaller tanks. Some of these tanks are heavily planted with a great variety of different species of plants. All these plants seem to do much better in such a set-up. It is quite common to see 20, 30 or even 40 leaves on a single plant. In fact it is for the first time in my fish-keeping life that I have been able to grow a variety of tropical plants without any special attention.

As my main interest is, and has been for a long time, the keeping of the Discus fish, the filtration for a Discus aquarium has always presented somewhat of a problem. These fish seem to do so much better in a very clean water without dirt particles irritating the fish. To keep the water clean has always meant the use of a powerful power filter but such a filter has always produced more current in the tank than the fish could or would tolerate. The result was that they very often were huddled in one corner unwilling to make use of the tank and show themselves off. It was sometimes heartbreaking.

I found that with the use of a Eheim Reverse-Flow Undergravel filter I can use a powerful power filter on

my Discus fish tanks but the circulation of the water no longer causes the fish to be frightened by the strong current of the water. As the current of the water is markedly reduced it is advisable to install an airstone in the aquarium—especially at night—so that no fish die from lack of oxygen.

Apart from the Reverse-Flow Undergravel filter, Messrs Eheim also produce a similar system but as a Down-Flow principle. An ordinary undergravel filter is operated with an air pump whereas the Eheim Down-Flow Undergravel filter must be operated with a power filter. It requires a larger power filter as would otherwise be needed for a given sized tank. The idea is that once the dirt has been sucked underneath the gravel bed and into the space between the bottom plates and the bottom of the aquarium the power filter will have removed the dirt out of the tank. Although I personally found this system not much better than an air-operated undergravel filter, it might still appeal to some hobbyists who prefer a more silent operating undergravel filtering system for their aquaria in their living rooms.

In conclusion I would like to say that I would have preferred it if a half module of the bottom plates could also have been produced so that the whole area of any aquarium might be covered. Also a suction clip to hold the large through-flow pipe in position would have been a useful addition. Apart from these two minor points, the Eheim Reverse-Flow Undergravel filter will certainly be the answer for hobbyists who like a luxuriant plant growth and a biologically efficient aquarium to last for many years.

EBERHARD SCHULZE

#### **hW Marinemix Salts**

A top-quality salt formulation for use in making-up synthetic sea water for marine aquaria. The mix is manufactured in sterile conditions at the Hans Wiegandt laboratories in West Germany. The packaging carries the following guarantee, which I quote directly; "We guarantee that the composition of hW Marinemix is identical to that of genuine sea water; that only the purest elements are used in its production. We guarantee that all trace elements in hW Marinemix are in the exact same quantities found in natural sea water; that hW Marinemix is just as good as natural sea water, and in some cases even better, due to its purity." What more could a purchaser want? The mix contains 62 trace elements which have been "mechanically mixed". The significance of this, the makers claim, is that this production method allows later division of the packs if required without there being unequal proportions of the component chemicals in the resulting separate parts. In other words, the mixture must be homogeneous throughout the bag.

This last feature is a welcome change from those

mixes where the whole lot must be used at once. I frequently find that I get more gallons of marine water (at the correct density) from a pack than the labelling indicates, so a divisible quantity would allow some to be saved dry for partial water changing.

My 50-gallon invertebrate aquarium (see "Viewpoint," December, 1975) was set up with a solution of hW Marinemix made up to a density of 1.024 during last October, and has flourished ever since. The filter matured in about three weeks and I have yet to lose one inhabitant other than those killed or affected by others. The initial mixing was done simply by pouring the salt into the aquarium, which was half full of tap water and set up with its filter bed, rocks and corals. The turbulence from the filter lift tubes completed the mixing and provided aeration. Following the correction of the density by the addition of more tap water to suit, the first inhabitants were put in after about a week and the maturing process was begun (see "Product Review—The Interpet C.V.

Filter," February, 1976). Since then the aquarium population has been increased and now includes anemones, tube worms, urchins, a sea-star, coral polyps, prawns, a shrimp, hermit crabs and various very small creatures, including "living rock". The whole thing is so far a tremendous success. I have just (February) completed the first 25 per cent partial water change, again with hW Marinemix.

Prices (at time of writing):

2 lb. (6 gallons)	£1.20
5 lb. (15 gallons)	£2.28
10 lb. (30 gallons)	£4.00
40 lb. (120 gallons)	£14.80
80 lb. (240 gallons)	£27.60

All excluding V.A.T.

Distributed by Wingate and Golding Ltd., Barton Stacey, Winchester, Hampshire SO21 3QL. Telephone: Sutton Scotney 792 and 793.

A. JENNO.

## PRESS RELEASE



### New Interpet safety heaters will increase exports

INTERPET has started production of the first aquarium heater units designed to meet the new electrical safety standards. These designs combine the latest technology with the reliability features of the previous units.

The thermostat is protected by a polycarbonate sleeve whilst the heater is covered with an aluminium tube inside of which is a double insulated element. The whole unit is encased in a glass tube to ensure freedom from corrosion and contamination of the aquarium or the home brewing operation.

These new designs are the result of intensive work and co-operation between Mr. John Craven and Dr. Neville Carrington. This team is highly qualified

to produce a heater of such an advanced design.

John Craven is Interpet's technical director responsible for electrical development and has great experience in this field. During the war he was involved in the production of radios for Lancaster bombers and ever since this has designed and produced aquarium heaters and airpumps.

Neville Carrington is Managing Director of Interpet and is a pharmacist with a Ph.D. in engineering. After working in research and production capacities for a multi national company, he entered the aquatic business full-time 13 years ago.

Dr. Carrington says "There were several ways in which we could have met the new regulations. We rejected the idea of using a plastic coating on the outside of the glass tube since there is no long-term experience of its strength—also our experiments showed that it was liable to soak up dyes and other chemicals and contaminants from the water. Similarly we decided that the unit had to be totally double insulated rather than earthed, since the idea of earthing equipment has now gone into some disfavour because the safety depends upon a good earth connection throughout the whole circuit.

"Although the design problems were much greater we have progressed the method which outstandingly appealed to us. It now appears that our method may be particularly acceptable in various other countries although at the time we did not think there would be an export potential for our new units."

Picture shows John Craven (left) and Neville Carrington (right) with some experimental apparatus discussing design details of the new equipment.



## from AQUARISTS' SOCIETIES

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

OPEN Show results of the **Leamington and District A.S.** were as follows: Male Beta Splendens: 1, G. Brockhouse (Dudley); 2, 3 and 4, T. and J. Mayle (Castle Bromwich Select, A.O.V. Anabantids); 1, B. Brown (Leamington and District); 2, Mr. and Mrs. Chamberlain (Leamington and District); 3, I. Fuller (Rugeley); 4, P. Mills (North Warwick). Characins (Small): 1, T. A. Cruickshank (Ealing); 2 and 3, T. and J. Mayle (Castle Bromwich Select); 4, C. Mitchelson (Goodyears End), A.O.V. Characins; 1, C. J. Sykes (Catfish Association); 2 and 4, A. Bailey (North Warwick); 3, K. Payne (North Warwick); A.V. Male Guppy: 1, Miss A. Cox (Nuneaton); 2 and 3, S.M.L.N. (Nuneaton); 4, T. and J. Mayle (Castle Bromwich Select); A.V. Molly: 1, T. A. Cruickshank (Ealing); 2, R. G. Roberts (J. C. Bamford); 3, B. Brown (Leamington and District); 4, Mr. and Mrs. Chamberlain (Leamington and District); A.O.V. Livebearer: 1, K. Payne (North Warwick); 2, Mrs. D. Cruickshank (Ealing); 3, A. Onslow (Loughborough and District); 4, Master P. G. Stoodley (Leamington and District). Danio, Brachy Danio and W.C.M.M.: 1, Miss A. Cox (Nuneaton); 2, T. A. Cruickshank (Ealing); 3, K. Payne (North Warwick); 4, A. Onslow (Loughborough and District). Barbs (Small): 1 and 2, C. J. Sykes (Catfish Association); 3 and 4, Mrs. D. Cruickshank (Ealing). A.O.V. Barbs: 1, Mr. and Mrs. Wans (Rhondda); 2, K. Payne (North Warwick); 3, Mr. and Mrs. Nesbit (Goodyears End); 4, T. and J. Mayle (Castle Bromwich Select); A.V. Rasbora: 1, Mr. and Mrs. Nesbit (Goodyears End); 2, C. J. Sykes (Catfish Association); 3 and 4, Mr. and Mrs. C. Chamberlain (Leamington and District); Cichlids (Small): 1, T. Redfern (Hinckley); 2, K. Payne (North Warwick); 3, Master K. Page (Leamington and District); 4, T. and J. Mayle (Castle Bromwich Select); A.O.V. Cichlids: 1, B. Chittenden (Leamington and District); 2, B. Bailey (North Warwick); 3, Mr. and Mrs. Cox (Nuneaton); 4, E. Sandercock (Goodyears End); A.V. Egg-laying Toothcarp: 1 and 3, F. Hurst (Coventry Pool and Aquarium Soc.); 2, Mr. and Mrs. Cox (Nuneaton); 4, S.M.L.N. (Nuneaton). Corydoras and Brochis Catfish: 1, B. Bailey (North Warwick); 2, Mrs. D. Cruickshank (Ealing); 3, M. Burridge (Leamington and District); 4, S.M.L.N. (Nuneaton). A.O.V. Catfish: 1, R. White (Rugeley); 2, T. and J. Mayle (Castle Bromwich Select); 3, C. Darbey (Wombourne); 4, B. Brown (Leamington and District); A.V. Loach: 1, K. Payne (North Warwick); 2, R. Cleaver (Coventry Pool); 3, Mr. and Mrs. Cox (Nuneaton); 4, S.M.L.N. (Nuneaton). Pairs, Livebearers (True): 1, G. Brockhouse (Dudley); 2, S.M.L.N. (Nuneaton); 3, Mrs. D. Cruickshank (Ealing); 4, T. and J. Mayle (Castle Bromwich Select); Pairs Egg-layers (True): 1, C. Mitchelson (Goodyears End); 2, S.M.L.N. (Nuneaton);

3, Mr. and Mrs. Cox (Nuneaton); 4, K. Payne (North Warwick). Breeders (Livebearers): 1, T. Redfern (Hinckley); 2, T. and J. Mayle (Castle Bromwich Select); 3 and 4, S.M.L.N. (Nuneaton). Breeders (Egg-layers): 1 and 2, F. Hurst (Coventry Pool); 3, T. and J. Mayle (Castle Bromwich Select); 3 and 4, S.M.L.N. A.O.V. Tropical: 1, Mr. and Mrs. Chamberlain (Leamington and District); 2, 3 and 4, A. Onslow (Loughborough and District); A.V. Single Tail Goldfish: 1 and 4, Master P. G. Stoodley (Leamington and District); 2, A. Bailey (North Warwick); 3, B. Chittenden (Leamington and District); A.V. Twin Tail Goldfish: 1, 2 and 3, Master P. G. Stoodley (Leamington and District); A.V. Pond or River Fish: 1 and 3, Mr. and Mrs. Chamberlain (Leamington and District); 2, S.M.L.N. (Nuneaton); 4, R. Cleaver (Coventry Pool).

The management committee of the **British Killifish Association** held a meeting recently when it was decided that there would be no increase in subscriptions for the fiscal year September 1976 to August 1977, the enrolment fee for members in the U.K. being £4 per annum. The meeting was held at Treberfydd Hall in South Wales the venue of a recent talk by Mr. Alf Radda of Vienna.

Thanks to the efforts of Mr. John Parker the B.K.A. Species Controller Members have been afforded the opportunity of obtaining many new species of killifish over the past year and it is hoped that more new species will be available during 1977. Information concerning the Association can be obtained from the B.K.A. Secretary W. Devison, 'Australis' 2 Shaw Road, Tipton, West Midlands DY4 7QA and letters requiring an answer must be accompanied by a S.A.E.

**MEMBERS** at the July meeting of the **King's Lynn A.S.** were given a talk on fish diseases by local veterinary surgeon Mr. R. Haveron M.R.C.V.S. This was very interesting and Mr. Haveron also answered questions put by members. Meetings are held at 8 p.m., the second Thursday each month at The Victoria, Loke Road, King's Lynn and new members or visitors are always welcome. Club Secretary is Mr. D. Mackay. Tel. Downham Market 3610.

**THERE** were 394 entries for the first open show of the **South East London A.S.** The results were as follows: Class A: 1, Mrs. V. A. Feast (Tonbridge); Class B: 1, B. Sayers (Brighton); 2, A. E. Greenhalf (Bexleyheath); 3, T. Woolley (Saracens); 4, Cresswell (E. Dulwich); Class Ba: 1, Mrs. M. Wells (S.E.L.A.S.); 2, T. Woolley (Saracens); Class C: 1, Mr. and Mrs. P. Edwards (Thanet); 2, J. H. Jackson (Basingstoke); 3, T. Ramshaw (Brighton); 4, C. and D. Finnis (Strood and Dist.); Class Ca: 1, May Netherell (Riverside); 2, R. Nurse; 3, A. J. Feast (Tonbridge); 4, Mr. and Mrs. B. Edwards (Thanet); Class D: 1, May Netherell (Riverside); 2, K. Connelly (Gosport); 3, J. W. F. Hughes (Roehampton); 4, Mr. and Mrs. R. Houghton (Brighton); Class Da: 1, K. Connelly (Gosport); 2, J. H. Jackson (Basingstoke); 3, A. C. Best (Strood & Dist.); 4, C. and D. Finnis (Strood & Dist.); Class E: 1, T. Hewitt (S.E.L.A.S.); 2, C. and D. Finnis (Strood & Dist.); 3, H. W. Hughes (Roehampton); 4, T. Ramshaw (Brighton); Class Ea: 1 and 4 T.

Woolley (Saracens); 2, Mrs. M. Shirley (Godalming); 3, D. Winder (E. Dulwich); Class F: 1, B. Scales (B.K.A.); 2, T. Woolley (Saracens); 3, A. T. Higgins (S.E.L.A.S.); 4, Miss K. Sayers (Brighton); Class G: 1, Ian Rogers (C.A.G.B.); 2, T. Woolley (Saracens); 3, May Netherell (Riverside); 4, W. F. Sutton (C.A.G.B.); Class H: 1 and 3, May Netherell (Riverside); 2 and 4, P. W. Cottle (N. Kent); Class J: 1 and 2, T. Ramshaw (Brighton); 3, D. Winder (E. Dulwich); 4, A. J. Feast (Tonbridge); Class K: G. Hill (C. & D. A.S.); 2, A. J. Feast (Tonbridge); 3, M. Wright (Basingstoke); 4, Mrs. V. A. Feast (Tonbridge); Class M: 1, V. Connelly (Gosport); 2, Mr. and Mrs. M. Rooney (Brighton); 3, T. Ramshaw (Brighton); 4, J. Walker (S.E.L.A.S.); Class N: 1, Mr. and Mrs. M. Rooney (Brighton); 2, Master D. Winder (E. Dulwich); 3, Mr. and Mrs. R. Houghton (Brighton); 4, A. E. Noronha (Orpington); Class N.o.t.: 1, 2, and 3, A. E. Noronha (Orpington); 4, D. M. Cheswright (Southend L. & Dist.); Class O: 1 and 3, A. D. Sharp (C. & D. A.S.); 2, D. W. Crowne; 4, A. E. Noronha (Orpington); Class P: 1 and 3, A. D. Sharp (C. & D. A.S.); 2 and 4, A. E. Noronha (Orpington); Class Q: 1, 2, 3 and 4, C. and D. Finnis (Strood & Dist.); 3, A. E. Noronha (Orpington); Class S: 1 and 2, D. W. Crowne; 3, J. L. Martin; 4, Mr. and Mrs. Wright (Thanet); Class T: 1 and 2, D. M. Cheswright (Southend L. & Dist.); 3 and 4, A. E. Noronha (Orpington); Class U: Miss L. Feat (Tonbridge); 2, Mr. and Mrs. Pannell (Hastings); 3 and 4, P. Theobald (Irlith); Class V: T. Asquith (S.E.L.A.S.); 2, Misses D. and S. Jackson (Basingstoke); 3 and 4, P. Theobald (Irlith); Class Xb-m: 1, Mr. Shiner (B.K.A.); 2, D. M. Cheswright (Southend L. & Dist.); 3, W. F. Sutton (C.A.G.B.); 4, K. Connelly (Gosport); Class Xc-t: 1, 2 and 4, A. E. Noronha (Orpington); 3, P. W. Cottle (N. Kent); Class Z: 1, K. Connelly (Gosport); 2, Master G. Cottle (N. Kent); 3, C. Cheswright (Southend L. & Dist.); 4, Mrs. M. Shirley (Godalming). Best in Show—Pan Rogers—Microglossis parahybala Highest Pointed Club—Orpington.

**TABLE** show awards at the June meeting of the **Bristol A.S.** resulted as follows:—Bristol Shubunkins: 1, 2 and 3, V. Cole; 4, G. Bell. Moors: 1, J. Day; 2 and 3, H. C. B. Thomas. Veils: 1 and 2, G. Bell. Barbs: 1, Miss H. Morgan. Loaches: 1, Mr. Price; 2, Miss H. Morgan. Catfish: 1, Miss H. Morgan.

The meeting also discussed the forthcoming Open Coldwater Show on 18th September, which is also the venue for the Nationwide Trophy for Bristol Shubunkins over 3 in., body length. Members who had visited Kew Gardens enjoyed the outing.

In July the Society heard a talk by Mr. L. Littleton, from the Severnside panel of speakers. His subject was Livebearers. The finer showing points of Mollies, Swordtails and Platies were explained and illustrated by large line drawings. The numerous questions proved that the Speaker had presented many points of interest to his listeners. There was a sale of young Koi and pond and aquarium plants kindly donated by Mr. V. Cole.

**SPEAKERS** recently at the **Portsmouth A.S.** general meetings have been Mr. K. Taylor of the Havant and District A.S. who gave an excellent slide lecture on cichlids with a few other species of fish and amphibians, lizards, etc., thrown in for good measure some of which were owned by club members, and Mr. V. Hunt, one of the resident members, who gave an illustrated talk on flies and their association with fish and man.

Recent table show results are as follows:—Barbs: 1, B. Binstead; 2, 3 and 4, A. Atkinson. Rasboras: 1, 3 and 4, Miss J. Salt; 2, E. Binstead. Rooted plants: 1, Miss W. Ryder; 2, W. Ryder; Floating plants: 1, E. Binstead.

**THERE** were 697 entries at the **Southend, Leigh and District A.S.** open show in May. Results were as follows: Class Aa-b: 1, Bethel Green A.S.; 2, Riverside A.S.; 3, S.E.A.D.A.S.; 4, East London; Class Ag: 1, R. J. Hard (Hantsacre); 2, M. Goss (Riverside); 3, W. R.

**IN AQUARIUM OR POND  
BE SAFE  
WITH**   
**Hillside Aquatics London N12**



Dale (B.G.A.S.); 4, J. Leahy (S.L.A.D.A.S.). Class AK: 1, D. C. North (Corringham); 2, S. Hodges (B.G.A.S.); 3, M. Goss (Riverside); 4, S. Imptage (Walthamstow). Class B: 1, D. C. M. Durrant (S.L.A.D.A.S.); 2 and 4, P. Moye (Sudbury); 3, V. Green (Ipswich); Class Bz: 1, A. Chandler (Walthamstow); 2, T. Woolley (Saracens); 3 and 4, D. Nice (S.L.A.D.A.S.). Class C: 1, J. Brown (Croydon); 2, P. Moye (Sudbury); 3, G. and B. Finnis (Strood); 4, G. Wickman (S.L.A.D.A.S.). Class Ca: 1 and 2, R. Thoday (Baintree); 3, J. Randall (Hazelmerre); 4, B. D. Line (East London). Class Cb: 1, Mrs. E. Greenhalf (Beckley Heath); 2, T. Frazer (Basingstoke); 3, P. Moye (Sudbury); 4, T. Woolley (Saracens). Class D: 1, May Nethersell (Riverside); 2, R. A. Jones (Rom. and Bec.); 3, P. and L. Hills (Aylesbury); 4, K. Collins (S.L.A.D.A.S.). Class Da: 1, C. and B. Finnis (Strood); 2, A. C. Best (Strood); 3, R. J. Wylie (S.L.A.D.A.S.); 4, K. Bertie (Walthamstow). Class Db: 1, Mrs. A. Greenhalf (Beckley Heath); 2, L. Wooler (Hazelmerre); 3, J. Leahy (S.L.A.D.A.S.); 4, D. Wallington. Class De: 1, A. E. Noronha (Orpington); 2, R. A. Jones (Rom. and Bec.); 3, D. C. North (Corringham); 4, E. Wain (Aylesbury). Class E: 1, J. Brown (Croydon); 2, A. Chandler (Walthamstow); 3, D. Finch (S.L.A.D.A.S.); 4, W. R. Dale (B.G.A.S.). Class Ea: 1, R. J. Wylie (S.L.A.D.A.S.); 2, T. Woolley (Saracens); 3, C. W. Goddard (Sudbury); 4, R. J. Hard (Hazelmerre). Class Eb: 1, R. J. Wylie (S.L.A.D.A.S.); 2, R. Rowland (Baintree); 3, R. Thoday (Baintree); 4, B. Meech (Baintree). Class F: 1, V. Green (Ipswich); 2, R. and I. Shiner (B.K.A.); 3, K. Martin (Thurrock); 4, R. C. Smith (Rom. and Bec.). Class G: 1, May Nethersell (Riverside); 2, T. Woolley (Saracens); 3, K. Adams (S.L.A.D.A.S.); 4, Mrs. D. Raggatt. Class H: 1, P. Moye (Sudbury); 2, May Nethersell (Riverside); 3, W. R. Dale (B.G.A.S.); 4, Mrs. A. Greenhalf (Beckley Heath). Class I: 1, D. and M. Durrant (S.L.A.D.A.S.); 2, D. Edwards (S.L.A.D.A.S.); 3, G. Sandford (Reigate); 4, Mr. and Mrs. Fry (Beckley Heath). Class K: 1 and 2, P. Moye (Sudbury); 3, R. J. Wylie (S.L.A.D.A.S.); 4, Mr. and Mrs. Fry (Beckley Heath). Class L: 1, B. Nichols (Mid Kent); 2, T. Frazer (Basingstoke); 3, P. Moye (Sudbury); 4, G. Sandford (Reigate). Class M: 1, Mr. and Mrs. Cooper (Corringham); 2, R. Thoday (Baintree); 3, K. Adams (S.L.A.D.A.S.); 4, G. Biggs (Riverside). Class NB-M: 1, T. A. Cruickshank (Ealing); 2, K. Dryden (Croydon); 3, R. F. Thoday (Baintree); 4, R. J. Wylie (S.L.A.D.A.S.). Class NO-T: 1, D. Chewright (S.L.A.D.A.S.); 2, G. Smith (Walthamstow); 3, D. Cruickshank (Ealing); 4, A. E. Noronha (Orpington). Class O: 1 and 2, A. C. Martin (S.L.A.D.A.S.); 3, J. Randall (Mid Herts); 4, B. Reynolds (Rom. and Bec.). Class P: 1, A. E. Noronha (Orpington); 2, J. Randall (Midhurst); 3, D. C. North (Corringham); 4, B. Reynolds (Rom. and Bec.). Class Q: 1, 2, 3 and 4, A. E. Noronha (Orpington). Class R: 1, P. Moye (Sudbury); 2, B. Reynolds (Rom. and Bec.); 3, C. and B. Finnis (Strood); 4, R. A. Jones (Rom. and Bec.). Class S: 1, D. W. Crowe; 2, S. Spicer (S.L.A.D.A.S.); 3, D. E. Little (S.L.A.D.A.S.); 4, P. Moye (Sudbury). Class T: 1 and 2, K. Dryden (Croydon); 3 and 4, A. E. Noronha (Orpington). Class U: 1, 2, 3 and 4, Mrs. S. Hodges (B.G.A.S.). Class V: 1, 2, 3 and 4, A. Bullock (B.G.A.S.). Class W: 1, Mrs. S. Hodges (B.G.A.S.); 2, J. Randall (Midhurst); 3 and 4, Mr. and Mrs. Fry (Beckley Heath). Class WA: 1 and 2, K. Adams (S.L.A.D.A.S.); 3, Mrs. F. Perry (B.K.K.S.); 4, G. Wickman (S.L.A.D.A.S.). Class XB-M: 1 and 4, R. and I. Shiner (B.K.A.); 2 and 3, M. Strange (Basingstoke). Class XO-S: 1 and 4, A. E. Noronha (Orpington); 2, B. Reynolds (Rom. and Bec.); 3, Mr. and Mrs. B. Fry (Beckley Heath). Class XO-T: 1, 2 and 3, A. E. Noronha (Orpington); 4, M. Strange (Basingstoke). Class Y: 1 and 3, D. Chewright (S.L.A.D.A.S.); 2, J. Leahy (S.L.A.D.A.S.). Class Z: 1, D. C. M. Durrant (S.L.A.D.A.S.); 2, P. Capon (S.L.A.D.A.S.); 3, G. Smith (Walthamstow); 4, S. Hodges (Walthamstow). Class Za: 1, S. Emptage (Walthamstow); 2, W. F. Woodward (Beckley Heath); 3, D. Chewright (S.L.A.D.A.S.); 4, P. Capon (S.L.A.

D.A.S.). Class B-My: 1 and 4, P. Barrett (H.L.A.P.A.); 2, M. O'Reilly (Symonds A.S.); 3, R. Woolley. Class O-Ty: 1 and 2, G. Crosby (Ilford); 3, R. Woolley; 4, S. Cooper (Corringham). Class U-Wy: 1, G. Crosby (Ilford); 2, R. Woolley; 3, D. Wylie (S.L.A.D.A.S.); 4, P. Breen (Beckley Heath).

MEMBERS of the Mid-Sussex A.S. heard Dr. N. Carrington at the July meeting give a very interesting talk and slide show on his recent visit to the Far East. The main topic was the local fish farms of Singapore and Hong Kong, but the climate, and the way of life in these areas were also included in the talk. Mr. C. Corbin and Mr. D. Soper judged the table show classes as follows: Coldwater: 1 and 2, M. Sparshott; 3, S. Frost. Livebearers: 1 and 3, E. and T. Tester; 2, S. Frost. Loaches: 1 and 3, E. and T. Tester; 2, S. Frost. Sparshott. Further details regarding the Society may be obtained from the Secretary, B. Slade, "Sundown", Bolney Road, Arnsay (H. Heath 5747).

IN July, Cardiff A.S. held their Open Show which was well supported by the local Welsh Clubs as well as several English Clubs. There were 394 entries and the Best Fish in Show Award was won by Mr. and Mrs. Purdy (Merthyr A.S.). Most Points in Show prize was won by C. Turner (Cardiff A.S.). The Best Coldwater Trophy went to Miss C. Rupert of Port Talbot A.S. Class results were as follows:—B: 1, C. Turner (Cardiff); 2, C. and J. Richards; 3, J. Edwards; 4, R. Dore. C: 1, G. Best (Llantwit Major); 2 and 4, C. Turner; 3, D. Parry. Ca: 1 and 4, C. Turner (Cardiff); 2, J. Edwards; 3, G. Best. D: 1, Mr. and Mrs. Dore (Newport); 2, G. Legge; 3, M. Parsons; 4, E. Morgan. Da: 1, Mr. and Mrs. T. Edwards (Port Talbot); 2, P. and Y. Watts; 3, Mr. and Mrs. Cotton; 4, E. Hurley. Db: 1 and 2, J. Egan (Port Talbot); 3, C. Turner; 4, P. and Y. Watts. E: 1, M. Jenkins (Cheltenham); 2 and 3, C. Turner; 4, S. Bartlett. Ea: 1, C. and J. Richards (Sudbury); 2, C. Goddard; 3, J. Egan; 4, Mr. and Mrs. Davies. F: 1, C. and J. Richards (Sudbury); 2, C. M. Morgan; 3, M. Addicot; 4, J. Dunn. G: 1, J. Edwards (Llantwit Major); 2 and 4, C. Turner; 3, E. Morgan. H: 1 and 3, W. G. Best (Llantwit Major); 2, B. Guay; 4, C. Turner. Hy-Ty (Juniors): 1 and 2, M. Burton (Merthyr A.S.); 3, A. Parker; 4, I. Jones. J: 1, G. Best (Llantwit Major); 2, M. Parsons; 3 and 4, C. Turner. K: 1, J. Edwards (Llantwit Major); 2, C. Turner; 3, C. and J. Richards; 4, G. Best. L: 1 and 3, C. and J. Richards (Sudbury); 2, C. Goddard; 4, R. Batten (F.B.A.S. Championship Class). La: 1 and 3, C. Turner (Cardiff); 2, D. Parry; 4, J. Legge. M: 1, L. Brazier (Sudbury); 2, D. Parry; 3 and 4, C. Turner. N: 1, C. Turner (Cardiff); 2, M. Davies; 3, P. Willis; 4, L. Brazier. O: 1, J. Dibble (Naibles); 2, E. Hurley; 3, Mr. and Mrs. Dore; 4, C. and J. Richards. P: 1, D. Parry (Gloucester); 2, E. Hurley; 3 and 4, J. Egan. Q: 1, B. Bow Fouracre. R: 1, M. Bishop (Cheltenham); 2, M. Thomas; 3, R. Batten; 4, C. Turner. S: 1 and 2, B. Ashcroft (Rhonda); 3, Fouracre; 4, C. Morrison. T: 1, R. Purdy (Merthyr); 2, D. Parry; 3 and 4, C. Morrison. XB-M: 1, Mr. and Mrs. Dore (Newport); 2, G. Best; 3, M. Jenkins; 4, R. Ryan. XO-T: 1, C. Turner (Cardiff); 2, R. Purdy; 3 and 4, M. Davies. U: 1, 2, 3 and 4, Miss C. Rupert (Port Talbot). V: 1, 2, 3 and 4, Miss C. Rupert (Port Talbot). W: 1, 2, 3 and 4, Miss C. Rupert (Port Talbot).

AN informative talk on Barbs was given to members of the Southern Independent A.S. by Mr. J. Bellingham of the Tonbridge A.S. The results of the table show are as follows:—Class G: A.O.S. Catfish: 1 and 4, B. Saxby; 2 and 3, Mrs. A. Adams. Class D: Cichlids: 1 and 2, Mrs. A. Adams; 3, B. Saxby; 4, Mrs. S. Henderson. Class B: Labyrinth: 1, Mrs. A. Adams; 2, Miss P. Browne; 3, S. Harris.

THE Basingstoke A.S. all Cichlid Show was the success hoped for with 231 entered covering a wide range of the species that are available to aquarists. During judging Dr. Rosemary Lowe-McConnell gave a lecture on the cichlids

from Guyana. Before this both she and Dr. Ethylwynne Trewwas had spent some time identifying some of the fish exhibited.

The Class winners were: Pterophyllum (Angels) also wins the F.B.A.S. Championship Trophy: 1, A. Weaire (Southampton A.S.); 2, J. Jackson (Basingstoke A.S.); 3, P. Brown (Soton). Apistogramma: 1, M. Strange (Basingstoke A.S.); 2 and 3, A. Weaire (Southampton A.S.). Nannacara and Crenicara: 1, H. J. Franklin (Trowbridge A.S.); 2, W. West (Salisbury A.S.); 3, R. Hart (Hounslow A.S.). Symphysodon: Discus: 1, K. Connolly (Gosport A.S.). Geophagus: 1, F. May (Basingstoke A.S.); 2, P. George (Basingstoke A.S.); 3, A. Weaire (Southampton A.S.). Aequidens: 1, C. Thorpe (Reigate and Redhill A.S.); 2, R. Adams (Salisbury A.S.); 3, P. Brown (Southampton A.S.). Cichlasoma: 1, M. Strange (Basingstoke A.S.); 2, B. Sayers (Brighton and Southern A.S.); 3, R. Caning (Newbury A.S.). Crenicichla (Pikes): 1, May Nethersell (Riverside A.S.); 2, R. Adams (Salisbury A.S.); 3, D. Ellis (Aylesbury A.S.). American Cichlids (Any Other Species): 1, W. Knight (Gosport A.S.); 2, J. May (Basingstoke A.S.); 3, T. Fraser (Basingstoke A.S.). Tilapia: 1, May Nethersell (Riverside A.S.); 2, F. Cripps (Newbury A.S.); 3, N. Gilbert (Canterbury A.S.). Haplochromis: 1, S. Pitcher (Salisbury); 2, K. Connolly (Gosport A.S.); 3, C. Thorpe (Gosport A.S.). Pseudotropheus: 1, W. Knight (Gosport A.S.); 2, K. Connolly (Gosport A.S.); 3, D. Edleston (Salisbury A.S.). Labotropheus: 1, W. Knight (Gosport A.S.); 2, Mr. and Mrs. G. Stacey (Petersfield A.S.); 3, F. Cripps (Newbury A.S.). Aulonocara and Trematocranus: 1, W. Knight (Gosport A.S.); 2, M. Pirie (Gosport A.S.); 3, A. Rigby (Gosport A.S.). Idotropheus, Melanochromis and any other Mbuna: 1, Mr. and Mrs. R. Houghton (Brighton and Southern A.S.); 2, W. Knight (Gosport A.S.); 3, K. Connolly (Gosport A.S.). Julidochromis, Lamprologus and Tropheus: 1 and 3, G. Enright (South Shields A.S.); 2, K. Connolly (Gosport A.S.). Pelvicochromis: 1, Mr. and Mrs. G. Stacey (Petersfield A.S.); 2, E. and T. Tester (Mid-Sussex A.S.); 3, S. May. Chromidotilapia: 1, Mrs. J. Edleston; 2, T. Fraser (Basingstoke A.S.). African Cichlids and other Species: 1, J. Jackson (Basingstoke A.S.); 2, C. Enright (S. Shields). Etroplus: 1, W. Knight (Gosport A.S.); 2, J. Menhennet (New Forest A.S.); 3, W. Knight (Gosport A.S.). Pates: 1 and 2, Mr. and Mrs. Houghton (Brighton and Southern A.S.); 3, K. Connolly (Gosport A.S.). X.D.s-1 'American' Breeders Teams: 1, K. Connolly (Gosport A.S.); 2, R. Rummy (Mid-Herts A.S.). X.D.s-2 (Any Other Breeders Teams): 1, K. Connolly (Gosport A.S.); 2, A. Robert (Brighton and Southern A.S.); 3, Mr. and Mrs. R. Houghton (Brighton and Southern A.S.). Trophy for the Best 'Big-un' was won by S. Pitcher (Salisbury A.S.). H.P. Competitor: K. Connolly, H.P. Society Gosport A.S. Best Fish in the Show was a Petrotillapia tridentiger owned by Mr. and Mrs. Houghton.

MAIN item at the New Forest A.S. July meeting was colour slide lecture on "Plants for the Aquarium," from Brighton A.S. This contained many of the more unusual species in both tropical and coldwater fishkeeping.

Table Show results: W.C.M. Minnow: 1 and 2, B. Higginson; 3 and 4, P. Wheeler. A.O.S. Tropical: 1, M. Aust; 2, B. Higginson. A.O.S. Coldwater: R. Travers. Mollies: P. Norup.

THERE was a total of 482 entries for the South Shields A.S. Results: Class A.D.: 1, E. Snaith (Northumbria); 2, A. Howgate (Stanley); 3, N. Thompson (Wallsend). Barbs: 1, R.

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Neworthy (Northumbria); 2, J. Page (Half Moon); 3, M. Carr (South Shields). Class B: 1 and 3, B. Risbridge (South Shields); 2, E. N. Hodgson (Penrith). Hypheas, Hemi and Change: 1, A. Costin (Priory); 2, N. Strange (Basingstoke); 3, R. Neworthy (Northumbria). Nannostomus: 1, T. Fraser (Basingstoke); 2, A. Howgate (Stanley); 3, B. Risbridge (South Shields). Class C: 1, F. Myers (Independent); 2, K. Alder (Hartlepool); 3, L. Henderson (South Shields). Angels: 1, Mrs. J. Surtees (Stanley); 2, P. S. Kerr (South Shields). Aplit., Nann. and Pelmat: 1, E. Hodgson (Priory); 2, I. Donnelly (Independent); 3, T. Wilson (Mount Pleasant). Haplochromis, etc.: 1, D. Wright (Independent); 2, R. Atherton (Hartlepool); 3, M. Noble (Redcar). Class D: 1, M. Moreland (Half Moon); 2, R. Atherton (Hartlepool); 3, L. Henderson (South Shields). Fishers: 1, B. Foster (Bimby); 2, B. Shacklock (Half Moon); 3, A. Howgate (Stanley). Labyrinth: 1, N. Sneedon (Hartlepool); 2, P. Redman (Hartlepool); 3, C. Mitchell (South Shields). Aphysocentrus: 1, A. Howgate (Stanley); 2, J. Middlemass (Stanley); 3, L. Ruffell (South Shields). Egglayers: Toothcarps: 1 and 3, J. W. Pells (Priory); 2, E. Prytherch (Ashington). Tropical Catfish: 1, R. Burns (Independent); 2, Mr. and Mrs. Kidd (Killingworth); 3, V. Mooney (Stockton). Corydoras and Brochis: 1, E. N. Hodgson (Penrith); 2, G. Brown (Northumbria); 3, L. Ruffell (South Shields). Rasboras: 1, R. Neworthy (Northumbria); 2, A. Bloomfield (Mount Pleasant); 3, D. Smith (Killingworth). Danio and W.C.M.M.: 1, A. Stevens (Middlesbrough); 2, E. Rubson (N.T.F.S.); 3, P. Napier (South Shields). Loach: 1, D. Turnbull (Mount Pleasant); 2, Mr. and Mrs. McKenzie (Priory); 2, E. N. Hodgson (Penrith). Labo: 1, G. Brown (Northumbria); 2, Mr. and Mrs. Wright (South Shields); 3, J. Page (Half Moon). Egglayers A.O.S.: 1, M. Carr (South Shields); 2, B. Risbridge (South Shields); 3, T. Powley (Penrith). Egglayers (Pairs): 1, R. Neworthy (Northumbria); 2, B. Rubson (N.T.F.S.); 3, T. Wilson (Mount Pleasant). Livebearers (Pairs): 1, D. Smith (Killingworth); 2, A. Howgate (Stanley); 3, T. Dixon-Cave (South Shields). Class OA to OH: 1 and 3, A. Harrison (Billingham); 2, T. Dixon-Cave (South Shields). Class OJ to OR: 1, P. S. Kerr (South Shields); 2, T. Hope (Hartlepool); 3, M. Noble (Redcar). Guppy (Female): 1, D. Smith (Killingworth); 2, Mr. and Mrs. Knobbs (Stockton); 3, R. Neworthy (Northumbria). Swordtails: 1, T. Dixon-Cave (South Shields); 2 and 3, Mr. and Mrs. Laydon (South Shields). Platies: 1, King Family (South Shields); 2, R. Kirkup (Mount Pleasant); 3, B. Foster (Bimby). Mollies: 1 and 2, W. Mooney (Stockton); 3, M. Stevens (Hartlepool). Livebearers (A.O.S.): 1, M. Strange (Basingstoke); 2 and 3, T. Marshall (N.T.F.S.). Singetail Goldfish: 1, E. Hodgson (Priory); 2, M. Long (Cleveland); 3, B. Risbridge (South Shields). Twintail Goldfish: 1 and 2, H. Farlong (Independent). A.O.S. Coldwater: 1, R. Atherton (Hartlepool); 2, F. Askew (South Shields); 3, Kane Family (Billingham). Class XOP: 1, T. Dixon-Cave (South Shields); 2 and 3, P. Wright (South Shields). Class XGT: 1, A. Howgate (Stanley); 2, D. Smith (Killingworth); 3, R. Kirkup (Mount Pleasant). Breeders Tropical Egglayer: 1, E. Prytherch (Ashington); 2, Mr. Smith (Killingworth); 3, M. Strange (Basingstoke). Best Fish in Show (Class D): M. Moreland. Best Exhibitor gaining highest points: South Shields A.S. F.B.A.S. Championship Trophy awarded to Class D.

DELEGATES to Associated Goldfish Societies met in July under the chairmanship of

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Mr. Ramden of the Northern Goldfish and Pondkeepers Society.

The main item on the agenda was the selection of the colours to be recognised as the required ideals for goldfish. A copy of British Standard Printers Colours was provided by a delegate and these were carefully studied. It was decided that only three basic colours would be chosen, together with black, and these would be blue, red and yellow. It was recognised that the selection of intermediate colours could prove an almost impossible task due to the variation in shade that can be seen in the overlapping of only two colours. Each delegate selected his considered choice of ideal colour and wrote the colour shade reference number on a slip of paper. Each slip was handed to the Chairman who counted the majority preference, the minority being rejected, and a further vote taken of the selected shades after further study. This was continued until a clear cut majority was found, the final choice was then asked for approval by all delegates. In this method the colour of the ideal metallic type goldfish was selected, and approved, together with the basic colours of blue, red and yellow for the nacrous (calico), types of fancy goldfish. The final result, which took some time to arrive at, proved how effective the deliberations had been for the selected colours were very close to those much sought after colours that, in rare instances, have been seen in goldfish.

At the conclusion of the meeting everyone felt well satisfied in having taken the first step towards establishing a single set of standards that, it is hoped, will be accepted by all goldfish enthusiasts as the ideals at which all breeders and exhibitors would aim.

Delegates present represented the Association of Midland Goldfish Keepers, Bristol A.S., Goldfish Society of Great Britain, Midland Aquarium and Pool Society and the Northern Goldfish and Pondkeepers Society. They will next meet at Coventry on Sunday, the 17th October when the Common Goldfish will be considered under the chairmanship of Mr. Norman Giles of the A.M.G.K. The A.G.S. Nationwide Cup will be competed for, by members of affiliated societies, at Bristol A.S. Open Show on Saturday, 18th September, at Bishopston Parish Hall, Gloucester Road, Near Bristol. The class number 22 in the schedule, will be for Bristol shubunkins with a body length of over 3 inches and fierce competition is expected. This show will be devoted entirely to coldwater exhibits, the majority being fancy goldfish.

ENTRIES for the Romford and Becontree A.S. annual show totalled 255. Best Fish in Show award was won by W. R. Dale with a Thick Lip Gourami, and the final points positions for the society competition were as follows: Romford and Becontree, 122; Orpington, 63; Bethnal Green, 28; East London, 22; Ilford, 20; Southend and Leigh, 11.

Results: Class A: 1, D. Byfield (Romford and Becontree); 2, D. Deaman (Ilford); 3 and 4, F. Victory (Romford and Becontree). Class B: 1, M. Giddy (Ilford); 2, J. Risk (Romford and Becontree); 3, D. Durrant (Southend and Leigh); 4, P. Hines (Romford and Becontree). Class C: 1, P. Green (Independent); 2, P. Reed (Romford and Becontree); 3, A. Noronha (Orpington); 4, G. Steptow (Romford and Becontree). Class D: 1, 3 and 4, R. Jones (Romford and Becontree); 2, A. Noronha (Independent). Class D/A: 1 and 3, P. Green (Independent); 2, G. Reading (Romford and Becontree). Class E: 1, W. Dale (Bethnal Green); 2, A. Noronha (Orpington); 3, J. Risk (Romford and Becontree); 4, N. Curtis (Ilford). Class F: 1 and 4, R. Jones (Romford and Becontree); 2, S. Melbourne (Romford and Becontree); 3, D. Durrant (Southend and Leigh). Class G: 1 and 2, R. Jones (Romford and Becontree); 3, D. Durrant (Southend and Leigh); 4, A. Noronha (Orpington). Class H: 1, W. Dale (Bethnal Green); 2 and 3, A. Noronha (Orpington); 4, R. Jones (Romford and Becontree). Class J: 1 and 3, D. Byfield (Romford and Becontree); 2, P. Green (Independent); 4, D. Durrant (Southend and Leigh). Class K: 1, P. Hines (Romford and Becontree); 2 and 3, R. Jones (Romford and Becontree); 4, D. Byfield (Romford and Becontree). Class M:

1, 2 and 3, D. Byfield (Romford and Becontree); 4, P. Barrett (East London). Class NB/M: 1, 2 and 4, D. Byfield (Romford and Becontree); 3, A. Noronha (Orpington). Class NO/T: 1, 2, 3 and 4, A. Noronha (Orpington). Class O: 1, 2 and 3, A. Noronha (Orpington); 4, G. Crosby (Ilford). Class R: 1, A. Noronha (Orpington); 2, D. Byfield (Romford and Becontree); 3, P. Green (Independent); 4, G. Crosby (Ilford). Class S: 1, E. Ward (Romford and Becontree); 2, D. Byfield (Romford and Becontree). Class T: 1, 3 and 4, A. Noronha (Orpington); 2, T. Waller (East London). Class U: 1, F. Victory (Romford and Becontree); 2 and 3, T. Bullock (Bethnal Green). Class V: 1, 2 and 4, T. Bullock (Bethnal Green); 3, P. Reed (Romford and Becontree). Class W: 1, S. Hedges (Bethnal Green); 2 and 3, G. Crosby (Ilford); 4, D. Durrant (Southend and Leigh). Class XBM: 1, G. Reading (Romford and Becontree); 2 and 4, W. Paxon (East London); 3, D. Byfield (Romford and Becontree). Class XOT: 1, 2 and 3, A. Noronha (Orpington); 4, G. Crosby (Ilford). Class Z: 1, D. Byfield (Romford and Becontree); 2, S. Hedges (Bethnal Green); 3, G. Steptow (Romford and Becontree); 4, H. Compton (Romford and Becontree). Junior Tropical: 1, 2 and 3, P. Barrett (East London); 4, A. Walker (East London). Junior Coldwater: 1, K. Jones (Romford and Becontree); 2, A. Durrant (Southend and Leigh); 3 and 4, C. Stains (Independent).

THERE were over 550 entries for the annual Open Show of Accrington and District A.S. The best fish in the show was an Anabantid owned by Mr. and Mrs. Newson of Blackburn A.S. The results were as follows: Guppies: 1, A. Whitaker (Macclesfield, Section winner); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, R. Lamb (Southport). Molies: 1 and 2, J. Tinsley (Sandgrounders); 3, Poulton Bros. (Southport). Swordtails: 1, B. Davis (Stretford); 2, Mr. and Mrs. Campbell (Macclesfield); 3, Miss M. Burton (Accrington). Platies: 1, Mr. and Mrs. Welsh (York, Section winner); 2, T. and J. Selby (Wythenshawe); 3, K. Dingley (Heywood). A.O.F. Livebearer: 1, A. Macdonald (Oldham); 2, Mr. and Mrs. Tasker (Sandgrounders); 3, W. Hayes (Leyne). Characins (up to 3 in.): 1, Mr. and Mrs. Goddard (Macclesfield, Section winner); 2, R. J. Stevens (Blackburn); 3, Mr. and Mrs. Smith (Oram). Characins (over 3 in.): 1, Mr. and Mrs. Houghton (Southport); 2, Mrs. G. Frisby (Hull); 3, Mr. and Mrs. Ham (Lytham). Goldfish (up to 3 in.): 1, T. Hampton (Merseyside, Section winner); 2, Mr. and Mrs. Lloyd (Wynnstay); 3, Mr. and Mrs. Gough (Wynnstay). Goldfish (over 3 in.): 1, Mr. and Mrs. J. Taylor (Merseyside); 2, I. Howrath (Accrington); 3, Mr. and Mrs. Campbell (Macclesfield). Rift Valley Goldfish: 1, S. Weinstenholme (Heywood); 2, A. Frisby (Hull); 3, B. Taux (Merseyside). Angels: 1, Mr. and Mrs. Muckle (Southport, Section winner); 2, P. Myerscough (Accrington); 3, Mr. Batchelor (Leyne). Barbs (up to 3 in.): 1, M. Burton (Accrington); 2, Mr. and Mrs. Houghton (Southport); 3, M. Hay (Oldham). Barbs (over 3 in.): 1, A. Chadwick (Oldham, Section winner); 2, B. Davis (Stretford); 3, Mr. and Mrs. G. Brown (Accrington). Aphysocentrus Toothcarps: 1, K. Kryser (Wrexham, Section winner); 2, Mr. and Mrs. Taylor (Merseyside); 3, Mr. and Mrs. Tasker (Sandgrounders). A.O.F. Toothcarps: 1 and 2, Mrs. Hardcastle (Aireborough); 3, M. Hay (Oldham). Carps and Minnows: 1, Mr. and Mrs. Newson (Blackburn, Section winner); 2, Mr. and Mrs. Muckle (Southport); 3, Mr. and Mrs. Holden (Southport). Laboas Foxes and Sharks: 1, Mr. and Mrs. Houghton (Southport); 2, M. Ponnall (Stretford); 3, B. Dawson (Heywood). Danies: 1 and 2, Mr. and Mrs. Newson (Blackburn); 3, A. Bolas (Wythenshawe). Rasboras: 1, T. and J. Selby (Wythenshawe, Section winner); 2, I. Hopkins (Merseyside); 3, W. Hayes (Leyne). Siamese Fighters: 1, P. Atkinson (Southport, Section winner); 2, T. Davis (Heywood); 3, Mr. Lowe (Habifax). Anabantids (up to 3 in.): 1, F. Mulla (Merseyside); 2, I. Hopkins (Merseyside); 3, Mr. and Mrs. Riley (Castleford). Anabantids (over 3 in.): 1, Mr. and Mrs. Newson (Blackburn, Best in Show); 2, Mr. and Mrs. Riley (Castleford);

3, Mr. and Mrs. Goddard (Macclesfield). *Pairs (Livebearers)*: 1, T. Hampton (Merseyside, Section winner); 2 and 3, T. and J. Selby (Wythenshawe). *Pairs (Egglayers)*: 1 and 3, R. Stevens (Blackburn); 2, W. Hayes (Loyne). *Breeders (Livebearers)*: 1 and 2, Poulton Bros. (Southport); 3, Mr. and Mrs. Campbell (Macclesfield). *Breeders (Egglayers)*: 1, D. Wilson (Merseyside); 2, D. Richardson (Blackburn); 3, J. Wood (Aireborough). *Breeders (Egglayers)*: 1, K. Kryser (Wrexham, Section winner); 2, P. Squirrel (Wythenshawe); 3, G. Hill (Accrington). *Catfish and Loach* (up to 3 in.): 1, Mr. and Mrs. Muckle (Southport); 2, Mr. and Mrs. Ham (Lytham); 3, J. Boothman (Accrington). *Catfish and Loach* (over 3 in.): 1, Mr. and Mrs. Newson (Blackburn, Section winner); 2, Mr. and Mrs. Houghton (Southport); 3, P. and H. Batchelor (Loyne). *A.O.V. Tropical*: 1, P. Walsh (Blackburn); 2, P. and H. Batchelor (Loyne); 3, J. Wood (Aireborough). *A.V. Marine*: 1 and 3, Mr. and Mrs. Davis (Dunlop, Section winner); 2, J. Midgley (Wythenshawe). *Junior*: 1, B. Davis (Stretford); 2, W. Hayes (Loyne); 3, I. Hopkins (Merseyside). *Ladder*: 1, Mrs. Gough (Wymsey, Section winner); 2 and 3, Mrs. Muckle (Southport). *Furnished Mini-Tars*: 1, M. Wild (Accrington, Section winner); 2, R. Lamb (Southport); 3, E. Birchwood (Oldham). *Coldwater Section Common Goldfish*: 1, R. J. Holroyd (Mosecomb); 2, Mr. and Mrs. Houghton (Southport); 3, R. Dingley (Heywood). *Moss*: 1 and 3, S. Foote (Accrington); 2, C. Wallbank (Blackburn). *Veinfin*: 1, S. Foote (Accrington); 2, Mr. and Mrs. Duckworth; 3, S. Foote (Accrington). *Keel Carp*: 1, S. Walsh (Accrington); 2 and 3, C. Wallbank (Blackburn). *Fantail*: 1, S. Walsh (Accrington, Best Coldwater Fish); 2, B. Howarth (Accrington); 3, C. Wallbank (Blackburn). *Ovarian*: 1, M. Wild (Accrington); 2, P. Squirrel (Wythenshawe); 3, R. Dingley (Heywood). *Livebearers*: 1, Mr. and Mrs. Duckworth; 2, Mr. and Mrs. Duckworth; 3, A.O.V. Goldwater: 1 and 2, Mr. and Mrs. Harvey (Sandgrounders); 3, A. Whittaker (Macclesfield). *A.V. Fancy Goldfish*: 1 and 2, S. Foote (Accrington). *Singular Breeders*: 1, S. Foote (Accrington, Section winner).

**MEMBERS of the Blackburn Aquarist Water Life Society** visited Keith Barracough's (Bradford) early in July. Included in this enjoyable trip was a visit to his King British works where they saw his fish lake food being made. New members would be most welcome and are requested to contact Mr. A. Thomas, 29 Emily Street, Blackburn.

AT a recent meeting of the **Accrington A.S.** the lecture was given by Mr. Ashton, a member on how to photograph fish. He also mentioned that he had plans to make a film on one of the members setting up an aquarium. The tabular results were as follows: A.O.V. Coldwater: 1, B. Howarth; 2, S. Foote. A.O.V. Tropical: 1, P. Myerscough (Angel Fish—Best in Show); 2, N. Holden; 3, G. Hill. *Pairs*: 1, S. Carter; 2, C. Whitley; 3, N. Holden. First in the breeders section went to Mr. Hill with a team of neon tetras. Meetings are held at the Great Eastern Hotel, Arnold Street, Accrington on the second Wednesday in each month and everyone is welcome.

THERE were 624 entries for the **Scarborough and District A.S.** open show in July making it a very successful venture. Best Fish in Show was an orphoides barb belonging to M. Jordan of Hedlington and District A.S. Results were: Guppy: 1, Mrs. Greenwood (Immingham); 2, Mr. and Mrs. Roberts (Doncaster); 3, S. Harrison (Grimsby and Cleethorpe). Molly: 1, Miss A. and Miss L. Petty (Castleford); 2, Miss S. McBride (Aireborough); 3, Mr. and Mrs. Richardson (Scarborough). Swordtail: 1 and 3, Mr. and Mrs. Kirk (S. Humberside); 2, Mr. and Mrs. Blades (Bassetlaw). Platy: 1, Mr. and Mrs. K. Petty (Castleford); 2, Mr. and Mrs. Goulding (Immingham); 3, G. Plinton (Scarborough). A.O.V. Livebearer: 1, G. Plinton (Scarborough); 2, Mr. and Mrs. Daines (Doncaster); 3, Master J. Emerson (Castleford). Characin (Small): 1, Binns and Caldwell (Scunthorpe Museum);

2, Mr. and Mrs. Mortimer (Bridlington); 3, K. Webb (Scarborough). Characin (Large): 1 and 2, Mr. and Mrs. Daines (Doncaster); 3, Mr. and Mrs. Snowden (York and District). Barbs (Small): 1, Mr. and Mrs. Emerson (Castleford); 2, T. Collingwood (Hull); 3, M. Price (Castleford). Barbs (Large): 1, M. Jordan (Bridlington); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Elliker (Scarborough). Ras. Dan. Min.: 1, A. Stevens (Middlesborough); 2 and 3, Mr. and Mrs. Lake (S. Humberside). E.L.T.C.: 1, Mr. and Mrs. Blades (Bassetlaw); 2, A. Young (Hull); 3, Mr. and Mrs. Tyson (S. Humberside). Angels: 1, Binns and Caldwell (Scunthorpe Museum); 2, J. Whitley (Aireborough); 3, Mr. Shaw (York and District). Dwarf Cichlid: 1, Mr. and Mrs. Blades (Bassetlaw); 2, Mr. Sowersby (Scarborough); 3, Mr. and Mrs. Cougill (Retford). Large Cichlid: 1, I. Bellard (Hull); 2, J. Burnham (Scarborough); 3, S. Gregory (Scarborough). Rift Valley: 1, I. Taylor (Bridlington); 2, Mr. and Mrs. Cougill (Retford); 3, T. Collingwood (Hull). Anabantid (Small): 1, Mr. and Mrs. Goulding (Immingham); 2 and 3, Mr. and Mrs. Petty (Castleford). Anabantid (Large): 1, Mr. and Mrs. Peasey (Doncaster); 2, Mr. G. Plinton (Scarborough); 3, Mr. and Mrs. Davesport (S. Humberside). Fighters: 1, Mrs. Simons (Scarborough); 2, Mr. Barker (York and District); 3, Mr. Gatenby (Bradford). Corydoras and Brochis: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. and Mrs. Petty (Castleford); 3, C. Garrick (Castleford). A.O.V. Cat: 1, H. Thorpe (Doncaster); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Lake (S. Humberside). Loaches and Botias: 1 and 2, Binns and Caldwell (Scunthorpe Museum); 3, T. Sanderson (Thorne). Sharks and Foxes: 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Goulding (Immingham). A.O.V. Tropical: 1, Mr. and Mrs. Richardson (Scarborough); 2, I. Bellard (Hull); 3, Mr. and Mrs. K. Welsh (York and District). Breeders Livebearers (1-10): 1, B. Jackson (Doncaster); 2, Mr. and Mrs. Richardson (Scarborough); 3, K. Lancashire (Doncaster). Breeders Livebearers (11-20): 1, B. Jackson (Doncaster); 2, K. Lancashire (Doncaster). Breeders Egglayers (1-10): 1, B. Jackson (Doncaster); 2, Mr. Wood (Aireborough); 3, Mr. and Mrs. Scarth (B.K.A.). Breeders Egglayers (11-20): 1, D. Greenwood (Immingham); 2, B. Jackson (Doncaster); 3, J. Burnham (Scarborough). *Pairs (Livebearers)*: 1, Mr. and Mrs. Low (Cleveland); 2, B. Jackson (Doncaster); 3, Mr. and Mrs. Daines (Doncaster). *Pairs (Egglayers)*: 1, C. Garrick (Scarborough); 2, Mr. and Mrs. Copley (Doncaster); 3, A. Stevens (Middlesborough). Goldfish and Shubunkins: 1, Mrs. Hill (Aireborough); 2, L. Waller (Rotherham); 3, Pete and Silvia (Bridlington). A.O.V. Coldwater: 1, Mr. and Mrs. Blades (Bassetlaw); 2, K. and M. Wood (York and District); 3, D. W. Jordan (S. Humberside).

MEETINGS covering a wide range of subjects have been held by members of the **Welwyn Garden City A.S.** over the last five months. The one on "Making your own glass tanks," by a founder club member L. Bracey proved so popular that he was asked to repeat it again within three months. He made two tanks on each occasion, one for the member requesting the lecture and one to be raffled.

A. Sweetman gave an interesting lecture on "Show Judging"; he brought along several specimens for members to judge, and then assessed their performance. Everyone learned a great deal from his lecture. R. Forder gave an invitation to club members to visit his home, which was duly accepted; when he lectured about plant and fishkeeping in his establishment, many ideas and very helpful information were given to the members.

When the annual furnished show (a competition) took place, E. Swift the club secretary lost his cup to D. Pitts, this year's winner. With a film and slide show plus an evening of general discussion most members interests have been catered for. The club reassembles on 6th September at the Scout Hut Great Dell, Welwyn Garden City, after the summer recess.

THE chairman of the **Grantham and District A.S.** Mr. J. Jones was unable to attend the open show owing to illness. He has just come out of hospital after an operation having been ill for a long time (about five months) and would like to thank all aquarists for their messages and well wishes. This is the first show he has missed. The results were as follows:

*Plants*: 1, W. Blundell (Doncaster); 2, Mr. and Mrs. Kirk (S. Humberside); 3, Mr. and Mrs. Goulding (Immingham). *Adults*: 1, P. Smith (Scunthorpe and Dist.); 2, Mr. and Mrs. Chamberlain (Leamington and Dist.); 3, Mr. and Mrs. J. Riley (Castleford). *Scorpaenid*: 1, Mr. and Mrs. Kirk (S. Humberside); 2, N. Benkin (Bridlington); 3, K. Prendergast (Boston). *Guppies*: 1, S.M.L.N. (Nuneaton); 2, J. Hall (S. Humberside); 3, Mr. and Mrs. Roberts (Doncaster). *A.O.V. Livebearers*: 1, B. Jackson (Doncaster, Section winner); 2, O. Onslow (Loughborough); 3, G. Allen (S. Humberside). *Small Characins*: 1, Mr. and Mrs. Roberts (Doncaster); 2, Mr. and Mrs. Tyson (S. Humberside); 3, Mr. and Mrs. A. Binns (Scunthorpe Museum). *Large Characins*: 1 and 2, Mr. and Mrs. Daines (Doncaster, Section winner); 3, G. Allen (S. Humberside). *Small Barbs*: 1, Mr. Elliott (Corby, Section winner); 2, D. and W. Jordan (S. Humberside); 3, Mr. and Mrs. Tyson (S. Humberside). *Large Barbs*: 1 and 3, W. H. Neville (Grantham); 2, D. Jones (Darnce). *Dwarf Cichlids*: 1, Mr. and Mrs. Morrissey (Immingham); 2, D. and W. Jordan (S. Humberside); 3, A. Clayton (Immingham). *Large Cichlids*: 1, A. Cook (Retford); 2, L.E.E.S. (Corby); 3, R. Riley (Immingham). *Angels*: 1 and 3, Mr. and Mrs. Sellars (Lincoln); 2, Mr. and Mrs. P. Mangles (Retford). *Rift Valley Cichlids*: 1, Mr. and Mrs. Sellars (Lincoln, Section winner); 2 and 3, A. Frisby (Hull). *Corydoras*: 1, W. Blundell (Doncaster); 2 and 3, S.M.L.N. (Nuneaton). *A.O.V. Goldfish*: 1, Mrs. G. Frisby (Hull, Section winner); 2, Mr. Campbell (Corby and Dist.); 3, W. Blundell (Doncaster). *Loaches*: 1 and 3, Mr. and Mrs. A. Binns (Scunthorpe Museum); 2, Mr. and Mrs. Daines (Doncaster). *Killifish*: 1, B. Sleight (Mexborough, Section winner); 2, Mr. and Mrs. A. Binns (Scunthorpe Museum); 3, J. Banks (Mexborough). *Albinoes and Danios*: 1, Master S. White (Retford); 2, A. Clayton (Immingham); 3, J. Husband (Boston). *Rasbora*: 1, Master S. White (Retford); 2, Mr. and Mrs. Tyson (S. Humberside); 3, A. Clayton (Immingham). *Sharks*: 1, R. Elliott (Corby and Dist., Section winner); 2, Mr. and Mrs. Copley (Doncaster); 3, M. Woods (Thorne). *Foxes*: 1, Master S. White (Retford); 2, Mr. and Mrs. C. Bailey (Grantham); 3, R. M. and M. A. Wacey (Grantham). *Fighters*: 1, A. Clayton (Immingham, Section winner); 2, Master C. Mangles (Retford); 3, Mr. and Mrs. Newson (S. Humberside). *A.O.V. Anabantid*: 1, Mr. and Mrs. Chamberlain (Leamington, Section winner); 2, Mr. and Mrs. K. Berry (Scunthorpe); 3, Mr. and Mrs. Peasey (Doncaster). *Breeders Livebearers* (1-10): 1, S.M.L.N. (Nuneaton); 2 and 3, K. Prendergast (Boston). *Breeders Egglayers* (1-10): 1 and 2, B. Jackson (Doncaster); 3, Mr. and Mrs. Copley (Doncaster). *Breeders Egglayers* (11-20): 1, L.E.E.S. (Corby and Dist.); 2, Master S. White (Retford); 3, Mr. and Mrs. Chamberlain (Leamington). *Pairs (Livebearers)*: 1, A. Clayton (Immingham); 2, N. Benkin (Bridlington); 3, Mr. and Mrs. Daines (Doncaster). *Pairs (Egglayers)*: 1, Mr. and Mrs. Lake (S. Humberside, Section winner); 2, Mr. and Mrs. Caldwell (Scunthorpe Museum); 3, A. Frisby (Hull). *A.O.V. Tropical*: 1, Mr. Simpson (Queen of Midlands, Section winner); 2, Mr. and Mrs. Chamberlain (Leamington); 3, Mr. and Mrs. Bradshaw (Sheaf Valley). *Novice Livebearer*: 1, D. Hargreaves (Immingham). *Novice Egglayer*: 1, Miss P. Short (Nuneaton, Section winner); 2, G. Woolley (Corby and Dist.); 3, Lisa Gardner (Grantham). *Goldfish and Comets*: 1, L. Waller (Rotherham); 2, Shilton and Mayer (Independent); 3, D. Frost (Grantham). *Shubunkins and Fancy Goldfish*: 1, S. Gardner (Grantham); 2, D. Frost (Grantham); 3, Shilton and Mayer (Independent). *A.O.V. Coldwater*: 1, W. Blundell (Doncaster, Section winner); 2, D. and W. Jordan (S. Humberside); 3, S.M.L.N. (Nuneaton). *Junior Livebearer*: Master A. Peasey

(Doncaster); 2 and 3, Master I. Short (Nun-caton). *Junior Egglayers*: 1, S. Elliott (Crosby and Dist., Section winner); 2, J. Sieve Wright (Corby and Dist.); 3, Master M. Lake (S. Humber-side). *Brooders Livebearers*: 1, Master S. White (Retford); 2, Mr. and Mrs. Bradshaw (Sheaf Valley); 3, R. M. and M. A. Wacey (Grantham). *Small Anabantids*: 1, A. Clayton (Immingham, Best Fish in Show Honey Gourami); 2, Master S. White (Retford).

**RESULTS of the Taunton and District A.S. July Table Show** were as follows: Barbs (under 3 in.): 1, B. Hancock; Barbs (over 3 in.): 1, B. Hancock; 2, D. Curry; Catfish and Loaches: D. Curry; Danios: 1, 2, 3 and 4, C. Vellacott; Labos: D. Curry.

**DETAILS of the Lytham A.S. Open Show** held in July were as follows: Furnished Minis-jars: 1, 2 and 3, E. Jones (Wrexham Section winner); Guppies: A. Darby (Hyde); 2, K. Thompson (Merseyside); 3, Mr. Parr (Hyde). Mollies: 1 and 2, J. Tinsley (Sandgrunder); 3, N. Wallbank (Loyne). Swordtails: 1, J. Bate (Sandgrunder); 2, T. Faux (Merseyside); 3, Mr. and Mrs. Harvey (Sandgrunder). Platies: 1, P. and A. Squirrel (Wythenshawe); 2, K. Thompson (Merseyside); 3, F. Mulla (Merseyside). A.O.V. Livebearer: 1, K. McBride (Aireborough Section winner); 2, C. Whitney (Accrington); 3, Mr. Wood (Aireborough). Characin (Small): 1, K. Thompson (Merseyside Section winner); 2, N. and M. Rimmer (Sandgrunder); 3, Mr. and Mrs. Houghton (Southport). Characin (Large): 1, Mr. and Mrs. Houghton (Southport); 2, Mr. and Mrs. Ham (Lytham); 3, Mr. and Mrs. Baldwin (Sandgrunder). Barbs (to 3 in.): 1, Mr. and Mrs. Houghton (Southport); 2, A. Darby (Hyde); 3, R. Jervis (Sandgrunder). Barbs (over 3 in.): 1 and 2, A. Vaisier (Merseyside Section winner); 3, Mr. and Mrs. A. Goddard (Macclesfield). Rasboras: 1, Miss S. Goddard (Macclesfield); 2, T. and J. Selby (Wythenshawe); 3, C. Hilton (Lytham). Damio: 1, Mr. and Mrs. Baldwin (Sandgrunder); 2, A. and D. Bolan (Wythenshawe); 3, Mr. and Mrs. Newton (Blackburn). Minnows: 1, Mr. and Mrs. Newton (Blackburn Section winner); 2, and 3, Mr. and Mrs. Houghton (Southport). Angels: 1, L. Odham (Wythenshawe); 2 and 3, G. Boys (Lytham). Dwarf Cichlids: 1, P. Walsh (Blackburn); 2 and 3, T. Hampton (Merseyside). Large Cichlids: 1, S. Wolstenholme (Heywood Best in Show and Section winner); 2, Mr. and Mrs. J. Taylor (Merseyside); 3, B. M. Stillwell (Sandgrunder). Fighters: 1, P. Tomlinson (Macclesfield); 2, Mr. and Mrs. Baldwin (Sandgrunder); 3, R. Jans (Merseyside). A.O.V. Anabantids: 1, Mr. Illis (Otram Section winner); 2, F. Mulla (Merseyside); 3, B. M. Stillwell (Sandgrunder). A.O.V. Catfish: 1, Mr. and Mrs. Houghton (Southport); 2 and 3, Mr. and Mrs. Newton (Blackburn). A.V. Loach: 1, Mr. and Mrs. P. Ham (Lytham); 2, I. Hopkins (Merseyside); 3, S. Wolstenholme (Heywood). A.V. Labeo or Shark: 1, Mr. and Mrs. Baldwin (Sandgrunder Section winner); 2, B. Dawson (Heywood); 3, D. Wright (Independent). Corydoras: 1, T. Hampton (Merseyside); 2, P. and H. Bachelor (Loyne); 3, Mr. Baldwin (Sandgrunder). Flying Fox: 1, T. and J. Selby (Wythenshawe); 2, B. Dawson (Heywood); 3, E. Hampson (Wythenshawe). Toothcarps: 1 and 3, F. Reynolds (B.K.A. Section winner); 2, Mr. Hardcastle (Aireborough). A.O.V. Tropical: 1, P. Walsh (Blackburn); 2, Mr. and Mrs. Baldwin (Sandgrunder); 3, P. and H. Bachelor (Loyne). Egglayers (Section): 1 and 2, A. Vaisiere (Merseyside Section winner); 3, T. Hampton (Merseyside). Egglayers (Easy): 1, D. Wilson (Merseyside); 2, Mr. Wood (Aireborough); 3, R. Green (Independent). Livebearers: 1 and 3, Poulton Broad (Southport); 2, C. Bivson (Sandgrunder). Pairs (Egglayers): 1, A. Vaisiere (Merseyside Section winner); 2, R. and A. Johnson (Hyde); 3, Mr. and Mrs. Houghton (Southport). Pairs (Livebearers): 1, J. and J. Selby (Wythenshawe); 2, T. Hampton (Merseyside); 3, N. and M. Rimmer (Sandgrunder). Goldfish and Comets: 1, Mr. and Mrs. Wolstenholme (Blackburn); 2, B. G. Holroyd (Morecambe Bay);

3, B. Dawson (Heywood). Shubunkins: 1 and 2, C. Whitney (Accrington); 3, Mr. and Mrs. Wolstenholme (Blackburn). Veiltail-Pantail—Moors: 1, Mr. and Mrs. Wolstenholme (Blackburn Section winner); 2, Mr. Wood (Aireborough); 3, A. Dawson (Heywood). A.O.V. Coldwater: 1, Mr. and Mrs. Wolstenholme (Blackburn); 2, B. G. Holroyd (Morecambe Bay); 3, G. Whitney (Accrington). Juniors (Egglayers): 1, N. and M. Rimmer (Sandgrunder Section winner); 2, Miss S. McBride (Aireborough); 3, P. and S. Taylor (Merseyside). Juniors (Livebearers): 1, I. Hopkins (Merseyside); 2, Miss S. McBride (Aireborough); 3, Mrs. P. and S. Taylor (Merseyside). Junior (Coldwater): 1, D. Harvey (Sandgrunder); 2 and 3, D. Cartmell (Lytham). A.V. Marmoset: 1, J. Midgley (Wythenshawe Section winner); 2, P. and A. Squirrel (Wythenshawe).

**COMMITTEE** members elected at the annual general meeting of the **Llantwit Major A.S.** which was held in July were as follows: Chairman, J. Thomson; Vice-Chairman, A. Ibbertson; Secretary, E. A. Hillman; Treasurer, H. Chick; Minutes Secretary, Mrs. J. Fry; P.R.O., E. A. Hillman; Show Secretary, J. Edwards; Glasgow, Mill Park, Cowbridge, Glam., S. Wales. Asst. Show Secretary, J. F. Edwards; C.N.A.A. Reps., J. Thomson and A. Ibbertson; Librarian, G. Lewis; Sales Manager, L. Dyson. During the table show judging, N. Haley gave a most interesting talk and demonstration on construction and design of show tanks. Table show results: Class Q-R and S: 1, 3 and 4, H. Chick; 2, Master R. Davis. A.O.V.: 1, Miss D. Lewis; 2, 3 and 4, G. Lewis.

**THERE** has been a change of secretary in the **British Discus Association** and Mr. L. Dams, 52 Beech View Road, Kingsley, Warrington, Cheshire is now occupying this office. Mr. Edward Schulze has agreed to become the President and Mr. Frank Ashworth is still very much involved with the technical and fish-keeping side. Membership is gradually increasing and meetings are being planned for the winter months.

**AT** the July meeting of the **Dorchester and District A.S.** a short talk was given by Mr. Fitzgerald on how to prepare fish for a show. The table show results were: Labyrinths, Junior: 1, R. Thompson; 2 and 3, M. and S. Ackerman; 4, G. Moorcroft. Senior: 1 and 2, Mr. and Mrs. D. Young; 3 and 4, C. Ackerman. Ladies Night (Any Variety): 1, Mrs. Angel; 2, A. Young; 3, B. Jefferies.

**THE** third annual open show of the **Malvern and District A.S.** was a great success, and the results were: Guppies: 1, Mrs. C. Darby (Wombourne); 2, J. V. Walton (Malvern); 3, Mrs. L. Jenkins (Cheltenham). Mollies: 1, Mrs. Chamberlain (Leamington); 2, R. Holder (Cheltenham); 3, G. W. Roan (Malvern). Swords: 1 and 2, J. Bartlett (Gloucester); 3, D. Parry (Gloucester). A.O.V. Livebearers: 1 and 2, D. Parry (Gloucester); 3, Mr. and Mrs. Marson (N.W.A.S.). Barbs (under 3 in.): 1 and 2, Mrs. C. Darby (Wombourne); 3, Mr. and Mrs. Chamberlain (Leamington). Barbs (over 3 in.): 1, J. V. Walton (Malvern); 2, Mrs. C. Darby (Wombourne); 3, Mr. and Mrs. Marson (N.W.A.S.). Rasboras, Danios, Minnows: 1 and 2, Mr. and Mrs. Chamberlain (Leamington); 3, Mrs. L. Jenkins (Cheltenham). H.H.D.C.: 1, D. Williams (Malvern); 2, D. Parry (Gloucester); 3, Tracy and Jenny Roan (Malvern). A.O.V. Characins: 1, D. Parry (Gloucester); 2, A. Bailey (N.W.A.S.); 3, Mrs. L. Jenkins (Cheltenham). Dwarf Cichlids: 1, A. Alcock (N.W.A.S.); 2, K. and N. Owen (Bath); 3, M. Copson (Malvern). A.O.V. Cichlids: 1, A. Alcock (N.W.A.S.); 2, J. V. Walton (Malvern); 3, Mr. and Mrs. Marson (N.W.A.S.). Anabantids (over 4 in.): 1, Mr. and Mrs. Chamberlain (Leamington); 2, D. Williams (Malvern); 3, Mrs. Chamberlain (Leamington). Ceydoras and Brochis: 1, Mrs. Marson (N.W.A.S.); 2, Smith and Savage (Rugby); 3, P. Mills (N.W.A.S.). A.O.V. Catfish: 1, Mrs. C. Darby (Wombourne); 2, J. V. Walton (Malvern); 3, J. Mason (Malvern). Botias, Loaches and Sharks: 1, D.

Parry (Gloucester); 2, A. Alcock (N.W.A.S.); 3, C. Darby (Wombourne). Sexed Pairs (Livebearers): 1, J. V. Walton (Malvern); 2, D. Williams (Malvern). Sexed Pairs (Egglayers): 1, P. Greenwood (Cheltenham); 2, Mr. and Mrs. Marson (N.W.A.S.); 3, Mrs. L. Jenkins (Cheltenham). A.O.V. Tropical: 1, Mrs. Chamberlain (Leamington); 2, Smith and Savage (Rugby); 3, J. V. Walton (Malvern). Best Fish in Show: D. Parry (Gloucester). Club Perpetual Trophy for Most Points: Malvern and District A.S.

**IN** July **Meerth A.S.** heard a lecture on Killifish with a slide show which was given by Mr. M. Addicot. The Club Competition was for A.O.V. Livebearers and the results were: 1, R. Parry; 2 and 3, Master B. Bow; 4, Mrs. M. Davies Joint 4th M. and C. Mollan.

**THERE** was a recorded entry of 682 for the annual open show and exhibition of **Brighton and Southern A.S.** The highest pointed society was Brighton 34pts., but the trophy was given to the highest pointed visiting society which was Orpington with 31 pts. All trophies and prizes were given by the president Miss Dora Bryan.

**F.B.A.S. Championship** class won by M. Nethersell (Riverside). Best Fish in Show won by Miss J. Mills (Southampton).

**Results:** Furnished Aquarium: 1, R. Paine (Halemere); 2, Mr. and Mrs. Rooney (Brighton). Class B: 1, Miss J. Mills (Southampton); 2, R. Adams (Salisbury); 3, J. Brown (Croydon); 4, Mr. and Mrs. Rooney (Brighton). Class C: 1, R. and C. Howe (Newbury); 2, J. Brown (Croydon); 3, H. Doer (Reading); 4, P. Edwards (Thanet). Class CA: 1, Mrs. Nethersell (Riverside); 2, Mrs. Edwards (Thanet); 3, R. Mart (Hounslow); 4, K. Scoly (N. Kent). Class D: 1, T. Ramshaw (Brighton); 2, T. Fraser (Basingstoke); 3, F. Willis (Havant); 4, C. Thorps (Gosport). Class DB: 1, M. Strange (Basingstoke); 2, Mrs. Beattie (Godalming); 3, B. Smith (Southend); 4, Mr. and Mrs. Hooper (Brighton). Class DC: 1 and 2, W. Knight (Gosport); 3, S. Pitcher (Salisbury); 4, K. Conolly (Gosport). Class E: 1, R. and C. Howe (Newbury); 2, R. Adams (Salisbury); 3, J. Brown (Croydon); 4, C. Finnis (Strood). Class EA: 1, D. Jackson (Salisbury); 2, J. Wilkinson (Sudbury); 3, W. Knight (Gosport); 4, D. Mills (Southampton). Class F: 1, Mr. and Mrs. Shiner; 2, D. Jackson (Salisbury); 3, G. Sandford (Redhill and Reigate); 4, B. Barford (Saracens). Class G: 1, M. Sandford (Redhill and Reigate); 2, B. Fry (Bexleyheath); 3, G. Nichols (Mid Kent). Class H: 1, T. Cruickshank (Ealing); 2, K. Nichols (Mid Kent); 3, M. Nethersell (Riverside); 4, B. Sayer (Brighton). Class MA: 1 and 4, M. Nethersell (Riverside); 2, J. Carpenter (Newbury); 3, T. Fraser (Basingstoke). F.B.A.S. Championship Class, Class J: 1, A. Weaire (Southampton); 2, and 4, L. Yates (Petersfield); 3, T. Fraser (Basingstoke). Class K: 1, Mrs. Greenhalf (Bexleyheath); 2, R. Rice (Brighton); 3, A. Weaire (Southampton); 4, J. Brown (Croydon). Class L: 1, A. Gardener (Redhill and Reigate); 2, A. Peat (Tonbridge); 3, D. Wither (East Dulwich); 4, Mr. Pannell (East Dulwich). Class M: 1, Mr. and Mrs. Rooney (Brighton); 2, V. Connelly (Gosport); 3, T. Ramshaw (Brighton); 4, K. Nichols (Mid Kent). Class NB: 1, D. Jackson (Salisbury); 2, K. Dryans (Croydon); 3, T. and J. Ramshaw (Brighton); 4, P. Chapman (Brighton). Class NO: 1 and 2, A. Noronha (Orpington); 3 and 4, D. Chewright (Southend). Class O: 1, A. Sharp (Southend); 2, K. Connelly (Gosport); 3, Mrs. Jupe (Gosport); 4, L. Yates (Petersfield). Class P: 1, T. Asquith (S.H.L.A.S.); 2 and 3, A. Sharp (Southend); 4, Mr. and Mrs. Hooper (Brighton). Class Q: 1 and 4, A. Noronha (Orpington); 2, M. Collins (Mid Kent); 3, P. Hampson (Hounslow). Class R: 1, C. Finnis (Strood); 2, H. Wannerton (Petersfield); 3, K. Saxby (N. Kent); 4, T. Moulton (Godalming). Class S: 1, J. Smith (Brighton); 2 and 4, S. Spicer (Southend); 3, Mr. and Mrs. Stacey (Petersfield). Class T: 1, 3 and 4, A. Noronha (Orpington); 2, Mrs. Cruickshank (Ealing). Class XBM: 1, M. Strange (Basingstoke); 2, Mr. and Mrs. Houghton (Brighton); 3, F. Willis (Havant);

4, Mr. and Mrs. Shiner. Class XOT: 1 and 2, A. Noronha (Orpington); 3, R. Canning; 4, C. Goddard (Sudbury). Class Ua-B: 1, D. Jackson (Salisbury); 2, W. Crookboro (Petersfield); 3, G. Binstead (Portsmouth); 4, B. Fry (Bexleyheath). Class U-C: 1, E. Binstead (Portsmouth); 2 and 4, W. Crookboro (Petersfield); 3, B. Fry (Bexleyheath). Class V: 1 and 2, Mrs. S. Gardner (Redhill); 3, E. Binstead (Portsmouth); 4, T. Aspinall. Class W: 1, D. Aradell (Gosport); 2, J. Tupe (Gosport); 3, B. Fry (Bexleyheath); 4, W. West (Salisbury).

**RESULTS of Inter-Society between Sheaf Valley A.S. and Mexboro A.S. were as follows:** Corydoras: 1, D. Harris (Mexboro); 2, G. Craven (Mexboro); 3, D. and M. Laycock (Sheaf Valley). Small Barbs: 1, J. Banks (Mexboro); 2, B. Sleight (Mexboro); 3, Mrs. Toyne (Sheaf Valley). Fighters: 1, B. Sleight (Mexboro); 2, J. Banks (Mexboro); 3, K. Chapman (Mexboro). Small Characins: 1, Mr. and Mrs. Moore (Sheaf Valley); 2, D. and M. Laycock (Sheaf Valley); 3, D. Harris (Mexboro). Dwarf Cichlids: 1, G. Craven (Mexboro); 2, A. Gilbert (Mexboro); 3, G. Bradshaw (Sheaf Valley). Mini Jars: 1, G. Craven (Mexboro); 2, A. Taylor (Mexboro); 3, Mrs. Toyne (Sheaf Valley). There were 70 entries.

A VERY successful first open show was held by the **South Humberside A.S.** and the results were as follows: Guppies: 1, Mr. and Mrs. Richmond (Retford); 2, Binns and Caldwell (Scunthorpe Museum); 3, S. and P. Ipakchi (Sheaf Valley). Platies: 1, S. and P. Ipakchi (Sheaf Valley); 2, Mr. Hawdon (Grimsby and Cleethorpes); 3, K. Prestagast (Boston). Swords: 1 and 3, G. Andrews (Hull); 2, Mr. and Mrs. Kirk (S. Humberside). Mollys: 1, P. Smith (Scunthorpe and Dist.); 2, Mr. and Mrs. Lake (S. Humberside); 3, G. Hoodless (Scunthorpe and Dist.). A.O.V. Livebearers: 1, B. Jackson (Doncaster); 2, A. Piggott (Grimsby and Cleethorpes); 3, Mr. and Mrs. Fletcher (Doncaster). Small Characins: 1 and 2, Binns and Caldwell (Scunthorpe Museum); 3, Mr. and Mrs. Richardson (Scarborough). Large Characins: 1, H. Thorpe (Doncaster); 2, G. Hoyland (Don Valley); 3, Mr. and Mrs. Tyson (S. Humberside). Dwarf Cichlids: 1, D. Ramon (Grimsby and Cleethorpes); 2, J. White (S.D.A.S.); 3, Mr. and Mrs. Morrissey (Immingham). Rift Valley Cichlids: 1, Mr. and Mrs. P. Berry (Scunthorpe and Dist.); 2, Mr. and Mrs. Sellers (Lincoln); 3, Mrs. S. Bagley (Grimsby and Cleethorpes). Angels: 1, A. Piggott (Grimsby and Cleethorpes); 2, N. Andrews (Hull); 3, Mr. and Mrs. Kirk (S. Humberside). A.O.V. Cichlids: 1, Mr. and Mrs. R. Burman (Scunthorpe and Dist.); 2, Mr. and Mrs. Vernon (Retford); 3, Mrs. Brown (Immingham). Small Barbs: 1, W. and D. Jordan (S. Humberside); 2, Mr. and Mrs. Fletcher (Doncaster); 3, Mr. and Mrs. Tyson (S. Humberside). Large Barbs: 1 and 3, A. Cook (Retford); 2, M. Tripp (S. Humberside). Corydoras and Bothias: 1, Mr. and Mrs. P. Berry (Scunthorpe and Dist.); 2, S. Harrison (Grimsby and Cleethorpes); 3, Mr. and Mrs. Fletcher (Doncaster). A.O.V. Catfish: 1, Mr. Thorpe (Doncaster); 2, Mr. and Mrs. Morrissey (Immingham); 3, Mr. White (Scunthorpe and Dist.). Killfish: 1 and 3, G. Hoyland (Don Valley); 2, Mr. and Mrs. Tyson (S. Humberside). Small Anabantids: 1, A. Clayton (Immingham); 3, Mr. and Mrs. Golding (Immingham). Large Anabantids: 1, Mr. and Mrs. Berry (Scunthorpe and Dist.); 2, Mr. and Mrs. Feary (Doncaster); 3, Mr. and Mrs. Davenport (S. Humberside). Fighters: 1 and 3, R. Turner (Thorne); 2, W. Hunt (Thorne). Loaches and Bothias: 1, 2 and 3, Binns and Caldwell (Scunthorpe Museum). Sharks and Foxes: 1, T. Sanderson (Thorne); 2, Mrs. Campbell (Scunthorpe and Dist.); 3, Mr. and Mrs. Deury (S. Humberside). Rasboras: 1, Master S. White (Retford); 2 and 3, Mr. and Mrs. Lake (S. Humberside). Danios and Minnows: 1, A. Clayton (Immingham); 2, J. Hubbard (Boston); 3, Mr. and Mrs. Lake (S. Humberside). A.O.V. Tropical: 1, G. White (Scunthorpe and Dist.); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. and Mrs. Fletcher (Doncaster). Pairs Egg-layers: 1, Mr.

and Mrs. Lake (S. Humberside); 2, A. Clayton (Immingham); 3, Mr. and Mrs. Fletcher (Doncaster). Pairs Livebearers: 1, A. Clayton (Immingham); 2, D. Hill (S. Humberside); 3, G. Andrew (Hull). Livebearers Breeders (1-10): 1, Mr. and Mrs. Richardson (Scarborough); 2, B. Jackson (Doncaster); 3, A. Piggott (Grimsby and Cleethorpes). Livebearers Breeders (11-20): 1 and 3, B. Jackson (Doncaster); 2, K. Lancashire (Doncaster). Egg-layers Breeders (1-10): 1, B. Jackson (Doncaster); 2, Mr. and Mrs. Golding (Immingham); 3, Mr. and Mrs. Sellers (Lincoln). Egg-layers Breeders (11-20): 1, Master S. White (Retford); 2, B. Jackson (Doncaster); 3, P. Smith (Scunthorpe and Dist.). A.V. Marines: 1, L. Cox (S. Humberside); 2, S. Cant (S. Humberside); 3, Mrs. Bagley (Grimsby and Cleethorpes). A.V. Egg-layer (Junior): 1 and 2, Master S. White (Retford); 3, L. Cox (S. Humberside). A.V. Livebearer (Junior): 1, Master Feary (Doncaster); 2, N. F. Kershaw (Grimsby and Cleethorpes); 3, D. Hill (S. Humberside). Swordtail (Junior): 1, Miss Y. Newstead (Scunthorpe and Dist.); 2, T. Tidwell (Grimsby and Cleethorpes); 3, D. Alcock (Grimsby and Cleethorpes). Egg-layer (Single Female): 1, Master S. White (Retford); 2, A. Clayton (Immingham); 3, Mr. and Mrs. Fletcher (Doncaster). Livebearer (Single Female): 1, K. Lancashire (Doncaster); 2, A. Clayton (Immingham); 3, G. Hoodless (Scunthorpe and Dist.). Novice Egg-layer: 1, 2 and 3, M. Tidwell (Grimsby and Cleethorpes). Novice Livebearer: 1, Mr. Pitts (Independent); 2, V. Kershaw (Grimsby and Cleethorpes); 3, M. Tidwell (Grimsby and Cleethorpes). Fancy Goldfish: 1 and 3, G. Beetham (Independent); 2, K. Bell (Grimsby and Cleethorpes). Goldfish and Comets: 1, L. Cox (S. Humberside); 2, T. Sands (Boston); 3, T. Alcock (Grimsby and Cleethorpes). A.V. Coldwater: 1, W. and D. Jordan (S. Humberside); 2, Mr. and Mrs. Feary (Doncaster); 3, Mr. Stanley (S. Humberside). Best fish in Show: Gold Fish, Diplomas and Y.A.A.S. Pin went to Binns and Caldwell (Scunthorpe Museum).

**MEMBERS of the Hastings and St Leonards A.S.** enjoyed one of Ian Sellicks' talks on Cichlids, mostly the South American species at the first July meeting. Main event at the second meeting was a P.I.A.S. slide/tape programme "Beachcombing" by Cliff Harrison.

**RESULTS of the Oldham A.S. inter-club show held in July, were as follows:** Oldham A.S. 79 points; Wythenshawe A.S. 32 points; Hyde A.S. 24 points; Middleton A.S. 20 points. Best fish in show award went to T. and J. Selby of Wythenshawe. The **Oldham A.S.** meet alternate Mondays at 8 p.m. at the Ukrainian Club Waterloo St Oldham and everyone is welcome.

The fifth annual open show of the **Fancy Guppy Association** North West Lancs/Manchester section was held in June in Preston. The show was a great success and the many entries were judged by Mr. H. Vinnal from London. An auction of fish was held with trade stands and a pebbled raffle. The main prize in the annual draw—a portable radio—was won by ticket No. 3520, Mr. Campbell of Lancashire.

AT the first meeting at their new headquarters, the Three Nuts public house, members of the **Loughborough and District A.S.** were given a lecture and demonstration on fish photography by Phil Child. Slides of fish and general scenes from their annual show were also shown. The Society wish to thank Mr. Child for an interesting and informative evening.

**OPEN show results for Warrington A.S.** were as follows: Section A: Guppies: 1, B. Dawson (Heywood); 2, Mr. and Mrs. Muckle (Sandgrounders); 3, Mr. Wollbamer (Loyne). Mollys: 1, T. Redfern (Heywood); 2, T. Tinsley (Sandgrounders); 3, M. Baker (Warrington). Platies: 1, P. Squirrel (Wythenshawe); 2, Mr. and Mrs. Muckle (Sandgrounders); 3, Poulton Brothers (Southport). Swordtails: 1, R. Grant (Merseyside); 2, B. W. Carter (St. Helens); 3, Mr. and Mrs. Walker

(Wynntay). A.O.V. Livebearer: 1, T. and J. Selby (Wythenshawe); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, T. Hampton (Merseyside). Section B: Small Barbs: 1, Mr. and Mrs. Muckle (Sandgrounders); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, R. I. Payne (Merseyside). Large Barbs: 1, Mrs. Winstanly (Runcorn); 2, Mr. and Mrs. J. Taylor (Merseyside); 3, A. Vainiere (Merseyside). Section C: Small Characins: 1, Miss S. Goddard (Macclesfield); 2, C. Lambert (Warrington); 3, R. J. Stephens (Blackburn). Large Characins: 1, P. Ridley (Heywood); 2, R. D. Ankers (North Staffs); 3, Mr. and Mrs. R. Houghton (Southport). Section D: Small Cichlids: 1, T. Hampton (Merseyside); 2, W. Hillier (Warrington); 3, Poulton Brothers (Southport). Large Cichlids: 1, R. D. Ankers (North Staffs); 2, Mr. and Mrs. J. Taylor (Merseyside); 3, J. Feux. Rift Valley Cichlids: 1, Mr. and Mrs. R. Houghton (Southport); 2, Mr. and Mrs. Gough (Wynntay); 3, B. Feux (Merseyside). Angels: 1, Mr. and Mrs. Muckle (Sandgrounders); 2, Mr. and Mrs. Davies (Dunlop); 3, D. Wilson (Merseyside). Section E: Fighters: 1, T. E. Davies (Heywood); 2, B. Feux (Merseyside); 3, W. Frier (Leigh). Small Anabantids: 1, T. Brown (Warrington); 2, J. Hopkins (Merseyside); 3, Mr. and Mrs. Muckle (Sandgrounders). Large Anabantids: 1, Mr. and Mrs. A. H. Goddard (Macclesfield); 3, J. Waterworth (Leigh). Section F: Corydoras and Brochias: 1, D. Shaw (Dunlop); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, Mr. and Mrs. R. Houghton (Southport). Catfish: 1, P. Mully (Merseyside); 2, R. D. Ankers (North Staffs); 3, R. Ridyard (Leigh). Loaches: 1 and 2, Mr. and Mrs. Muckle (Sandgrounders); 3, Mr. and Mrs. Burpyne (Bridgewater). Labeos and Sharks: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, B. Maltby (Merseyside); 3, Mr. and Mrs. R. Houghton (Southport). Section G: Toothcarps: 1, K. Kryger (Wrexham); 2, J. Badley (Northwich); 3, R. J. Payne (Merseyside). Minnows and Danios: 1, Mr. and Mrs. Houghton (Southport); 2, J. North (Loyne); 3, P. Squirrel (Wythenshawe). Rasboras: 1, L. Thorne (Northwich); 2, R. J. Payne (Merseyside); 3, Mr. and Mrs. Muckle (Sandgrounders). A.O.V. Tropical: 1, R. Lamb (Southport); 2 and 3, Mr. and Mrs. Newton (Blackburn). Breeders (Livebearers): 1 and 2, Poulton Brothers (Southport); 3, T. Brown (Warrington). Breeders (Egg-layers): 1, A. Vainiere (Merseyside); 2, R. I. Payne (Merseyside); 3, B. Wilson (Merseyside). Breeders Egg-layers H: 1 and 2, A. Vainiere (Merseyside); 3, R. Barkley (Merseyside). Pairs (Egg-layers): 1, R. J. Stephens (Blackburn); 2, B. McCombe (Blackburn); 3, A. Vainiere (Merseyside). Pairs (Livebearers): 1, B. W. (St. Helens); 2, R. Grant (Merseyside); 3, L. Hampton (Merseyside). Common Goldfish: 1, Mr. Wolstenholme (Blackburn); 2, R. N. Dingley (Heywood); 3, Mr. and Mrs. Houghton (Southport). Fancy Goldfish: 1, M. and D. Valentine (Northwich); 2, Mr. and Mrs. Burpyne (Bridgewater); 3, H. Budeley (Northwich). A.O.V. Coldwater: 1 and 2, Mr. and Mrs. Harvey (Sandgrounders); 3, Mr. Wolstenholme (Blackburn). Junior Egg-layer: 1 and 2, J. Hopkins (Merseyside); 3, S. Maltby (Merseyside). Junior Livebearers: 1, Miss P. and S. Taylor (Merseyside); 2, B. Dawson (Warrington); 3, P. Iddon (Sandgrounders). A.V. Marine: 1, J. Midgley (Wythenshawe); 2, M. Baker (Warrington); 3, M. Vernon (Independent). Best in Show Award went to J. Midgley (Wythenshawe); and the competitor with most points prize was won by Mr. and Mrs. Muckle (Sandgrounders). The total number of entries was 557.

**SECRETARY CHANGES**  
**Portsmouth A.S.:** V. B. Hunt, "Caeleg", 120, London Road, Widley nr. Portsmouth, Hants. PO7 5EW.  
**British Discus Association:** L. Dunn, 52, Beech View Road, Kingsley, Warrington, Cheshire WA6 8DG.  
**Llantwit Major A.S.:** E. A. Hillman, 10, Leobine Close, Cowbridge, Glamorgan, S. Wales.  
**Warrington A.S.:** J. Higham, 42, Hood Lane, St. Sankey, Warrington, Cheshire. Tel: Warr. 36930.

Fancy Guppy Association North West Lancs/Manchester: Mrs. Joan Eloe, 8, Botanic Road, Churchtown, Southport, Merseyside PR9 7NG. Tel: 20074 Southport.

Catfish Association Great Britain: A. Haley, 19, Maclean Road, London SE23.

#### SHOW SECRETARY CHANGES

Sheaf Valley: B. Moore, 57, Nicholson Road, Sheffield S8 9SO.

Warrington A.S.: G. Millman, 101, Loushers Lane, Warrington, Cheshire. Tel: Warr. 36877.

#### VENUE CHANGE

Loughborough and District A.S. announce that the new venue for their meetings will be at the "Three Nuns" Public House, Church Gate, Loughborough (opposite Parish Church), on the second and fourth Thursday of each month at 7.30 p.m. Visitors and new members welcome. Please contact the Secretary, Mr. A. Onslow, 8 Garfield Road, Hugglescote, Leicestershire LE6 2HU. Tel: Coalville 31606.

#### AQUARIST CALENDAR

4th September: Yate & District A.S. 10th Open Show at the Y.M.C.A. (Whitfield School Rooms) Park Road, Kingswood, Bristol, Avon (Nr. Clock Tower). Schedules after 1st August from C. Stickland, 20 Buzage Close, Chipping Sodbury, Nr. Bristol.

5th September: Hoylake A.S. 7th Open Show at the Y.M.C.A., Hoylake, Wirral, Cheshire. Show Secretary, F. L. Sanders, 18, Drake Road, Leasowe Wirral, 051-630 1171.

5th September: Midland Koi Association Open Show at Budbrooke School, Hampton Magna, Nr. Warwick. Secretary: R. Hunter, 46, Olive Avenue, Wyken, Coventry. Tel: Coventry 617615.

5th September: Wellington & District A.S. Open Show at the Weavers Sports Centre, Weavers Road, Wellington. Further details and show schedules will soon be available from the Show Secretary A. J. Crew, 67 Swinburne Road, Wellington.

5th September: Bethnal Green Aquatic Society Open Show, at the Bethnal Green Institute, 229, Bethnal Green Road, E2. Schedules and further details available from the show secretary, R. Dale, 14, Rutland Road, Wanstead, London E11 2DY, tel: 01-989 9015.

5th September: The Killingworth Aquarist Association is to hold their second annual open show at Communicare, Killingworth. Schedules from W. Kidd, 75 Hartlands, Bedlington, Northumberland.

11th September: Kingston and District A.S. Open Show at Sutton Adult School, Benhill Avenue, Sutton. Benching, Friday 10th, 7 p.m.-10.30 p.m. Saturday, 7 a.m.-10.30 a.m. Anybody wishing to visit convention arrangements can be made regarding debenching.

12th September: Blackburn Aquarist Water-life Society, King Georges Hall, Northgate, Blackburn. Secretary, Mrs. S. A. Newton, 117 Richmond Terrace, Darwin, Lancs. BB3 0HG.

12th September: Barnley T.F.S. Annual Open Show at Mapplewell Staincross Village Hall, Darton, nr. Barnley. Schedules from A. Waddington, Show Secretary, 112 Racecommon Road, Barnley, Yorks S70 6AP.

12th September: Buxton and District A.S. Open Show at the Pavilion Gardens, Buxton. Details from J. Wells, 9 Byron St., Buxton, Derbyshire.

12th September: Cleveland A.S. Open Show to be held in the Hall, Hall Close, Ormesby. Details from B. Wellford, 50 West Road, Loftus, Saltburn, Cleveland.

12th September: Harlow A.S. open show. 12th September: Sunday—Midland Aquarist League, six class open show, Bulkington Parish Hall, Bulkington, Nr. Nuneaton. Details C. Chamberlain, 2 Stanley Court, Sydenham Drive, Leamington Spa. Tel: 28957.

15th September: Bristol A.S. Coldwater Open Show. Schedules from Show Secretary, E. N. Bowden, 12, Stoneleigh Walk, Bristol, 4. 775355. Postal entries close 31st August. Venue Bishopston Parish Hall.

19th September: Bassetlaw Fishkeepers A.S. First Open Show. Schedules from K. Clarke, 4, Big Lane, Claxborough, Retford, Notts.

19th September: Priory A.S. Tynemouth. Open-Show. Schedules later from W. J. Walton, 25, Rutherford St., High Howdon, Wallsend, Tyne & Wear NE28 0AW.

19th September: Wythenshawe and District A.S. Open Show at The Forum Hall, Civic Centre, Wythenshawe, Manchester. Tropical, Marine and Coldwater Sections. Show secretary, S. Barratt, 14 Piperhill Avenue, Northenden, Manchester M22 4DZ.

19th September: West Cumberland Aquarists' Club Open Show, The Civic Hall, Whitehaven, Cumbria.

19th September: Severnside Aquarist Association first Open Show at Stroud Subscription Rooms (not to be confused with Stroud and District A.S. Show to be held on 15th August). Details can be obtained from Denise Cole, Hon. Sec., Avignon, The Hill, Randwick Stroud, Glos.

25th September: Goldfish Society of Great Britain. Annual Open Show Sutton Adult School, Sutton, Surrey.

26th September: Mount Pleasant Open Show will be held at St. Joseph's Church Hall, Gateshead on Tyne. Show Secretary, T. Wilson, 31, Gorsehill, Beacon Lough East, Gateshead 9, Tyne and Wear, Tel: Lowfell 875525.

26th September: Northampton & District A.S. Open Show at the Sports Hall, Lings Forum, Weston Favell Centre, Wellingborough Road. Schedules being prepared.

26th September: Chesterfield and District A.S. Annual Open Show. Venue, Clay Cross Social Centre, Chesterfield Road, Clay Cross, nr. Chesterfield, Derbyshire. Exit 29 off M1. Follow signs four miles to show. The venue is on the A61. Further details from Show Secretary, C. Lee, 21 Farnsworth St., Hasland, Chesterfield, Derbys.

2nd October: East London Aquarist and Pondkeepers Association annual show breeders, to be held at Ripple Road School, Barking.

Entry forms can be obtained from Mr. J. London, 41 Maybank Avenue, Hornchurch, Essex.

2nd October: Goldfish Society of Great Britain, Open Show, to be held at Wimbledon Community, St. Georges Road, S.W.19. Schedules from G. E. Herring, 94 Penwith Road, S.W.18.

3rd October: Newbury & District A.S. Fourth Annual Open Show at the "Plaza," Market Place, Newbury. Schedules and full details from Mrs. S. Cannings, Show Secretary, 6 South End, Thatcham. Tel: Thatcham 64254.

3rd October: Eboracum Aquarists Open Show at Nunthorpe Grammar School, Scarcroft Road, York.

10th October: South Leeds A.S. Open Show to be held at Hunslet Boys Club, Hillside Road, Leeds 10. Benching 12 noon to 2 p.m. Schedules from Mr. A. Austwick, 151 Throstle Road, Middleton, Leeds 10. Tel: Leeds 703149.

10th October: A. A. Jones and Shipman A.P.S. First Open Show will be held at their Works Canteen, Watergate Lane, Leicester (1/2 mile from M1 Junction 21). Benching 11.00 a.m.-1.30 p.m. Schedules now available from Mr. M. Brambridge, 123 Martin Street, Leicester. Tel: Leicester 667319.

10th October: Hartlepool A.S. Open Show at Loncar Hall, Saxon Carew, Hartlepool. Further details from Mrs. A. Lion, 1, Loyalty Court, Hartlepool, Cleveland.

10th October: Immingham A.S. first annual show.

17th October: Torbay A.S. annual Open Show at Torbay Chalet Hotel, Marldon, Paignton. Schedules from Mr. J. R. Davis, 43, Haddon Road, Torquay, Devon.

17th October: Sunday—Midlands Aquarist League, six class open show, Bulkington Parish Hall, Bulkington, Nr. Nuneaton. Details C. Chamberlain, 2 Stanley Court, Sydenham Drive, Leamington Spa. Tel: 28957.

23-24th October: British Aquarists' Festival Silver Jubilee, Belle Vue, Manchester. Further details shortly. See display advertisement pages.

31st October: Doncaster & District A.S. Open Show. Benching 12 noon to 2 p.m. (Note change of venue) The Carcroft Miners Welfare Hall, Carcroft.

7th November: Halifax A.S. Open Show at The Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Details from D. Shields, Cobblestones, Gaiest, Kings Cross, Halifax. Phone Halifax 60116.

14th November: Bradford & District A.S. Open Show will be held at Textile Hall, Westgate, Bradford. Details from show secretary J. Cornforth, 15, Weymouth Avenue, Allerton, Bradford, W. Yorks.

20th November: Goldfish Society of Great Britain. General Meeting, 2 p.m., Conway Hall, Red Lion Square, London, W.C.1.

27th November: Fur, Feather and Aquarist Show, King's Hall, 39 Lower Clapton Road, London E.5. Schedules from Sybil Hedges, Koi Korner, 150 Ashburton Ave., Seven Kings, Ilford, Essex IG3 9EL. Tel: 01-590 3239.

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