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THE **AQUARIST**  
AND PONDKEEPER





# THE AQUARIST

AND PONDKEEPER

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**Our Cover**  
Common Goldfish  
(*Carassius auratus*)  
Courtesy of Derek Rutherford

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The Editor accepts no responsibility for views expressed by contributors.

# HOOKED ON IGUANAS

by Peggy Aldis

MY FIRST encounter with an Iguana came quite unexpectedly on a warm sunny afternoon. I was shopping in our busy high street, when suddenly I spotted this magnificent creature, perched on the shoulder of its owner, completely oblivious to the noise and people around him.

I think I was hooked from that moment, although quite a few months passed before doing anything about acquiring one. Every time I gave any thought to the matter, a picture of our very large cat came into my mind. He is a devious character being part Siamese. I felt a small timid Iguana would be no match for him. However, common sense in this case did not prevail, and one evening after work I found myself hurrying home from my local pet shop with my first Iguana in a white linen bag stuffed down my jumper. He was a pathetic specimen, about 8 in. long with only part of a tail, and a rather thin body. Probably, someone with experience in keeping reptiles would have left him where he was, but I was thrilled to bits, determined to do my best for him.

Three weeks later temptation got the better of me and I bought another, much smaller, but healthier, this time with a lovely long tail.

It seemed to me that a name should be the first thing, but as I have never had much imagination where names are concerned, "Simon" was the best I could come up with. The second Iguana fared even worse, he is still referred to as "the little one." What I lack in imagination, I certainly make up for in enthusiasm, for I grow daily more and more interested, my only sorrow being the lack of information available.

What to feed them on, and the necessary temperature is all I could find out. My knowledge to date has been acquired through trial and error, which does not seem to have done them any harm. "Simon," in four months, has doubled his size, and his tail is four inches longer, he is now eating almost everything offered,

even tinned cat food. "The little one" is more particular, and sometimes has to be coaxed.

## Housing the Iguanas

My husband is a keen aquarist and has a fish room of his own, so he does not have time to share my hobby. He is nevertheless always willing to help, and has proved invaluable in doing the many odd jobs which have been necessary. For instance, a kitchen cabinet with shelves removed and doors replaced with glass has made a fine home for the Iguanas. A 40-watt bulb installed in the top of the box is enough to maintain a daytime temperature of approximately 25°C. No heat was necessary during the summer months, but as the nights have now become colder, a small 15-watt bulb, shaded with a tin, keeps the temperature around 15°C.

The Iguanas were put into an empty room at the top of the house, the idea being that they could come out of their box and run around. Things went well for a while until Simon became plagued with that age-old emotion, jealousy. Whenever I attempted to make a fuss of the little one, Simon seemed to perform a kind of war dance, lifting his head high, and shaking it vigorously and at the same time, hissing. Once or twice he even tried to bite the little one, this came as a great surprise to me, as never once has he attempted to bite me—there must have been many times when I have provoked him to do so.

## Feeding Iguanas

My method for feeding Simon when I first had him is probably an example of the provocation I mentioned earlier. Anxious for him to grow stronger, I was continually offering him food. Fish, meat, fruit, anything in fact that I thought he would eat. Sometimes he would eat it, but mostly his eyes would close tightly and adopt a "get lost" expression. Having got the message, I now leave food for him to eat when he wishes, daily consisting of lettuce, nasturtium leaves or cabbage, the nasturtium leaves being the

favourite. Added to this, about 1-tin of cat food with a little vitamin powder mixed in. Twice a week, meal worms, and once a week, a few small garden worms folded into a nasturtium leaf for extra protein. The reason for adopting this method is obviously to fool him as he doesn't like them, and it works.

As previously mentioned, the little one does not eat so well, raw egg yolk is acceptable, also a little grated carrot. Fortunately he drinks well, and the vitamin powder is added to his water daily. Funnily enough, no matter what else is offered he only tastes it; it is as if there is something special that he is waiting for, but to date I have yet to discover it.

One thing that has proved very popular with my Iguanas is a very large tree branch in their room. The moment I let them out, they make a dash for it, climbing from branch to branch, returning to their

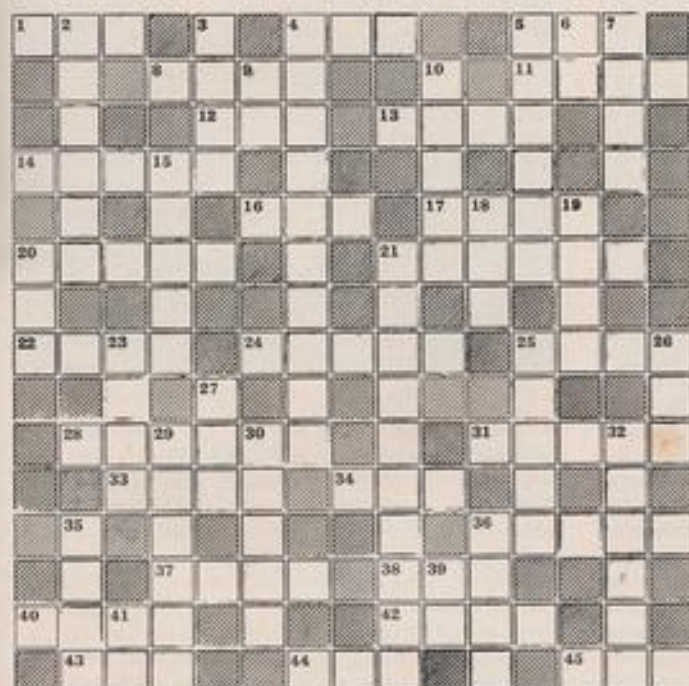
box only to sleep. Since giving them plenty of freedom they have become very tame, and will now climb right up on to my shoulder.

It would be impossible to count all the mistakes I have made, but a great deal has been learnt too. I have also made a few interesting observations, and now feel confident enough to add other species of reptile to my collection.

In conclusion, to those who are contemplating keeping an Iguana, may I say that in my humble experience, patience is all that is needed; remember that, like all wild creatures, they will at first be nervous and hide away. After a while, realising you are not such a bad sort after all, they will venture on to your hand, and eventually on to your shoulder. You will then know that their instinctive fear of humans, of you at least, no longer exists.

## The AQUARIST Crossword

Compiled by M. J. ELLICK



Solution on page 337

### ACROSS

- 1 and 22. *Branchioma tentaculatum* (3, 4).
4. and 3 Down. *Bodianus axillaris* (3, 4).
5. Single (3).
8. Regrettableness (4).
11. Outer garment (4).
12. Unhappy (3).
13. Close at hand (4).
14. Place for cricket (5).
16. Of the Gadiformes family (3).
17. Preach noisily (4).
20. Decoration for marine tanks (5).
21. See 26 Down.
22. See 1 Across.
24. Water vapour (5).
25. Restrain (4).
28. Poisonous metal that can cure (6).
31. Circus fish? (5).
33. Jumping Insect (4).
34. Terminate (3).
36. Basic food (5).
37. Betting office (4).
38. Under the weather (3).
40. Greek letter (4).
42. Does *Centropyge flavissimus* taste this? (4).
43. Crafty one (3).
44. Type of tree (3).
45. Home of *Flammula scythrops* (3).

### DOWN

2. One with no colour (6).
3. See 4 Across.
4. Instrument for measuring s.g. (10).
5. A score turns about for the sea (6).
6. Negative (2).
7. Obtain pay (4).
9. Small thanks (2).
10. See 29 Down.
15. A rabbit's foot is said to be one (5).
18. Measure of current (3).
19. Exam (4).
20. *Acanthostracion quadricornis* (- - - fish) (3).
21. Also called a turkey fish (6, 4).
23. Covering on home (4).
25. Of the heavens (5).
26. Cooking utensil (3).
27. Copy (3).
- 29 and 16. Does this fish rest upside down? (6, 5).
30. Fox's home (5).
32. *Hemigymnus fasciatus* (6).
35. Cook (4).
36. and 21. Across. *Pomacentrus coelestis* (4, 6).
39. *Lo tulpinus* (2).
41. In the direction of (2).

# BREEDING THE KEYHOLE CICHLID

Written & Illustrated by

Jorgan & Pamela Hansen

Our first encounter with the Keyhole Cichlid (*Aequidens maroni*) took place about 12 years ago in a little backstreet aquarium shop. In a filthy tank swam a yellow-brown fish with a curved black stripe down over the eye and a vague black spot in the centre of the body. It reminded one of a little kitten, as it had its own gentle way of moving about. There was only one specimen in the shop but nonetheless it was bought and transported home to a community tank. The dealer couldn't identify the fish and in the then available literature it was impossible to find an illustration of the fish.

However, the mouth was small and slightly protruded, and the lateral line was placed low, so it was possible to deduce that it belonged to the *Aequidens* genus, and only the description of *A. maroni* fitted reasonably well with the acquired fish.

During the next five years it was impossible to obtain other specimens of this species. But the experience with the one Keyhole Cichlid at that time was positive. The fish would not dream of doing harm to anyone: even a little neon fish just in front of its mouth did not need to fear being swallowed. The Keyhole Cichlid did not dig holes in the gravel nor touch the plants.

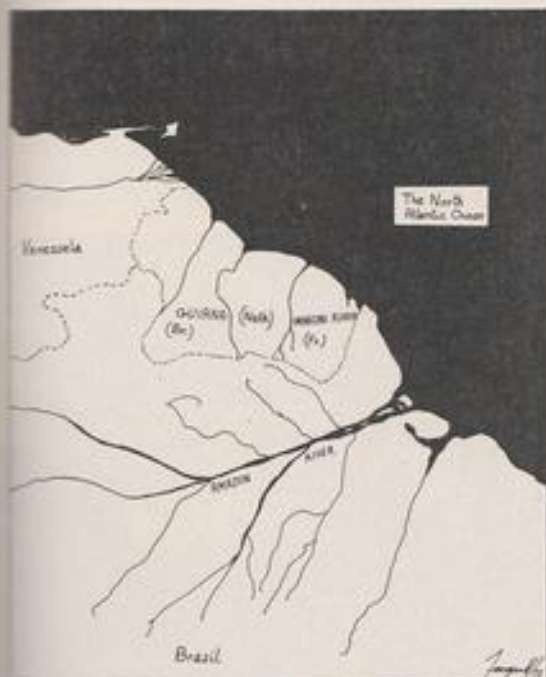
The Keyhole Cichlid comes from Venezuela and Guiana in South America, and is named after the river Maroni where it was first collected. As no calcium or other salts occur in the Guiana Highlands, which provides the water for the rivers in this area, the water has almost the same composition as rain, which falls frequently in these regions. Measurements given by G. S. Carter who took part in the Cambridge Expedition to British Guiana in 1933 show pH values from 5.8 to 6.45 and DH values from 0.29 to 0.41. Keyholes could thus justifiably be kept together with Discus as far as type of water is concerned.

During a trip to different aquarist shops in April, 1972, we saw a small flock of Keyhole Cichlids and bought four, measuring 5 cm. (7 in.) in length. When we reached home we placed them in an all-glass tank,



80×40×40 cm. (32×16×16 in.) containing six months' old water of a pH7 and DH12. The tank was built up with large stones and planted with *Echinodorus cordifolius*, *E. magdalenensis*, *E. brevipedicellatus*, *Microsorium pteropus*, *Vallisneria spiralis*, and *Cryptocoryne griffithii*. There were already seven marble angelfish and five Pearl Gourami in the tank. We fed the fish variably with *Cyclops* and *Daphnia* and sometimes with dry food. Then, or so we thought, we had to feed them up for at least six months before we could begin to think of breeding them. But less than two months later, late in the evening, we noticed that on one of the four a protruding breeding-tube was evident and a white edge had appeared along the

upper part of the dorsal and tail fin (some people say that this is a sign that the fish is mature and ready to spawn). This white edge was also visible in the fish which had paired off with the presumed female. As we did not think that anything would happen that evening, we refrained from moving away the other fish; next morning we saw to our surprise that about 50 eggs had been laid upon the largest stone in the tank, which lay underneath a large leaf of a sword plant. One of



the fish remained above the eggs and moved only when the other came to relieve it. We considered removing the eggs for artificial hatching but as a large amount of gravel and several plants would have been disturbed if the stone were removed, we decided to leave the eggs and eventually moved the rest of the tank's inhabitants away when they had hatched out.

On the morning of 26 May, 1972, the eggs were still there, with the parents just above them, but by the evening the eggs had disappeared. The parents seemed to be guarding something in one of the corners of the tank, but there were no signs of anything reminiscent of fish larvae, either that day or on the following days.

As we reckoned that the eggs or fish larvae had been eaten, and as we assumed that *A. maroni* would behave like most other cichlids and keep on spawning regularly until their instinct to propagate were satisfied, we moved all fish other than Keyholes out of the tank. The idea was to move the superfluous ones out as

soon as we could properly distinguish the pair again. However, after two months nothing had happened except that one of the Keyholes had died. We moved the original inhabitants of the tank back again. Later in the course of the winter another Keyhole died, so we were left with two fish, regarding whose sex we were completely ignorant.

In May, 1973, we acquired two large Keyholes. We put these and our two original fish into a tank by themselves—30 × 25 × 90 cm. (12 × 10 × 36 in.)—decorated with various stones, which presented opportunity for spawning on both horizontal and perpendicular surfaces. *Sagittaria* were planted behind the stones to the left and small *E. brevipedunculatus* to the right. When the fish had been together for a week it became clear that one of the original fish and one of the new fish had paired off. Now and then small fights occurred with the two other Keyholes who were chased to the farthest corner of the tank. We removed these two fish, but almost a month passed with nothing happening although the pair were fed daily with mosquito larvae, red *Daphnia* and *Cyclops*.

We were thus obliged to try something more drastic. As the water in those pools or streams where *A. maroni* lives in nature is very soft and acid, we decided to try to obtain such water for our fish. We knew from previous investigation that the water in a pond in a



nearby wood was of this type, so one Sunday we borrowed a car and fetched about 16 litres of this water. We exchanged about one-quarter of the aquarium water in the Keyhole tank with the soft water, which had a pH of 5 and DH of 3.5. The final pH value of the aquarium water was measured to be 6.5; the DH value was not measured. Three days after the change of water, 14th June, 1973, the female had a hint of a breeding-tube, while the male, who could now be distinguished by his more pointed breeding-tube, showed a more distinct protrusion. Most of the stones in the tank seemed to have been cleaned. On the following afternoon, 15th June, 1973, the female's breeding-tube appeared large, pink, and swollen. It was almost 4 mm. long and 2-3 mm. thick. In the course of the afternoon we looked in at the pair

regularly but observed no spawning, although both hovered near a flat stone, almost buried in gravel.

When we later looked more closely at the stone, we discovered that it was fact covered with about 200 2 mm. large, brownish eggs. The reason we didn't discover them earlier was because they were almost the same colour as the stone they were laid upon. Both male and female attended to the eggs. We noticed them push away a couple of approaching snails.

The stone with eggs was removed for artificial hatching of the eggs. For this purpose we took about 6 litres of water from the tank where the eggs were laid. The parents were presented with a new stone of similar colouring which was placed in the spot vacated by the stone with eggs; they stared at the new stone, understandably enough, in a disoriented fashion.

observe the completion of spawning, but were too late to photograph it. The new lot of eggs had been laid on the stone put down for them. Now and then some eggs fungused and were eaten by the parents, who took turns in guarding them and fanning water over them. We did not feed the fish during this period so as not to pollute the water.

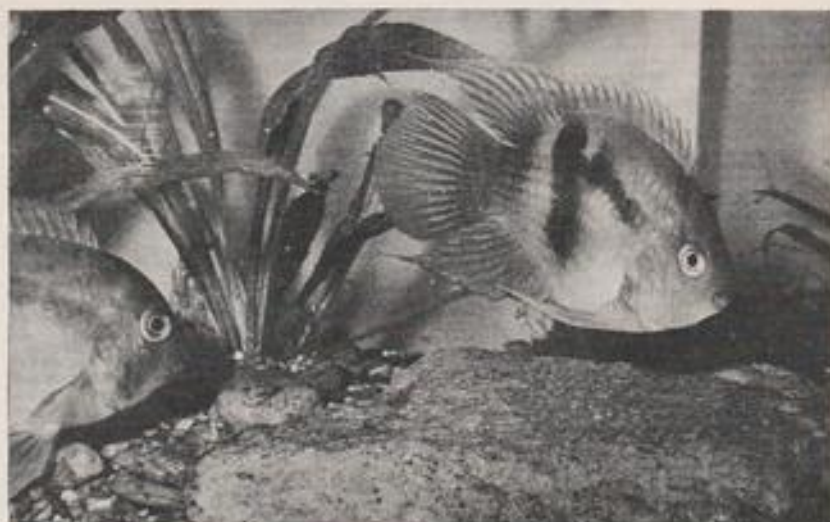
By the morning of 28th July, 1973, the eggs had hatched out but the larvae were still attached to the stone. In the afternoon the parents moved the young to a small hollow and in the course of the next eight hours the fry were moved at least four times, both parents helping with this, each taking several in the mouth at the time. This pattern of behaviour continued for the next few days.

The fry did not swim freely until 2nd August, 1973, and we then fed them with brine shrimp. In the

Right: Female guards eggs, male coming to help.

Page 330: Male with almost no black colouring.

Page 331: Male showing more distinct keyhole pattern but with no black eye-stripe.



16th June, 1973. Some eggs fungused and were removed with a pipette.

17th June, 1973. Almost two-thirds of the eggs fungused during the evening.

18th June, 1973. The eggs hatched out, and the larvae lay at the bottom, wriggling their tails. Only 10 remained as about 200 fungused altogether.

19th June, 1973. Eye pigmentation developed.

22nd June, 1973. The young, of which only five now remained, swam freely, and were fed brine shrimp. The young were camouflaged well with four to five dark stripes.

As the parents showed no signs of a new spawning, on 7th July, 1973, four litres of soft water was added to the tank.

On 21st July, 1973, we went away on holiday, nothing having happened until this date; when we returned on 25th July, 1973, we were just in time to

following weeks we witnessed a touching parental care. When the fry were fed, they were seldom allowed to venture more than a few centimetres away, but instead the food was frequently fetched over to them; or at other times the parents would disturb the dirt lying on the bottom, so that the fry could find nourishment amongst the disturbed particles. Towards evening the parents decided it was bedtime and the fry were packed tightly together at the bottom of a hollow with, usually, the male immediately above them. By the age of 1½ months, about 50 fry could be counted. They measured about 2 cm., e.g., ½ in., were speckled in coloration, with a stripe through the eye, and could eat *Daphnia*.

While guarding and caring for the young, the adult fish were observed to have the ability to vary their dark colouring and thus change to another pattern both on body and head in the course of a few minutes.



## 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.

## COLDWATER QUERIES

You sometimes refer to the weekly servicing of tanks. What is meant by this please?

I have often described this procedure in my articles, but realise that there are many new readers who may not have seen them. I expect I shall be accused of repeating myself but I am sure that the advice will be appreciated by others besides the enquirer. First of all, the front glass is cleaned on the inside to remove all the green *algae* or other matter. This can be done with a razor blade on a holder or by a small piece of plastic foam on a stick. Do not use blade on a plastic tank. Then place a bucket on the floor in front of the tank and use a siphon tube which has a length of half-inch glass tubing attached to a similar sized rubber tubing. The latter must reach to the bucket. Place the glass tube well down into the tank but not too near the base compost. Give a quick suck to the end of the rubber tubing and the water will start to flow. Move the glass end just clear of the compost and keep up a slight circular movement. This will raise the mulm which must be sucked up. Do not try to remove that which is on the back half of the tank as this will be for the benefit of the plants. If the tank is of a good size you may have to have a spare bucket as you may have to remove about a third of the water from the tank.

While the water is flowing it is necessary to keep a thumb and finger across the rubber tubing to give instant pressure if a fish gets too near or a water plant gets in the end of the tube. The water plants may now need pruning. If they have grown over too much of the surface of the water, some should be cut away. If they are shortened by half, the remainder will shoot out and become more branching soon afterwards. Throw away the water from the tank which was removed and refill with fresh. It can be done from a rose fitted water-can or the water can be poured on to a flat piece of board to prevent disturbing the base compost. Do not worry if the

by Arthur Boarder

fresh tap-water is colder than that in the tank, the fishes will appreciate it and it will do them no harm. Now clean the front of the glass and all should be neat and tidy. After a year or so with this treatment it may be necessary to put in a little more base compost as some may have been sucked up with the siphon. With this treatment it is possible to run a tank for very many years without having to completely empty it or replant. Should any plant fail it can be replaced when cleaning out the tank.

**I am building a pool, 16 ft. x 12 ft. x 2 ft. 6 in. I propose stocking it with the following fishes and would like your comments on their suitability please? They are: 10 mixed goldfish, comets and shubunkins; 4 rudd; 4 roach; 6 golden orfe; 4 carp (leather or mirror); 4 tench and 4 silver bream. Also how big will they be when adult?**

There are two species of fish which I do not recommend for your pond. They are the bream and the roach. The bream is a sluggish fish which spends much of its time at or near the bottom and as it has a very dark-coloured back it is not likely to be seen. As for the roach, this is rather a problem fish and many pondkeepers will not have this fish in their ponds as they complain that it is very liable to become infected with fungus disease. Although this is so I feel that the roach would be quite all right in a pond if care was taken with its introduction. If quite small ones were used I think that they would grow on quite safely and healthily. These fish have a very thick mucus or slime covering which is their protection against pests and diseases. If the fish is handled it is certain that much of this slime will be removed. Any angler will know that this is so, and few freshwater fishes will smother the hands with mucus when being taken from the hook more than a roach. I feel certain that it is when much



of this mucus is removed that the fish is prone to contract the dreaded disease. Therefore if you must have roach, make sure that you use young clean ones or be very careful when netting or handling them.

Actually there is no need to use roach at all as the rudd is a rather similar fish and does not seem to be as prone to fungus disease as the roach. You must realise that although your pond is of a good size, some of the fish can grow rather quickly and you might find that in three or four years you have overstocked. As for the relative sizes the fishes could reach, there is no worry with the goldfish varieties, they are not likely to get too large. The rudd can reach 4½ lb., the orfe can grow, and fairly quickly, to 18 inches long. Carp can vary as to species from 4½ to 44 lb.; the tench (golden is to be preferred to ordinary green), to 9 lb., but these weights are about the maximum taken from records and the fish are not likely to reach this size in your pond, excepting perhaps the orfe.

**I have a medium-sized Koi which has developed a small lump the size of a pea on one side of the vent. The fish appears to be quite healthy otherwise. Can you suggest a cure?**

It is probable that the small lump is a cyst. As long as it does not become inflamed there is nothing that you need do. It may remain the same size for some time but if it becomes very enlarged and inflamed it will need treatment. It may have a form of parasite in it or some pus. In such case the lump can be opened carefully and the contents pressed out. Sterilise a sharp pen-knife and open a small orifice. Wipe afterwards with neat T.C.P. or Dettol and do not return the fish to the pond until the wound has healed up. An occasional bath in a sea salt solution for an hour or two each day will help to heal the wound.

**Can you recommend a good small pump which will serve a few aerator stones for coldwater tanks?**

In the first place I do not think that it is necessary to use aerators in ordinary coldwater tanks. I have never used them in many years except for hatching and rearing tanks. If a tank is well planted and not overstocked it should function without artificial aeration. I have only used one make of vibrator pump in all my years of fishkeeping and so I am not in a position to say whether it is as good as or better than any other. I do not remember when I bought the one in present use but it is a Zoobeko junior and it has run continuously night and day for two years and a month since I changed the diaphragm, serving up to nine rearing tanks.

**I have kept golden orfe in my pond for five years, but while I was away on holiday two**

**have died. I cannot understand this as they have been so healthy all the time I have had them. I usually switch on a fountain during warm weather. Do you think the fish died because the fountain was not working while I was away?**

It is almost certain that the orfe died because the pond water got too warm and lost much of its oxygen. If the fountain could have been switched on during the hot weather the fish would have been all right. Orfe are essentially river fish and require plenty of oxygen. I have seen large orfe lying on their sides almost dead which recovered and fed within minutes of a hose being played on them. No one should attempt to keep orfe in a small pond which is exposed to the sun unless there is a fountain or waterfall to keep the water fresh during very hot or thundery weather. There has been so much sunshine in many parts of the country during the summer of 1973, that I suspect that many orfe have been lost if conditions were not right in the pond.

**I have a rather small pond in the garden with a water lily. The water has suddenly started to smell badly and an oily film has come on the surface. Why is this please?**

It sounds as if there is something decaying in the pond and it can be dead water lily leaves. These will give off the oily film when they are starting to decay. If you push such a leaf under the water you will see the oil spread over the surface. You had better remove all dying leaves from the lily and empty the pond. There may be something else decaying in the water, perhaps uneaten dried food. This may be causing the smell. Wash out the pond and refill with fresh water. If you fill the pond with a hose from a tap do not put any fishes back into the pond for a few hours as the water can upset the fish if it contains too much oxygen. The time lag also allows the effect of chlorine to escape into the atmosphere. I do not think that the amount in drinking water would kill fishes but it is better to be on the safe side. Also the water may warm up slightly with the exposure.

**I have a six-inch lionhead goldfish which has some small blobs of matter coming from its head. They soon pass away but after a time some more come. How can I cure this please?**

I have seen this happening with several adult lionheads and orandas and do not think that there is anything to worry over. It is not a disease and in my opinion it is an extrusion of mucus from the misformed cells on the excrescence which is called the hood. This is composed of a malformation of cells and corresponds to such a formation found on some plants especially some cacti when the formation is called a crest and the plant is referred to as a

crustate. The mucus is secreted in some of the cells on the head and as they are not formed correctly their function is interfered with and the white matter appears as a blob instead of as a film.

**I have a large pair of goldfish and the female is egg-bound. What can I do to cure it?**

Many female goldfish will carry their eggs over from one season to another if conditions are not right for a spawning. In such cases the fish may shed the eggs the following year if the correct purity of the water occurs. Such fish may have the eggs all ready to lay but will not do so until they are encouraged to expel them by chasing and worrying. The fish will come to no harm if left alone but if you would like to try stripping it you could take the chance. Hold the fish, belly uppermost, in the left hand and with the thumb and finger of the other hand, press gently from the front of the belly towards the vent. Do not exert too much pressure or you could injure the fish. I do not recommend that you do this as I feel sure that if left alone the fish will carry the roe over to another year.

**I have a number of goldfish in my pond and they have bred. There are a lot of youngsters which are still dark in colour. When will they change colour and will they live through the winter in the pond and if not what shall I do with them?**

Young goldfish change from their original greenish-bronze to gold according to the warmth of the water and the conditions under which they have been reared. With good conditions they should turn within a year but some never change at all. If there are already some goldfish in the pond which have not changed it is possible that many of the fry will not do so. If you wish to keep most of the fry you should take them under cover for the winter, and keep them in a tank, large enough for them to have plenty of swimming space. Unless the young ones are at least an inch body length they may not live through the winter outside, but a lot will depend on whether we get a severe one or not. If you winter the youngsters in a tank see that you allow an inch of body length of fish to each twenty-four square inches of surface area of water.

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## TROPICAL QUERIES

by Jack Hems

**What can you tell me about the alligator catfish?**

*Loricaria parva* is the scientific name of the alligator or whip-tail catfish. *L. parva* attains a length of about 4½ in. and is characterised by a tapering body and a singular elongation of the upper lobe of the caudal fin. Because this interesting species is a greenstuff eater, *algae* or a substitute for *algae* (cooked lettuce or spinach, for example) should be included in its diet. *L. parva* is native to Paraguay and should be kept in clean, well-aerated water. It has a fairly wide range of temperature: from the upper sixties to the eighties (°F).

**I started as a beginner in tropical aquarium keeping about a month ago but up to now I have not enjoyed much success. I keep finding fish dead or dying on the bottom and the plants are not making any progress. Where am I going wrong?**

It is not possible to say. Please bear in mind though that every species of fish purchased must be a good mixer. Quarrelsome fishes soon result in torn fins and sudden deaths. Then, see that all fishes introduced into the tank are about the same size. Next, make certain that the species chosen are not avid eaters of

plants. Plants, too, require adequate light. Keep metal objects (except stainless steel) and calcareous rocks out of the tank. Hard and alkaline conditions suit very few freshwater fish and metal salts are toxic. Books such as J. H. P. Brymer's *Guide to Tropical Fishkeeping* should be read.

**Is it true that well-washed small coal makes a good substitute for charcoal in a filter?**

Small pieces of coal may be used as a filter medium but it lacks the absorbent qualities of activated charcoal or aquarium carbon.

**Please name the basic requirements of mollies?**

A spacious aquarium, salty water, a temperature in the low to middle seventies (°F), a strong light and plenty of soft greenstuff in the diet.

**One of my zebra fish (*Brachydanio rerio*) keeps rolling about in small circles near the surface of the water. Can you give me any idea what is wrong with it?**

In all probability your zebra fish is displaying signs of old age. Fishes of the genus *Brachydanio* seldom

stay alive for more than two years and when their time draws near they go into a rapid decline. On the other hand, an abrupt change of temperature would almost certainly result in the behaviour described in your letter. Therefore, if you know that your fish is not old, remove it to very shallow water and keep it under observation for about a week. If it shows no improvement, then it would be best to put it out of its misery by dashing it on to an uncarpeted floor. Death will be instantaneous.

**What type of filter and air-pump would you recommend for a tank measuring 12 in. by 9 in. by 7 in.?**

It would be a waste of money and time to equip so small a tank with an air-pump and filter. All you require are about a dozen aerating plants such as *Elodea densa* or *Sagittaria subulata* rooted in well-washed sharp sand and no more than six or seven small fish up to about 2 in. in length. Provided you do not overfeed the fish and keep the bottom clean by means of a dip-tube, the water should stay wholesome for a very long time without a change.

**Please give me the scientific name and the requirements in captivity of the white piranha?**

The white piranha is known to science as *Serrasalminus rhombeus*. Its requirements are the same as for other piranhas, namely adequate swimming space, a temperature in the middle to upper seventies (°F) and the usual meaty foods. If you turn up the genus *Serrasalminus* in any fairly comprehensive aquarium book—or better still obtain a copy of Dr. G. S. Myers' *The Piranha Book*—you will find all the more detailed information you may need.

**I should be most grateful for any tips you can give me regarding the care of the red cichlids?**

I take it you mean *Hemichromis bimaculatus* from Africa and not *Cichlasoma erythraeum* from Central America? If you do mean *H. bimaculatus*, more usually called the jewel cichlid, then a pair should be given a 2 ft. or 3 ft. tank to themselves. For this species is very aggressive and is quite unsuited to an ordinary com-

munity tank. The tank should be furnished with well-washed sand on the bottom and some lumps of lime-free stone. Plants which root deeply may be used or floating plants such as *Riccia* or *Salvinia*. Live food is required, or meat. The regular range of temperature (for tropicals) should be maintained.

**I have been told by a fellow hobbyist that my habit of feeding bread to my tropicals is asking for trouble. Is this true?**

It depends on the quality of the bread. Wholemeal bread toasted to a brittle crispness, and then reduced to fine crumbs, makes a healthy addition to the diet of the larger fishes. Ordinary white bread, with chemical additives, would probably bring about internal disorders and is best kept out of the aquarium.

**I would like to introduce two small axolotls into my tropical aquarium. Will the extra warmth do them harm?**

The axolotl has a wide temperature range but the tropical aquarium is not the place for it. First, the axolotl will attain a length of about 9 in. Secondly, it has a wide mouth and can, and will, snap up swallowable livestock.

**Yesterday my female guppy dropped a fair number of fry most of which are at this moment swimming about with a folded or spiked caudal fin and several have sunk to, and died, on the bottom. Can you give me a reason for this?**

One reason could be unsuitable or fluctuating temperature. Another reason could be dirty water. Still another reason could be disturbance of the mother fish just before parturition.

**Will the pygmy sunfish (*Elassoma evergladei*) settle down and live for any length of time in a community tank?**

*E. evergladei* flourishes well in a thickly planted tank maintained at a temperature of about 72°F (22°C) to 75°F (24°C). The other species sharing its quarters should be mild-mannered and peaceful. Ordinarily the pygmy sunfish has a life-span of two or three years.

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## PRODUCT REVIEW

**Power Vacuum Cleaner**, manufactured by Gunther Eheim Ing., Germany, distributed by John Allan Aquarium Ltd., Eastern Way, Bury St. Edmunds, Suffolk IP32 7AB. Retail price £18.75, plus V.A.T.

I first saw this power vacuum cleaner being demonstrated at the Interzoo exhibition at Wiesbaden, Germany, in 1972 but due to some production

difficulties this unit has only just now become available in the U.K. It is simple yet effective, and I am surprised that it has taken so long to appear on the market. As with most other Eheim products in this country, this power vacuum cleaner is rather costly but will be of great help to the more serious hobbyists. It is solidly constructed and promises to be very reliable—

if the well-known filters and motors are anything to go by.

The whole unit consists of 20 easily replaceable parts; the main body is a suction tube and a pressure tube. A dirt-collecting filter-bag is secured to the pressure tube by means of a sewn-in rubber band. There are three different kinds of nozzles; a glass-cleaning nozzle, a star-shaped nozzle for cleaning the gravel and a flat nozzle for hard-to-reach places. Because of a special connector piece very few pieces of gravel were sucked into the filter-bag during my tests. None of these interfered with the proper working of the impeller, contrary to my experience with a battery-operated suction cleaner.

A 12-volt motor incorporating an on-off switch is housed on top of the suction tube. The unit is 25½ in. long and will operate in any aquarium with a depth of water up to 21 in. A marking on the suction tube indicates the depth below which it must not be operated. Eight feet of electrical lead should be long enough for most hobbyists. The current for the motor is supplied via a plug-in transformer. Unfortunately, this transformer is made to Continental standards—two round pins—and must be used with an electric shaver adaptor to fit a standard 13 amp socket.

I found that the power vacuum cleaner was very easy to operate and with the covers removed I was able to reach all parts of the tank. Though the cleaner has a more powerful suction than the air-operated type, few pieces of gravel found their way into the filter bag. The gravel is sucked up and swirled around in the nozzle; this cleans it and then it is allowed to fall back into the tank. I was surprised to see how much dirt was removed, first time of use, from what I thought was a well-maintained aquarium. During my tests various species of fish reacted very differently; Harlequin Rasbora showed a great spirit of adventure by swimming playfully into the gentle current the unit created, whereas the Discus and Angel Fish became very frightened, even when the motor was not humming. But they all soon learned to accept this part of their routine maintenance, and now they no longer take any notice.

After use the filter-bag is removed and cleaned under water. The power vacuum cleaner must at all times be stored in an upright position to keep water from leaking into the motor. When it becomes necessary to clean the unit the connector piece and pressure tube are removed from the suction tube and all parts become easily accessible. Each part of the power vacuum cleaner may be bought separately; the whole unit should prove a lifelong companion for any enthusiast. It comes with an instruction leaflet and reference numbers for ordering spare parts.

My main interest is the breeding and rearing of Discus in tanks free from plants and gravel. Hobbyists will know what a lot of dirt such tanks collect, especially

with young fry when heavy feeding of brine shrimps becomes necessary six to eight times a day; but with this power vacuum cleaner, the cleaning of the tank's glass bottom takes no more than a few minutes even though the glass-cleaning type nozzle is rather awkwardly angled for comfortable use on the tank bottom.

Finally, let me say again, though the power vacuum cleaner is rather expensive I believe it will become an essential piece of equipment for serious hobbyists, particularly those rearing the more "difficult" species of tropical fish, for which cleanliness is most important.

If I were asked to suggest improvements to this power vacuum cleaner I would ask for yet another type of nozzle—one that would clean the glass bottoms of gravel-free tanks.

E. SCHULZE.

### Crossword Solution

F	A	N	F	H	O	G	O	N	E
L	P	I	T	Y	T	C	O	A	T
B	S	A	D	H	E	R	E	R	
P	I	T	C	H	R	I	A	N	
N	H	C	O	D	R	A	N	T	
C	O	R	A	L	M	D	A	M	S
O	R	E	R	P	S				
W	O	R	M	S	T	E	A	M	S
O	A	E	G	O	A				
C	O	P	P	E	R	O	C	L	O
F	L	E	A	E	N	D	A	R	
C	A	R	F	B	R	E	A	D	
H	T	O	T	E	I	L	L	S	
B	E	T	A	H	S	O	U	R	S
F	O	X	A	S	H	E	S	E	A

#### PRICE RISE

It is regretted that the continuing rise in production costs makes it necessary to increase the price of the magazine to 23p and this will take effect beginning with the January issue, 1974. It is intended to continue with improvements to the quality and size of the magazine and these will become apparent during the course of the coming year.

#### JANUARY ISSUE

Due to staff holidays during the Christmas period, we regret that our next issue is unlikely to be on sale before the second week in January. Please excuse this unavoidable delay and meanwhile we wish to take this opportunity of wishing all our readers

A VERY MERRY CHRISTMAS AND  
HEALTH AND HAPPINESS IN 1974

# WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author



I WOULD LIKE to begin by wishing you every happiness for Christmas and the New Year, and by thanking sincerely all readers who sent me their opinions during 1973. Without your kind interest W.Y.O.? could not have continued as it has done. I look forward to receiving letters from both old and new correspondents in 1974, and the feature remains open to anyone—hobbyist, dealer, manufacturer or distributor.

The first of this month's letters comes from Mr. J. Davidson, of 16 Woodlands Crescent, Turriff, Aberdeenshire, AB5 7DD, in reply to a recent query by Mr. Gill concerning water lettuce—*Pistia stratiotes*. Mr. Davidson writes: "I used to have a plastic tank which had a condensation shield under the tank top. In it water lettuce grew to quite a large size. I disposed of the tank and started using a glass tank which does not have a condensation shield. As a result my water lettuce is like duckweed. The plant propagates by sending out shoots from the tips of the leaves and likes a lot of light." (The botanical name for the shoots which are emitted from the centre of water lettuce plants is stolons; the common blackberry bramble often produces stolons—stems which curve down and, when they touch the ground, form roots and new plants. Plants of water lettuce require strong light and high humidity for optimum growth in aquaria).

Mr. K. Clementson lives at 408 Manchester Road, Leigh, Lancs., and the following is part of his letter. "... Could you give me any idea as to the number of sources of supply of fishes to the British Isles? Are there a select few by law or literally hundreds? I ask this question because my area seems to be starved of any good breeding stock of a few varieties of fishes such as guppies and swordtails as well as lots of cichlids about which I have read but never seen. The thought in my mind is: are a lot of good fishes going through the same channels? I have noticed that several shops in my area have similar varieties and standards of fishes at the same time." (I'd be pleased to publish any relevant information which readers can supply.)

I was pleased to hear again from Mr. C. Horton, Nimrod Straat 62, Nijmegen, Holland. He writes: "I felt I had to write once more regarding opinions on commercial 'cures'. Since last writing I have been

troubled with fin-rot and fungus. I can now report a complete cure in only three days, using the recommended dosage of Myxosan—made by Piscian Ltd. This medication really does work and I can heartily recommend it. My fishes' fins are growing back to their original beauty. I hope this brief note helps bring notice to a really good cure."

My thanks to the Torbay Aquarist Society for sending me the latest edition of their magazine, *Toras Topics*. As usual it contains a variety of reports and interesting articles and advertisements. It's well worth reading—even if the edition in question does contain a fair number of typing errors.

David Ward is 14 years old and lives at 7 Bridge-water Gardens, Edgware, Middlesex, HA8 6AP. He offers the following tip: "To keep *tubifex* worms alive longer I have a bucket outside filled with water. The worms are put in a small bowl near the bucket and a siphon tube is set so that it runs into the bowl from the bucket. A clamp is put on the tubing so that the water comes out in drops, keeping the worms alive longer."

Mr. L. McCourt is the proprietor of City Pets, Low Friar Street, Newcastle upon Tyne, and he writes: "To reply through your column—which I regard as one of the most refreshing aquarium columns ever published in an aquatic journal—to Mr. A. C. Young's insult which I could not return even if I had heard of him, if he is a Registered Federation Judge would he please carry on judging in any part of the country he can as judges are few and far between. As past Secretary and Founder Member of International Catfish, in 1965 I was fortunate to see possibly the first *Sorubim* type Silurids of Northern S. America imported into the U.K. for they had been available to hobbyists in the U.S.A. prior to this. These catfish belong to the family Pimelodidae which contains the following twelve known genera: *Acentronichthys*, *Microglanis*, *Pimelodus*, *Pimelodella*, *Pseudopimelodus*, *Rhamdia*, *Heptapterus*, *Sorubim*, *Pseudoplatystoma*, *Goslinia*, *Typhlobagrus* and *Sorubichthys*, with some twenty-eight species which I shall not go into here.

"The erroneous use of common name terms with a family of which there is so little known can be very misleading. In this group, shovelnose, tiger cat, tiger shovelnose, tiger leaf fish, fig tree shovelnose and others have been used. Whichever of the Pimelodids

these names may have been used for, I have found none of these fish ordinary. To close I would point out that *Pseudoplatystoma fasciatum* is the Pintado catfish, the sacred catfish of the Umutina Indians. It's extremely rare and to my knowledge has never been imported into the U.K. The tiger striped shovel-nose is in fact *Sorranbimichthys planiceps*. I hope this has been of some assistance to Mr. A. C. Young."

I was pleased to receive another letter from Mr. L. Sandfield, whose home is at 25 Leighton Road, London, W13 9EL. You may have read his previous letter which I included in my October feature, and the use I made of the word 'zoological' which I queried by using a question mark. I'll let Mr. Sandfield take up the story: "Regarding the word 'zoological' which you rightly queried, I think you or I must be mistaken here for the word I wrote, or intended to write, was 'zoogleaf'. This refers, as you know, to the film of aerobic bacteria and zoophytes which do the work in a subgravel filter . . ." (My apologies, Mr. Sandfield. I was unable to read your writing of the word—although I would make it clear that the remainder of the letter was perfectly legible—and as I have never before come across the word *zoogleaf*, I made the error of thinking that the word you had written was 'zoological', although I knew that the sentence did not make sense. I am pleased to be able to correct the error—and pleased at having learned a new word.) In another part of his letter Mr. Sandfield writes: "I take an intense delight in the fact that although I have been an aquarist for twenty-six years I have never attempted, deliberately, to breed an egg-layer. Purely by chance I once achieved a glorious cross between rosy and black ruby barbs. I'll tell you about it one day." (I'd be delighted to hear about it, Mr. Sandfield.)

I've been having interesting experiences with a pair of adult angels over the past three weeks. The pair of angels, together with a third adult angel and a variety of other fishes, share a 30 in. x 15 in. x 15 in. tank which, three weeks ago, was so crowded with plants that it was almost impossible to see the fishes—and surface plants were almost preventing light from reaching the lower regions of the tank. I cleared out a bucketful of plants to enable me to see the fishes; the extra light reaching the fishes caused two of the angels to pair up and spawn on the leaf of a large Amazon sword plant. They carefully guarded their eggs for two days, and then ate them. They spawned again a few days later, on a different leaf, and again ate their fertile eggs. About a week later a third leaf was chosen and a third spawning took place. The leaf chosen on this occasion bent across about half-way up the tank, providing an almost horizontal spawning surface. The parents carefully guarded and fanned the eggs, removing the few that developed fungus. When the fry emerged from the eggs small numbers

of them managed to wriggle over the edge of the leaf; this caused them to drop down in the water. The eager parents grabbed such youngsters, giving the impression that they were eating them; however, each youngster was carried back to the spawning leaf and violently blown back on to the leaf. Unfortunately, the violent 'blowing' of the parents was such that each 'blow' caused large numbers of other fry to be swished off the leaf into the water. This resulted in the parents having to make wild dashes round the leaf to catch the dropping fry. When 'blown' back on to the leaf further showers of fry set sail through the water. The sight was rather amusing and rather sad. The parents eventually became so distracted that the fry were all eaten. A look into the tank ten minutes ago showed that, for the fourth time in three weeks, the same adult angels have chosen a fourth Amazon sword leaf—a vertical one this time—and have covered it with eggs. Unless they have learned something from their previous experiences I can see even greater problems ahead for



them. Unfortunately, with my final exams looming ahead next week, and with this feature to complete, I just don't have the time—or the tank space—to hatch and raise the fry away from their parents. Perhaps, if the frequency of spawning continues, I may have time to attempt to save the next batch. It's all part of the exciting game of keeping fishes—although, like Mr. Sandfield, I seldom attempt to breed fishes now: if any decide to breed I usually allow them to get on with it without assistance from me; if they don't decide to breed I'm not disappointed.

I was pleased recently to see young Douglas Rose's discus article appear in *The Aquarist*; it began as a rather long letter for W.Y.O.? and I told Douglas that it could well be the basis for an interesting article. Having read the resulting article, I was pleased that Douglas took my advice. I recently read Douglas's latest article—on marines—and look forward to seeing if it too will reach the pages of our magazine. Douglas who is 17 years old, lives at 18 Abbey Lodge, Regent's Park, London, NW8 7RJ, and in a recent letter he

asked me a couple of questions. I'm sure Douglas won't mind if I ask readers the same questions as I won't have time to answer his letter until after my exams. The questions are: Do you think that shoals of fish are more attractive than community aquaria? What have you found has been the best size for a tank? My answers would be: (a) Both types of aquaria have their attractions; each type of tank, if suitably decorated and planted, can be equally attractive; depends upon the individual's subjective opinion in any given specific set of circumstances. (b) The size of tank which one would use would depend upon the use to which it would be put. For a small decorative or general breeding tank I would use an 18 in. x 10 in. x 10 in. size; for a larger community tank I would prefer a 30 in. x 15 in. x 15 in. size; however, it depends upon the individual's needs and opinions. What are your opinions on these topics? I would like to hear from you.

In the July edition I published a letter about 'Fred', Mrs. H. Allen's tame Koi. Mrs. Allen, as you may remember, is the General Secretary of The British



Koi-Keepers' Society, and her address is 1 Anthony Close, Peterborough, PE1 3XU. In her latest letter she informs me that 'Fred' is still "going strong and is very happy with the other thirty Koi" in Mrs. Allen's 5,000-gallon pond, complete with undergravel filtration—home-made from  $\frac{1}{4}$  in. overflow pipe—and a Japanese water-changing system. Mrs. Allen also sent me two copies of The British Koi-Keepers' Society's Newsletters—and they provide me with some interesting reading. Mrs. Allen has asked me to inform readers that the Society's present subscription rates are: £1.50—Member; £1.75—Member and Wife; 50p.—Juniors; all per annum, with no half-yearly subscriptions as everyone receives all the Newsletters for the whole year.

Mr. P. Croft's letter, from Preston Montford Field Centre, Montford Bridge, Shrewsbury, SY4 1DX, reached me some months ago, but the following paragraph makes interesting reading. Mr. Croft writes: "One subject that I thought might interest readers was the efficiency of scavengers. I have had

several fish in the hope of getting good scavengers but most have disappointed. The *Corydoras paleatus* try hard but don't really eat enough to have much effect on a big tank—not two of them anyway. Red-tailed black sharks eat algae but don't make good scavengers and the red-finned shark is only a little better. The black sharks however mop up unbelievable quantities of food, faeces and dead fish. Their only disadvantage is immense growth, making them unsuitable for a smaller tank than a three footer; and their aggressiveness is also a problem—although I don't find them too aggressive. If any reader has been looking for a good scavenger this could be the answer."

60 Arundel Road, Hollywood, Birmingham, B14 5UD, is the address of Mr. R. Dickens, who writes "I was finally induced to write to your pages when I saw Mrs. Donovan's letter in the September issue. I'm pleased to hear that I'm not the only sunfish fan in the country. I have a 2 ft. tank containing the two smaller species—the black-banded sunfish *Mesogomistus chaetodon* and the blue-spotted sunfish *Enneacanthus obesus*. These I have successfully bred though I have had no joy yet with the larger species in a 3 ft. tank. These are pumkinseed sunfish (*Lepomis gibbosus*), long-eared sunfish (*Leomis megalotis*), *Ambloplites rupestris* and the peacock-eyed bass (*Centrarchus macropterus*). I have never succeeded in feeding any species with dried food. The peacock-eyes were only  $\frac{1}{4}$  in. long when first acquired, and they would only eat *Daphnia*—although *tubifex* were taken grudgingly. Since a bag of *Daphnia* per day among four fish was rather expensive, after trying several other foods I finally hit on prawns—and now all my fish eat prawns greedily. Peacock-eyes even jump up to my fingers to take a piece of prawn. The fish are now  $3\frac{1}{2}$  in. long and I am looking for a bigger tank! I do not normally use filters in my tanks (I have a power filter standing by) since they stay crystal clear. I use a mixture of silver sand and gravel as sunfish prefer a sandy bottom and hardish water. On the whole I find sunfish are very interesting and intelligent fish if one doesn't mind live foods.

"I also find (as Sterba says) that it improves the colours of sunfish if they are hibernated in winter—although it might be considered a bind to set up a tank specially in an outdoor shed; but by reducing the temperature in stages I have kept black-banded sunfish (initially sold as tropicals!) as low as 36°F for a month. This resulted in an improvement in vitality and colour. Conversely, in summer the same fish have been kept at up to 80°F with just an airstone for 'comfort.' Unlike Cichlids, Centrarchids do not dig up plants, except possibly when 'nesting'; in fact, the shy species prefer thick planting. Finally, if anybody has any other species of sunfish I would be glad to hear from them. Many thanks Brian for an interesting column." (Thank you for an interesting letter

Mr. Dickens—even though my name isn't Brian.)

Mr. G. Hann's letter is headed: Corner Bungalow, Havelock Road, Warsash, Southampton, SO3 6FS. Mr. Hann begins by saying: "I find that a sponge with an abrasive backing is the most satisfactory *algae* remover for my tanks. I prefer the Sentenal brand with a cream abrasive face—as opposed to the green one. I have been 'sold' on undergravel filters for some months because the filtration area is so much greater and it seems to me that most of them are operated by air pumps which displace water from underneath the filter. As I have a small pond in my sun-lounge, as well as tropical tanks, I was prompted to experiment with rotary pumps to replace air pumps. As far as the pond is concerned, I use an Algarde filter and connect the airlift to the intake of a Lotus filter, thus providing a flow of about 100 gallons per hour for the small pond. I get clear water, and if *algae* form on the sides I wipe them off and the pond still remains clean. If, as some writers suggest, activated charcoal or other media are desirable, these can be introduced under the outflow of the pump, before the water is returned to the pond, and without constant changing of the filter bed. . . . When it came to using this principle for a tropical tank, I found that I was able to connect the input of a rotary pump to the airlift of an Algarde undergravel filter, and then return the clean water to the tank. With this rate of filtration I was able to clear a nearly putrified tank in a couple of days." Mr. Hann continues: "My rotary pump just sat conveniently on top of the airlift and the only disadvantage was that I could not put the normal hood on the tank. I should mention that the rotary pump may need priming with water if the airlift is away from the intake of the pump. This is usual in most cases, but the problem is not beyond the ingenuity of people used to mucking about with water." He concludes: "I have not read of anyone else using rotary pumps with undergravel filters and would welcome news of the experiences of other readers. Perhaps time may prove that I have done something stupid, but at this stage it seems to work."

Pencilfish are the subject of Mr. S. Ball's letter which reached me from 41 Effinch Lane, Barton-on-Needwood, Nr. Burton-on-Trent, Staffs. Mr. Ball writes: "Although I have kept tropical fishes for a number of years, I have spawned pencilfish on only one occasion three years ago. I purchased a pair of golden pencilfish—*Nannostomus beckfordi beckfordi*—on a Saturday afternoon, and on examining the female against a strong light noticed rows of eggs inside her. I decided to try to breed the fish. On the Monday evening I placed the pair in a 12 in. x 8 in. x 8 in. plastic tank containing 6 in. of prepared water—temperature 78°F, pH 6.8-7.0—with a thin layer of peat moss on the bottom, together with one or two nylon mops standing over an unravelled pot scourer.

The fish spawned in the middle of the following morning and after about half an hour I heard a pronounced tapping noise coming from the tank. This was caused by the female which had become entangled in the pot-scourer and was hitting the tank in her attempts to escape. After helping to release her—which necessitated the use of both hands—I was amazed to see the pair carry on spawning after a short pause. About fifty eggs were laid, most of which were fertile, and about 35 fry were raised to maturity using *infusoria*, brine shrimp and microworms, followed by various small and live foods. I have never used a pot scourer since then!"

(Photograph 1 shows the dwarf pencilfish, *Nannostomus marginatus*. I would be pleased to receive details from anyone who has bred this species.)

The fourth batch of angelfish eggs, mentioned earlier in this month's feature, have been progressing. The parents have now removed the babies from their egg 'cases' and have deposited them on one of the Amazon sword leaves which they used for a previous spawning. The young fry can be seen as a wriggling mass and this time the majority seem to have managed to stay attached to the leaf. The odd one that falls is 'blown' back on to the leaf by a parent—without, this time, sending those already on the leaf off on a trip through the water. To assist the parents with the care of their hatching babies, I left a 15 watt bulb burning over their tank last night. It seems to have helped the parents with their difficult task during the night hours. I'm looking forward to seeing a pit being dug—if events reach that stage. I'll let you know what evolves in a future edition.

Photograph 2 shows the climbing perch. I'd be pleased to hear of your experiences with this species. I find it an interesting and noisy fish—but also rather ugly and messy. What is your opinion?

Mr. C. Fowler lives at 946 Kingstanding Road, Birmingham, 22c, and he writes: "I'm after a female paradise fish, *Macropodus concolor*." (I wonder if Mr. Fowler doesn't mean *Macropodus opercularis*?) "and it's just impossible to get one in this part of the Midlands. Can you please help me?" I'm afraid I can't, Mr. Fowler. Any reader able to help should contact Mr. Fowler direct. His telephone number is 021-353 8309). Mr. Fowler offers the following as his 'tip' for the competition which I announced in the October edition. "I wish that *The Aquarist* operated a free 'exchange column' as there must be a lot of fellow aquarists like me who would benefit from this: people who would be willing to exchange fishes to, say, improve their stock with new blood." Mr. Fowler concludes his letter thus: "Have you ever heard, as I was told today, that white worm breeding is considered harmful to health? It has to do with the breathing in of spores. It's frightening if true!"

Continued on page 350





## B.A.F., 1973

By Jack Hems

THE 22ND BRITISH AQUARISTS' FESTIVAL, organised by the Federation of Northern Aquarists Societies in collaboration with *The Aquarist and Pondkeeper*, was held on 13th and 14th October, 1973, at Belle Vue, Manchester. Thousands of visitors, including a goodly number from overseas, filled the spacious Exhibition Hall on both days.

Among the major attractions were the competing societies' stands. There were thirty-seven all told. Seemingly no amount of hard work or technical skill is accounted too great by the participants if only their stands can be made eye stoppers. Naturally, some of the stands may not have been to all tastes, but the differences between them added spice to the scene and all invited close attention.

The first prize went to Edinburgh A.S., with a brilliantly conceived and executed representation of the historic castle perched high upon its rock. The tiny moving figures that gave life to the construction were decorative and vivid. As third prize went to Lanark-

shire A.S. for their well-designed model of a cake, I can well imagine the Great M'Gonagall, were he alive today, writing a better poetic commentary on this twofold success for bonny Scotland than he did for quite a few of the sights and events that fired his mind: Bailie Gibson's fish shop in *The Ancient Town of Leith*, for example. Triumphantly he might have penned:

"As aquarists the Scots  
Will travel far  
To take the prized awards  
And rush them home in diesel train or car."

Bury A.S. received second prize with their model of a camera. The story of Hansel and Gretel by the brothers Grimm inspired Village A.S. to erect a gingerbread house, with the wicked witch in the foreground. For this charming entry Village A.S. received fourth prize.

Continued on page 344

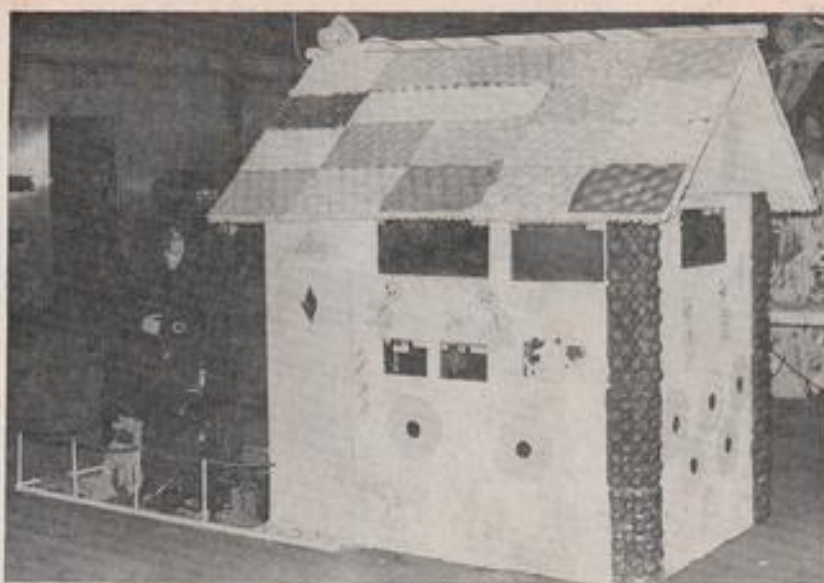


*Above and Right:*  
Mr. George W. Cooke  
presenting some  
of the major awards.



*Below:* Lanarkshire A.S's Stand.





Gingerbread House by Village A.S.

The wide variety of fishes entered for the Champion of Champions contest attracted visitors like steel needles to a magnet. Indeed, the few times I succeeded in pushing myself to within a few feet of the huge array of tanks, my view of the exhibits was interfered with, or completely obliterated by a sea of bobbing heads. The giant pacu (*Colossoma* sp.) deservedly received plenty of attention. A hydrocephalous (? species) cichlid won my heart. It looked so friendly when it came close up to the polished glass. A well-grown *Serrasalmus nattereri* gazed sullenly into space. The largest *Anoptichthys jordani* I have seen for many a day swam blind-eyed up and down its tank. The judges, however, never influenced by size and appearance alone, passed over these and scores of other species and gave top award to a *Tilapia melanopleura*. Second prize went to a *Danioides microlepis* and third prize to a *Cichlasoma severum*. The fish that received the award for Best in Show went to a well-grown *Mastacembelus armatus*, popularly known as the tyre track eel.

It is of interest to note that David L. Shields, a founder member of Halifax A.S., took first prize in Coldwater Individual and first prize in Tropical Individual. I say of interest because David won a first at Belle Vue (as a junior exhibitor) in 1953. There's more to come though. For this year's show, David Shields set up the tanks for Coldwater and for Tropical Furnished for which Halifax A.S. was awarded first prize.

Of the specialist societies represented, officers of The Goldfish Society of Great Britain, The British Koi Keepers Society, The Fancy Guppy Association, The British Killifish Association and the British Marine Aquarists Association were present to furnish sound and helpful information about their own particular branches of the fishkeeping hobby. The trade was well to the fore, as indeed it should be for the personal contacts and financial rewards this stupendous annual show (believed to be the best in Europe) offers to those who have the good sense and business acumen to take advantage of it, and there was a fascinating display of equipment, foods, water plants, tanks and fishes, freshwater and marine: all for sale. Some at genuine bargain prices, too.

Freshwater tropicals dominated the dealers' and competitors' display tanks, but fine quality coldwater species were not difficult to find. I noticed a splendid common tench, some well-shaped gudgeon, lively sticklebacks and golden orfe among the competitors' entries. Many of the goldfish, fancy and common, entered for an award were of high standard and brilliant hue. Marine fishes made a bold splash of colour. Not a few dealers had brought along some superb specimens from tropical seas.

The awards were presented by Mr. George W. Cooke, President of the F.N.A.S., and to Mr. Cooke and all those dedicated men and women who helped to make this year's show such a signal success our thanks are due.



#### A Disappointed Cichlid Fan

I have been a very keen aquarist for eight years. Having favoured various species of fish at different times, I have now settled down to a serious study of dwarf cichlids.

I am a member of our local society, Wednesbury and District A.S.; it is a very good club with two or three very experienced members who have their own specialities which do not include cichlids.

I have read of the British Cichlid Association through their publicity in your magazine. As I have received and kept every *Aquarist* since June, 1965, I had no difficulty in finding the information I required.

It was in the January 1973 issue I found the new secretary's name and address. Hastily I sent a letter including a S.A.E. asking for some information on becoming a member. Alas, after four weeks I had not received a reply.

I decided to search through my *Aquarists* again and found an item in the April 1972 edition written by Mr. Jim Burtles of Burgess Hill, Sussex.

Putting pen to paper, again including a S.A.E., I sent for an entry form and information. Again, after four weeks I have yet to receive any reply.

Realising that perhaps Mr. Jim Burtles and Mr. L. C. Alchin are not still officers of B.C.A., surely one of them could have replied to my letter without any expense to themselves?

On the other hand, if one or both of them are still active members and read my letter, they are not doing their job very well.

J. REEVES,  
36 Peter Street,  
Hill Top,  
West Bromwich,  
Staffs.

#### Piscatorial Geography

I wonder if you can possibly assist me by putting in your paper a paragraph about an item in my possession which I am prepared to give to any *bona fide* Aquarium Society or similar body, providing the recipient arranges transport.

The item in question is a wall box with a map of the world showing the habitats of tropical fish, which light up when the appropriate button is pressed. The box is 5 ft. 6 in. long, 4 ft. deep, and stands out from the wall to a depth of 7 in.

It is well constructed, being made many years ago by a professional carpenter for the now defunct Chelsea Aquarium Society.

I have to dispose of this object, but am most reluctant to simply scrap it, when perhaps some society could use it as wall decor or for exhibition purposes.

If you can help in any way I should be extremely grateful.

Yours truly,  
ERNEST BIGGIN,  
Secretary/Warden,  
The Community Centre,  
385 King's Road,  
London, SW10 0LR.

#### Thanks

I would like to take this opportunity to thank all the kind friends who wished me well during my recent stay in hospital. Also especial thanks to all those who signed the "Get Well" card at Belle Vue. I was sorry to have missed the show but it is nice to know that I was not forgotten. So many old friends have sent good wishes that I cannot reply to all individually but my thoughts are of them all just the same.

Yours faithfully,  
ARTHUR BOARDER.

#### Inter-Club League

As the newly elected chairman of Grantham and District A.S. I would like to bring to the attention of clubs in Lincolnshire and the East Midlands area our desire to form an inter-club league.

Would secretaries of those clubs interested in joining us in this venture please contact me in the first instance.

P. HARRIS,  
27 Clyde Court,  
Grantham,  
Lincolnshire.

#### Turtle Treatment

I am most anxious to contact any turtle owners in London as I have two of my own and would like to compare notes about feeding, accommodation, etc. If you can find a small space sometime in your magazine to mention this I should be most grateful. I appreciate that your publication deals with fish but there are no turtle societies or magazines in England and I notice that in recent editions you have, in fact, mentioned reptiles under "Junior Aquarist."

Yours faithfully,  
MARGARET COULTRIP,  
25 Littlewood,  
Lewisham,  
London, S.E.13.

### What? No Dealers?

Many years ago, on my first visit to the Aquarists' Festival at Belle Vue, Manchester, this show represented the best in fishkeeping. It consisted of an excellent show with a few trade stands. In 1972 I returned to the Festival after five years' absence to find almost half the hall taken by trade stands and the show itself seemingly relegated to second place. This year I returned, believing that the situation could only improve, only to find that now there are even more trade stands and the show pushed even farther to the back of the hall.

I was also disturbed that such a worthwhile competition as the Champion of Champions, run by *The Aquarist*, consisted not only of truly exceptional fish, but also such fish as an extremely small Topsword Guppy and a four-inch Red Piranha. These fish, according to the rules, apparently have achieved "Best Fish in Show" at an open show, and if this is the case, then the standard at the shows must have been really pathetic, or the judges must have known very little about fish.

It seems a great pity that such a great show and excellent competition should be allowed to deteriorate to such an extent.

Next year, how about a fish show, not a dealers' paradise?

Yours faithfully,  
D. RENTON,  
F.B.A.S. Judge,  
128 Dunstan Tower,  
Garth 18,  
Killingworth,  
Newcastle upon Tyne

### Patience for Perfection

As Secretary of the Newcastle Guppy & Livebearer Society, I feel I must reply to the comments made by Mr. Sandfield and Mrs. Deacon in your column. In my opinion, Guppies and other Livebearers are the most difficult fish to breed successfully.

To Mr. Sandfield I say "patience" in regard to breeding good-quality Guppies. Everyone knows that because the Guppy is "man made" it is never possible to predict that every youngster will be a carbon copy of its parents, as with egglayers. However, by selective culling and breeding it is possible to obtain a high percentage of fry with the desired colour, tail shape, etc.

One of the biggest difficulties faced by aquarists wanting to do this is the fact that most dealers tend to keep many different strains of male and female Guppies together in one tank, which leads to cross-fertilisation of females, making the desired results even harder to obtain. To get really good results, virgin females should be used at all times.

Regarding the poor quality of livebearers mentioned by Mrs. Deacon, I would agree with her, but I must

point out that most livebearers are imported and the dealers have virtually no control over what they get; however, members of this Society are doing their best to improve things in this area by selective breeding and culling and making sure that any surplus stock sold to dealers is of good quality.

If Mrs. Deacon would like any information about Livebearers I will be very pleased to help if she cares to contact me.

MRS. JUNE RENTON,  
Hon. Secretary,  
Newcastle Guppy & Live-  
bearer Society,  
128 Dunstan Tower,  
Garth 18, Killingworth,  
Newcastle upon Tyne.



### Surprise Holiday for Arthur—

WHEN Arthur Spencer of S.O. Aquatics, Atherstone, went to the opening of R. J. Cook's magnificent new wholesale warehouse he didn't expect to win the holiday for two offered by Interpet.

To qualify for a draw for the holiday, he had to order at least five Interpet products at R. J. Cook's opening.

The holiday offered by Interpet was for Arthur and his wife Margaret, but R. J. Cooks have donated another ticket for the Spencers' son, Lloyd.

Arthur, who is a vice-president of the G.K.N. Club and president of Atherstone Club, said: "I've been in business for five years and R. J. Cooks have helped us get going far more than ever I could have expected them to. And I've always recommended lots of Interpet products, so it was easy to place the necessary order."

The photograph shows: Mr. Ron Cook, founder of R. J. Cook (Wholesale Aquatic Supplies); Mr. Alan Evans of Cooks; Dr. Neville Carrington, Managing Director of Interpet; Mr. Arthur and Margaret Spencer of S.O. Aquatics, 51 Station Street, Atherstone.

# FROM NOVICE TO EXPERT

by Eberhard Shulze

WHEN I first became interested in the Discus fish I read everything published on the subject, but instead of finding encouragement I came to feel disheartened. Every single book and most of the articles in the hobbyists' magazines pointed out the many difficulties of keeping this fish.

I wanted to prove to myself—and also to the experts who wrote those books—that it isn't as difficult to rear and breed these fish as they would have the novice believe. Having seen some of the most beautiful 7 in. Brown Discus at a dealer's, I was so impressed that in a moment of madness I bought 6 smaller specimens. They were just about 1 in. in body length. I believed that it would take 12-15 months for me to find out whether I was capable of achieving what many consider to be the "ultimate" in tropical fish keeping: breeding this fish and raising the fry. Well, I have done it; it has taken a little longer, but the 70-odd fry must surely be compensation enough for the effort and time spent.

I will acknowledge some of the difficulties but would like to say again that most serious hobbyists are capable of looking after this fish. They must just devote some time to learning to understand the particular needs of this species.

Although I also keep *Symphysodon discus heckel* and *Symphysodon aequifasciata haraldi*, what I am about to say refers to *Symphysodon aequifasciata axelrodi*—the Brown Discus—since they were the oldest and were the first to raise a brood.

The 6 small fish, which had been kept in London tapwater by the dealer, were put into a 48 in. × 18 in. × 18 in. tank; this was furnished only with a few rocks and a bottom covering of lava chips. It was without plants of any kind and was certainly no showtank; but then it was not meant to be.

One of the fish died within a few days and the remaining 5 seemed to be eating well and generally

happy. At that time what mattered most to me was that the fish should take their food. After a while I started to reduce the hardness of the water by replacing part of it with purified water. This I continued until the water had a hardness of 6° dGH. The Discus fed 3-4 times a day and took all foods readily, even dried flakes. For the first few months their growth was very noticeable and I felt that I was on the way to success.

After some time it became apparent that the fish were not as happy as before and after re-reading all the relevant literature I became convinced that the aquarium needed some plants. This was confirmed by a successful Discus breeder and so I bought some *Echinodorus martii*. These were put into the tank in small plastic flower pots; I didn't notice that the fishes' behaviour altered in any way, but I supposed that they needed a little more time to get used to their new environment. After another 3 weeks they seemed to have settled down but the plants were not doing well. The high temperature (86°F) and softness of the water did not suit them, and they lasted only a few months; they grew a fair number of new leaves, but never reached a height of more than a few inches. Although the water was filtered with an Eheim 476 I was still unable to keep it crystal clear, due to the dying plants. At this point I decided to remove all the plants from my Discus tank (I had had very little joy from them anyway). The fish did not seem to mind and I thought I was one step further towards understanding their particular needs.

Having always adhered to the strict rule of a 20% weekly water change I felt that the water must be in perfect condition. Before every water change I measured the pH, dGH, dKH and also the Nitrite content of the water. The results were always more or less the same except one day when I found that the level of Nitrite had risen to a dangerous level. Having

partly changed the water and filtered it through a special kind of Nitrite-removing resin I thought that by also putting a U/G filter into the tank I could prevent this from happening again. Since I considered myself still a novice I tried to find out what other Discus keepers thought of this idea. Most felt that it was a fairly good way of filtration but none had ever used it on a Discus set-up. I reasoned that it could not possibly do any harm but might do a lot of good and I decided to take a chance.

The fish, which by now had grown to about 3-3½ in., were quite used to having their environment interfered with. I completely cleared out the tank and found that large colonies of *Tubifex* and White Worms were living under the lava chips. This was the cause of the high Nitrite level I had previously noticed, and I decided to feed more sparingly. I installed the U/G filter and covered it with 3-4 in. of lava chips, feeling certain that this, together with a big Eheim, should keep the water in perfect condition. I even decided to try once again with some plants. This time, though, I slowly acclimatised the Amazon sword plants and I felt that I had achieved a better set-up.

The fish appeared to be in good condition, their colouring ranging from a golden yellow to a chocolate brown with varied streaks of red and blue on their bodies and fins; they were a beautiful sight. Their fins were always erect and this is a recognised sign of good health. The quality of the water was maintained and the fish were feeding well; now it could only be a matter of time before I would witness the laying of the first eggs. I never had any doubt that I would get a pair from these fish although there were no signs of pairing. Just one leader (not the biggest either) and his entourage.

During a visit to Germany I went to see many of the Discus establishments and was told by a breeder that for these fish to remain in a healthy condition the tank must be free of all clutter; they ought not to be able to hide themselves and would eventually become tame. I could not imagine my Discus becoming tame, since they seemed to mind the slightest movement in front of the tank. They would go wild and hide behind the rocks and plants, and would not reappear for quite a long time. I was never able to show these fish to any of my friends since these were reluctant to stand motionless for long periods in front of the tank until the fish reappeared.

When I returned to London I decided to remove all rocks and plants from the tank. For the next few days I wondered whether I had made the right decision since the fish became even more frightened than before and I was willing to give them back the rocks. But due to other commitments I did not have the time, and after a while they seemed to have settled down: to my astonishment they no longer reacted violently to someone approaching the tank. Since

then I have never used any rocks or plants in any of my Discus tanks. I thought of the German Discus breeder who was maintaining 200 tanks with nothing but airstones. How could he have spared time for looking after plants, when looking after this number of Discus is a full-time job in itself? If he was able to care for such a large number of these fish, then surely a hobbyist with more time must have a better chance of raising these fish. The German breeder also told me that if the water conditions are right the Discus becomes a comparatively easy fish to maintain. He could be right—how else could one explain the variations in their behaviour in the same set-up? The water quality must play a very important part. Hobbyists know the fundamental requirements but slight adjustments might be necessary, which the enthusiast alone can judge from the behaviour of his particular fish.

The fish continued to look healthy and in good condition—except for one. He was much smaller and thinner than the rest and I also noticed the appearance of yellow and white faeces. According to Professor Dr. Reichenbach-Klinke, a well-known expert on tropical fish diseases, these are signs of an intestinal disorder for which there is no cure; one must expect to lose these fish.

I watched them for hours to see whether only one was infected or whether they all had this disease. To my great disappointment I found that all the fish were infected to some extent. After almost one year of caring for these fish I was almost ready to agree that the Discus is not a fish for a beginner, and to admit defeat—almost, but not quite.

Not very much is known about this disease—I found it mentioned in a few publications, which suggested that antibiotics should be mixed with the food. I decided to give my Discus a more clinical environment. I therefore removed all the gravel and the U/G filter but continued filtration with the Eheim. Now, at least, I could syphon out all uneaten food before it got sucked beneath the gravel by the U/G filter. The fish did not seem to like the white polystyrene sheet the tank was standing on. Many writers who advocate a gravel-free tank for Discus suggest that the underside of the tank be painted a dark colour. Having bred many thousands of Angel Fish in such tanks I noticed that they did not seem to care too much for their own reflection; so I chose slate for its matt surface. I used silicone rubber adhesive to glue pieces of new roofing slate to four sides of the tank.

To try to cure the intestinal disease I increased the temperature of the water to 95°F for 10 days. There was no sign of any improvement. By chance I came across a Vitamin complex from Halena sold under the trade name of VIT min. It contains an intestinal protective colloid as well as an antibiotic agent. It is

suggested that the live foods should be soaked in some water to which a few drops have been added; and this I did. To my surprise I noticed fewer white and stringy faeces. I do not claim to have found a cure but it is a fact that the faeces are now normal and the fish show no signs of any ill-health. I cannot say whether this is due only to the use of the Vitamin complex or whether there were other factors. With my confidence restored, I looked forward to a successful outcome.

Other Discus diseases never worried me; the most feared, the hole-in-the-head disease, I never had to deal with but knew that I had the necessary medication available. I also had some of the new German wonder drug which will cure more than 13 different ailments. If I were to fail, it would not be because of the lack of the right kind of medication.

I kept the fish in what I considered to be a very clinical environment; the pieces of slate were not easily kept clean and I decided that they had to come out again. I replaced the slate with a single sheet of matt black perspex. While the silicone rubber adhesive was curing for 48 hours I found that about 40-50 eggs had been laid against the sides of the little 20-gallon tank. By next morning the eggs had been eaten but I was able to separate out what I believed to be the parents.

These were put back into the 45-gallon tank and I watched them very closely for the next week. There were no signs of any love play; I became very impatient since I knew Discus were capable of laying eggs as often as every 4 days.

One Sunday afternoon I noticed a difference in the pair's behaviour and put a sheet of slate against the side of the tank for them to lay their eggs on. The fish took no notice of anything going on around them and were swimming all around the tank. Whenever they met, they would erect their fins to almost breaking point. As soon as they were "face to face" they would bow and swim apart. The caudal fins became much darker, the stripes going through their bodies were hardly noticeable and this bowing continued for about 2 days. After that the male started to clean the inlet tube of the filter. He would occasionally shake his body and trying to induce the female to follow him to the inlet tube. Sometimes she followed but mostly went her own way. The female fed well but all food was ignored by the male.

The bowing and shaking of the male became more frequent and the caudal fin became completely black. The female showed her readiness by responding with shaking. Together they cleaned various places in the tank. Next evening they were both cleaning the piece of slate. If anything the female took it more seriously, her egg-laying tube was showing, being larger and more round. After a few practice runs the female started to release her eggs in neat little

rows. At the beginning there were only about four at a time but later this increased to more than eight. The male would then glide over the eggs and fertilise them. Occasionally, the pair would slide up the piece of slate together to carry out the act of spawning. This continued for about one hour and I estimated that approximately 120 eggs or more had been laid. The female seemed to lose interest and started to look for food. This was provided and readily taken. They took it in turns; while one was looking for food the other guarded the eggs. I thought that by giving them a larger amount of food I could prevent them from eating the eggs. Once they lost interest in the food, they both guarded the eggs, fanning them steadily with their pectoral fins and occasionally blowing away any dirt that had settled on the eggs. I watched this for hours and felt that I had achieved my ambition.

Late at night and also the next morning the eggs were still there; I didn't remove the few which had fungused, so as not to interfere with the parental instinct.

At night the eggs were eaten and I was very disappointed. Exactly one week later the pair spawned again. The sequence was the same except perhaps that the preliminaries did not take as long. These eggs were also eaten within 24 hours. For the next 7 weeks I could witness a spawning at weekly intervals. The longest the eggs survived was about 50 hours. I knew of many breeders who had had to wait much longer than I had done so far and I was not too discouraged. After the first disappointment at the first spawning I took little notice of the weekly happenings. One day I was bound to succeed!

Eventually, at spawning number 10 the eggs hatched after 55-60 hours. The fry were sucked free from the burst egg shells and carried to another spot. The black wriggling fry hung on the side of the tank in a cluster. Whenever one fell off, it was caught by one of the parents and spat back on the cluster. I was feeding bloodworms to the parents and the latter mistook them for fry and also spat them on the cluster of fry. I stopped feeding until the fry became free-swimming. A few were free-swimming after only two days, but all of them after 2½ days. Soon they were taking their first food from the bodies of the parents. This first food—Discus milk, as it is sometimes known—forms an essential part of any successful rearing of the fry. Although there are some breeders who claim to have found a way of raising fry away from parents, their methods are not known. The milky appearance on the sides of the fish became very apparent, though more visible on the body of the male. The young fry were continuously picking at his body and very seldom going to the female. The parents were showing their "yellow" head and according to Dr. Geisler, this indicates their willing-



ness and capability to raise the fry. On the fourth day after the fry started swimming free I gave newly hatched brine shrimps. These were ignored by the young. I tried again two days later and could see that they were being eaten. The fry freed themselves from the parents after about 12 days although they would take an occasional nibble at their bodies. The young were fed with newly hatched brine shrimps 6-8 times a day and as soon as they were capable of managing larger foods, e.g., sifted *Daphnia*, Micro-worms and minced *Tubifex*, these were provided. Amongst this brood were 7 "belly sliders" which I removed after 3 weeks. The rest were growing fast and eating well.

To show that my first successful spawning was no fluke, the Discus obliged 44 days later by laying eggs, which hatched after 60 hours, were free-swimming after 3 days, consumed large quantities of newly hatched brine shrimp and became little Discus.

I have succeeded in rearing many fine specimens of Discus. I hope my experience may encourage other enthusiasts to have a try at keeping Discus but do not claim that my system is the only one that could possibly succeed. Aquarists willing to experiment, and with the patience not to demand instant results, have an excellent chance of evolving their own system of breeding and rearing these fish.

## What is your opinion?

*continued from page 341*

I consider Mr. Fowler's 'tip'—or rather, suggestion—to provide an 'exchange column,' to be a potentially interesting one. I feel that such a column could be most useful to a variety of readers, and could be used for exchanging plants and smaller pieces of equipment as well as for fishes. However, it should be noted that (as far as I know) it is against Post Office regulations to send liquids through the post. (This would rule out the sending of fishes through the post; however, plants and equipment could be sent through the post, and fishes sent by other methods of carriage; and perhaps 'exchangers' who might live fairly close to one another could exchange items in person.) Care to comment? I have not heard of any dangers from white worms before. Have any other readers? If so, please let me know. I assume that any spores associated with white worms would not come from the worms but from moulds which sometimes grow on the medium in which the worms are cultivated, or on the food used to feed the worms.

Master S. Barstow is 11 years old, and lives at 23 Horner Crescent, Carlinghow Lane, Batley, Yorks. He writes: "I have been keeping tropical fishes for just over three years and I find that the Malayan (live-bearing) snails, which were mentioned in the October edition of *The Aquarist*, are the most useful because during the day they stay under the gravel and keep it fairly clean; during the night they come up and eat the waste. The best tip I can give other aquarists is to get some of these snails."

Well, once again the space has been used up before the letters have been used up. I've still got a few more readers' letters containing tips but, as there are still a number of days to go before the end of the month, I've decided to postpone awarding my prize for the best tip until I've received all the letters that may be on their way to me. I'll forward the prize to whoever I decide is the winner after the end of this

month (October), and it should arrive in good time for Christmas. I'll publish the winner's name, address and tip—and say what the prize was—in next month's edition. (Remember, the winner could still be a reader whose 'tip' has appeared in this month's feature: it all depends upon what reaches me before the end of the month—and on the couple of tips which I have already received but have not had room to include in this month's pages.)

For next month—and next year—send me your opinions on any of the queries raised above, and on the following—and remember, send them to B. Whiteside c/o *The Aquarist*, **printing** your name and address clearly, adding the *date* to your letter, and keeping your letter fairly brief, if possible. If you use the proper names of fishes, please *print* them clearly—and check that they are correct! I would also remind readers that I reserve the right to shorten letters where I consider it appropriate, and I do not necessarily agree with the opinions expressed by readers in their letters. However, don't let these few instructions put you off writing: they just help to make my job a little bit easier. (a) What have been your experiences with the breeding of angelfish? (b) What is your opinion of the view that tanks can be kept too clean. (c) What is the largest number of babies you have managed to raise to maturity from a single spawning of any species of fish? (d) Please send me details of breeding experiences with kissing gouramies. (e) How good a live food are micro worms and how do you remove them from their culture medium? (f) What brand and type of tungsten bulb have you found to give the best plant growth in your aquaria? That's the lot for this month—and this year. Don't eat too much Christmas pudding—and if you get bored during the holidays take a few minutes off to write me a couple of paragraphs for a future edition. Enjoy yourselves!

materials were taken from the centres of five different areas in the same well-established, bacterially matured sea aquarium.

All the cultures were then incubated at 25°C (77°F), a temperature at which previous work had shown optimum development of nitrifying bacteria would proceed. After ten days there was a most apparent difference in development of the colonies of nitrifying bacteria as follows:—

Beach-shingle (silica = SiO<sub>2</sub>)—yellowish colonies approx. 4 mm. dia.

"SeaCoral" (silica = SiO<sub>2</sub>)—yellowish colonies approx. 4 mm. dia.

Coral-sand (mostly CaCO<sub>3</sub>)—yellow-brown colonies 7-9 mm. dia.

Crushed Sea Shell (mostly CaCO<sub>3</sub> + Mg)—brown colonies 9-10 mm. dia.

Silver-sand (silica = SiO<sub>2</sub>)—results as for beach-shingle.

*This showed quite conclusively, then, that calcium carbonate, whether in the form of coral-sand or crushed-shell formed a more nutrient substrate for marine nitrifiers to grow on than does any kind of silica.*

Later, I went on to test crushed limestone (also a form of calcium carbonate + CaCO<sub>3</sub>) against both coral-sand and crushed sea-shell, since crushed limestone in several grades is cheaply available in the U.K. Unfortunately, whereas it (limestone) gave better results than any form of silica, it was not as successful a substrate for the growth of nitrifying bacteria as either crushed-shell or coral-sand. An additional problem with the crushed limestone which we very quickly discovered was that it liberates a white dust which seemingly no amount of washing will get rid of.

At around this same period (1966-1968) I also determined experimentally that the following factors impede the maturation of a gravel filter-bed.

- (a) *Too high or too low a temperature.* The optimum temperatures range for the several species of marine nitrifying bacteria which I collectively grouped under the names Nitrosomonas (ammonia-oxidisers) and Nitrobacter (nitrite-oxidisers) appeared to be 75°F to 80°F. Individual species of nitrifying bacteria probably have widely varying preferred temperatures, hence the large range given above.
- (b) *Too low an oxygen tension in the system.* All nitrifying bacteria appear to be aerobic, gram-negative bacteria and are strictly autotrophic.
- (c) *Too little surface area of substrate on which to grow.* Nitrifying bacteria are strictly sessile in habit, i.e., they colonise solid surfaces within the aquarium. Thus the greater the depth of the filter bed (within reason) the greater is the surface area of individual particles for the bacteria to colonise. Also, whilst on this point, it should be noted that one pound wt. of gravel of mean

particle size (say  $\frac{1}{8}$  in. -  $\frac{1}{4}$  in.) has a much greater total surface area than one pound wt. of gravel of mean particle diameter (say  $\frac{1}{2}$  in. -  $\frac{3}{4}$  in.). Thus not only is weight of the filtrant material important but also the grade of that material.

- (d) *An inadequate turnover-rate through the under-gravel filter.* We have already seen that nitrifying bacteria are aerobic in their respiratory habit—that is to say, they require oxygen and excrete carbon dioxide. If the movement of seawater down through the gravel is too slow, there is a danger of water being de-oxygenated by the time it reaches the lower levels of a deep filter-bed. This is not to say however that U/G filter airlifts should attempt to churn the seawater into butter. Nothing could be more damaging to both the sea aquarium occupants and one's eardrums than that. The best method to employ in determining the ideal turnover-rate for a U/G filter is to run it as "flat-out" as one's nerves and the tank's occupants can stand until maturation is complete (i.e., until the nitrite reading falls to zero and stays there for 5 days or so), and then slowly reduce the air supply to the airlifts until a slight nitrite reading reappears. At this point the air-feed can be increased slightly until the nitrites disappear again.

*N.B.* It is important to use the British nitrite test kit for this determination since some of the poorer foreign ones show no nitrite reading when the true nitrite content of the water may be as high as 5.0+ p.p.m. One must also appreciate that whenever the biological loading on the system is increased (e.g., new fishes or large invertebrates are introduced) so must the turnover-rate be marginally increased.

- (e) *The correct pH and specific gravity.* The optimum pH range for most nitrifying bacteria appears to be pH 8.0 to pH 8.8, although one should note here that almost all higher marine organisms (fishes, algae and invertebrates) become progressively more unhappy above pH 8.3 to 8.4. Thus from a marine aquarist's point of view pH 8.0 to 8.4 becomes the only workable range, and one that is well within the preferred range of nitrifiers. So we see that "tired" seawater (i.e., old seawater from which the alkali-reserve has been depleted) or incorrectly-formulated artificial seawaters in which the alkali reserve is too low, are likely to cause extended maturation periods.

Returning now to the specific details of your problem, I would suspect firstly that your filter bed is probably pure silica in content. Consequently although nitrifying bacteria will form on silica, they

Continued on page 354

# From a Naturalist's Notebook

by Eric Hardy

THE young minnows born in the American Skylab's recent couple of months in outer space adapted themselves quickly to the weightlessness which so concerned the physiologists. The minnows died shortly after their return. Most fish can develop conditioned reflexes like Pavlov's dogs, either as a direct result of stimuli or as the result of imitating other fish separated by a glass plate and responding to stimuli. Once acquired, they do not disappear quickly; they are retained even after a month's interruption of tests. Anchovies which developed conditioned defensive reflexes against hook-and-line angling in Russian experiments gave some evidence of passing on this experience when placed in a shoal of "untrained" fish.

Among technical literature I receive from the very scientific San Diego Natural History Society which, unlike many English regional societies of similar title, isn't a rambling club of nature-diarists, is an account of one new genus, two new species and six new sub-species of Cyprinid fishes surviving in isolated post-Pleistocene waters of Pacific North America. The genus and its species are named *Relictus solitarius* accordingly, and the type specimens are deposited in Michigan University museum. The new species are of *Gila* (chub), and the sub-species are of existing *Gila* and *Rhinichthys* (dace) species. In defence of England's provincial societies one should add that most are amateurs without the vast financial subsidies which enable people to make such work and publication of specialists' papers. These, like many in our Zoological Society's journal, are only read in total at meetings, and never form an audience-attracting lecture.

A recent fascinating development of waterlife studies has been by wiring a "pinger" or tag of sonic and ultrasonic tracking equipment to the backs of giant Alaskan king crabs, to trace their movements in the Bering Sea. The directional hydrophone is rotated in the water (over the ship's side) until the maximum signal is received. The direction then indicates the whereabouts of the tagged crab emitting the signal from its 5-day, electronically-activated tag, which is fixed to its back on a plaster of paris base before wiring, and weighs 2.9 oz. in water (little more than half its weight in air). It took crabs about 30 minutes to recover from handling during tagging. Effective signals were picked up, offshore and inshore, up to

0.8 nautical miles in 57 fathoms, and at 0.4 miles in 117 fathoms. The chief danger is that weight-balance characteristics of the tag may turn the crab upside down in fast water.

While the National Trust is negotiating the acquisition of well-known Hilbre, three tidal, sandstone islets in the Cheshire Dee estuary off West Kirby, the secretary of its bird-ringing station sends me its 1972 Report. This shows that two Liverpool University zoologists failed to find, in the island's weedy, summer-drying pond, any of the anticipated waterlife which migratory birds had been thought likely to bring there. Regular migrations of birds have to visit waters frequently to introduce new plants and animals, as I found when studying their influence on plant life in the modern Jewish carp-growing ponds in the Jordan Valley and by the Dead Sea. Most of Hilbre's wader visitors keep to the tidal rocks: one rarely sees any of them at the pool, whereas waders, duck, squacco herons, flamingos, etc., regularly visited and introduced plants to the Jordan fishponds. Flying aquatic insects (even dragonflies) can distribute *algae* and *protozoa*, duck may distribute *Daphnia* and other plankton; plovers may spread small shellfish, and many birds spread water-plants by seed or vegetatively.

The Hilbre pond's commonest inhabitants (apart from water-crowfoot and filamentous *algae*) are *Tubifex*, the common fluke-pondsnail *peregra*, and the worm *Lumbriculus variegatus*. These also dominate the frequently (now almost constantly) dried-out big Massam's Slack on the Ainsdale Nature Reserve on the Lancashire dunes near Formby. Here the waterlife was likewise found to be divided between things like leeches which die off when it dries out (like Ainsdale's leeches), those which survive it like some flatworms and *Lumbriculus*, and those which escape when it dries and return when it refills, like bugs and beetles. But the Hilbre report errs, through insufficient liaison, in stating "unfortunately there are no records of the frequency and exact dates" of the pond's periodic drying-out, for these were often logged in our diaries before the modern monopolising of the island by one group.

In marked contrast to public display aquaria are several practical fish-collections kept in universities. Recently, Professor W. T. Potts kindly showed me over the aquarium at Lancaster University. Although

this has five large display-tanks inserted in the corridor wall in the biology department, with good habitat-exhibits of flatfish, anemones, pipefish, bullheads, lobster, cod and scallops, inside the marine aquarium room one finds only a number of large, waist-high opaque plastic tanks of flounders and lobsters which one looks into from the top. The aquarium is in three divisions: hot, cold and marine, breeding only *Tilapia morambica*, which tolerates such a wide range of temperature, and whose males sometimes eat their own young. The cold (freshwater) section has trout in dechlorinated water, where the influence of calcium has been studied. The marine aquarium is recirculated with water supplied in regular changes, by glass-lined milk tank-lorries, from the swimming pool by Morecambe Beach, on the Lancashire seaside. When the aquarium was designed in the new university, Professor Potts told me, he stipulated no copper piping; but, to his dismay, an all-copper outfit was built. It was only with much trouble that he persuaded the builders to remove the copper from the marine section.

Apropos the rare pipe or trigger-fish (*Balistes caprisus*), a coral-feeding fish from the tropical Atlantic, which occasionally drifts into our western seas, like one I mentioned trawled last summer from Morecambe Bay lighthouse. Mr. E. I. S. Rees, tutor at Bangor University marine labs at Menai Bridge, tells me of two other records in recent years; from a lobster pot and a trammel net off Aerdaron on the Llyn peninsula, and our sea-fisheries committee staff biologist tells me of another (which he didn't see to confirm) stranded last summer in a rockpool near Maryport on the Cumberland coast.

According to a Council of Europe report I received,

specimens of fish deformed as a result of ingesting pollutants, have been found in 43 of Japan's 47 administrative districts. Since the cases of Minamata disease, Japan developed a fish-scare, like the U.S. Americans after the lead analysis in tuna. Did you know that cyanide occurs naturally, but harmlessly, in shellfish? Apparently the public analyst was unaware of this when in last September's incident of cyanide pollution of a stream in Anglesey, a dangerously high content was reported in local Menai Straits mussels. When these reached the sea-fisheries laboratory at Lancaster University for analysis, it was found that the natural cyanide content, which is harmless to humans in its natural form, had been unknowingly included in the original analyst's report, thus giving a misleading content. Unfortunately, pollution, being topical, makes instant headlines and a fanfare of publicity, which isn't always tempered by later information after all the relevant facts are investigated, or by even waiting for them in the first place.

While a large number of chemicals used in modern weed-killers and fungicides, insecticides, earthworm-killers and soil-sterilants are harmful to fish if wind drifted or drained into the garden fishpond or lily-pool, one of the major causes of loss of goldfish, golden orfe, etc., even in suburban garden pools is daybreak visits from herons, even if no herony is close by. This can be thwarted by either encouraging sufficient lily leaves to hide the fish, or criss-crossing the pond with widely spaced green thread, and avoiding standing ground around the bank or on fountains. At one Welsh trout hatchery I photographed a gin-trap set illegally to catch such visiting herons, and even kingfishers.

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## MARINE QUERIES (continued from page 352)

do not form colonies of either the great size or vigour which are formed on a calcium carbonate substrate such as coral-sand or crushed shell. This is a *chemical* shortcoming. Now add to this the physical defect of silica—namely that it is *solid*. The better forms of coral-sand are made up of tiny particles, each one of which is porous to an amazing degree. Thus you will see that, weight-for-weight, the total surface area of comparably-sized particles of coral-sand is much greater than that of silica.

So, I would repeat again that I think that your filter bed is *already* matured. What is wrong with it is that owing to some design fault (e.g., inadequate turn-over rate) and/or incorrect chemical/physical parameters (wrong pH, wrong S.G., which would be around 1.020 at 75°F, semi-stagnant water, low oxygen tension in water etc. etc.) and/or your filter-

bed is inadequate (see considerable discussion above). **IT IS THE NITRIFICATION POTENTIAL OF YOUR FILTRATION WHICH IS INSUFFICIENT** to cope with the present biological loading albeit only a lowly one.

All the chemical and physical parameters of your system you can easily check for yourself. If these are all within acceptable limits, I suggest that you purchase a few pounds wt. of coral-sand and crushed-shell. Place the crushed-shell under the existing silica, and the coral-sand on top of the silica. By all means wash the crushed-shell before using it, but do not wash the coral-sand unless you have some old seawater to hand for the purpose.

You will find within 10-14 days the water in your aquarium will fail to show a nitrite reading, even on the hypersensitive British test kit.

## THE HARDY EUROPEAN REPTILES AND AMPHIBIANS IN CAPTIVITY (Part 19)

by Andrew Allen

An immense variety of closely related small lacertids inhabit the South of Europe. Most of them require fairly similar care.

### 40. The Ruin Lizard (*Lacerta sicula sicula*)

*Description.*—This is the largest and most colourful of the Wall lizard group. It grows to 25 cms. in length, and has a long tail. Dorsally it is bluish-green with black patches (often with a blue centre) forming regular or irregular bands. The belly is a subdued cream, yellow or green.

*Distribution.*—The type is very abundant in Southern Italy, the Lipari islands, and parts of Sicily. It favours dry, rocky country and is common upon old walls.

*Breeding Habits.*—Up to ten eggs at a time may be laid in shallow holes in the ground, usually during May or June.

There are a host of sub-species, about twenty in all. The only one commonly to be seen in this country is *Lacerta sicula campestris*. It is a glorious grass-green, with a brown band down the back, usually spotted with dark patches. Females may have a deep blue patch on the shoulder. It comes from Northern Italy, Northern Yugoslavia, Monte Cristo, Elba and Corsica.

Related lacertids are:

*Lacerta wagneriana*—from Sicily, with uniform green back and brown flanks.

*L. lilfordi*—from the Balearics; sometimes imported into this country.

*L. bedriagae*—from Corsica and Sardinia, an exclusively montane form.

*L. dugesii*—from Madeira and the Canary Islands.

*L. oxycephala*—from Dalmatia, known as the Sharp-headed lizard. It is dark blue-grey dorsally, and a rather lighter shade below.

*L. heiroglyphica*, *L. praticola*, *L. horvathi*, *L. mosorensis*, *L. graeca*—from Sporades and Rhodes.

*L. peloponnesiaca*—an attractive and statuesque lizard from montane parts of the Peloponnesus.

*L. taurica*—a very similar lizard from Russia, Rumania, Hungary, Bulgaria, Albania, Yugoslavia and Greece.

*L. erhardii*—from Greece, Albania and the Aegean Islands; exists as numerous sub-species.

*L. melisellensis fumana*—from Albania, Yugoslavia and its islands. The Rock lizard and its related sub-species are sometimes imported into this country. It comes from rocky, montane areas, and is characterised by a short head and a brown or copper-red dorsal coloration.

*L. saxicola*—from South-East Europe, is another lizard infrequently to be seen on dealers' lists.

*L. bocagei*—from the Iberian Peninsula, is a Spanish equivalent of the Wall lizard. It is green, olive or brown dorsally, with two white lines down each side of the body. The stripes are bounded by rows of black patches, which sometimes merge into bands. There are numerous sub-species.

*L. hispanica*—from the Southern coast of Spain, is a very small lizard with a pointed head, and grey or green coloration. It is not very abundant.

*L. monticola*—from mountainous parts of Spain and Portugal, is very similar to the "true" Wall lizard, but has a flatter body and more pointed head. The belly of the male is bright green, that of the female yellow. There are several sub-species.

### 41. The Wall Lizard (*Lacerta muralis muralis*)

*Description.*—Maximum length is about 20 cms., males usually being longer than females. The body is slender, and the tail very long. Dorsal coloration may be several shades of brown or grey, marked by small black spots in the male and rows of patches in the female. The belly is cream or yellow, sometimes with black and blue spots at its outer margin. In general coloration is rather more drab than in other Wall and Ruin lizards.

*Distribution.*—This is the ubiquitous and familiar Wall lizard of much of Central Europe, the type being

found in Pyrenees, France, Apennines, Belgium, Holland, Southern Germany, the Alpine countries, parts of the Balkans and Asia Minor. The major sub-species is *L.m. bruggemanni*, which is indigenous to North-West Italy, and now occurs also in the Danube valley near Passau. It is greener in coloration than the type. Numerous other sub-species come from Calabria, Corsica and Sardinia, many small Adriatic islands, Yugoslavia, Albania and Greece. Dry sunny habitats are favoured, including rocky slopes, vineyards, meadows and old walls.

*Breeding Habits.*—As for *L. sicula*.

*Care in Captivity.*—The following remarks apply in varying measure to all the Wall and Ruin lizards described above. Some of the most Southern species or sub-species may be less hardy than *L. muralis*, but otherwise their requirements are similar.

These animals do fairly well indoors, provided that they are given a very spacious vivarium with much opportunity for climbing. There should be a small water bowl, some sun-drenched stones or tiles, extra heat and light, and a goodly number of hiding places. It is important that the vivarium be thoroughly escape-proof. Wall lizards are small, and fast, and can climb practically anything. They will soon wriggle through a crack, or race up the arm that feeds them. One of my first pair of Wall lizards escaped three times from an apparently impregnable vivarium. The third time it got clear out of the house as well, and spent the next couple of years laughing at me from the safety of a rockery in the garden. Don't take any chances; all these lizards are like living quicksilver.

Most Wall and Ruin lizards are hardy enough to be housed in an outdoor reptiliary. But again this must be perfectly designed and constructed. The boundary walls must be high (about three feet) and smooth. The overhang must be wide and flawless, with a minimum of joints. No tall vegetation should be permitted to grow near the walls. Take all these precautions, and I would still be prepared to place a small bet on the lizards getting out at some time. One danger period is the feeding session, when lizards are climbing all over you, exploring your pockets, sunning on your shoulders or the top of your head. It is easy to forget just one, perhaps the one that has gone to sleep inside your shirt, and walk out with it. So be warned. However, if all due precautions are taken, the inhabitants should stay put and do very well indeed. A sunny, lightly planted reptiliary with deep hibernacula is ideal for these species.

Excellent also is a greenhouse, which must be well ventilated and dry. All cracks and potential egress routes must be rigorously sought out and blocked. A greenhouse provides an admirable climate for the semi-hardy Southern species, and gives much more vertical climbing space than either indoor vivarium or reptiliary. One good idea is to train variegated ivies up

the back wall of the greenhouse, thus providing a wealth of opportunities for acrobatics. Alternatively, it would be possible to construct a stone wall along the rear of the greenhouse. With cracks and creepers this could be designed to mimic a crumbling Italian farmhouse wall or similar. Especially suitable for such a purpose would be a lean-to greenhouse, where the appropriate wall would be ready and waiting. The opportunities for one of artistic bent are almost endless, and the end result could be of great aesthetic quality.

All are very easily fed, accepting a whole range of small invertebrates. As with most lizards, spiders are number one in popularity, closely followed by mealworms. House flies and bluebottles are taken eagerly and athletically. They are best raised from maggots rather than caught as adults, to avoid contamination from insecticides used by well-meaning neighbours. Raw meat may be offered if all other fare is totally unavailable. In company with the majority of lacertids these lizards have a "sweet-tooth," and will relish a taste of demerara sugar or honey. This should be reserved solely for an occasional treat, and not be placed on the menu too often. Ripe soft fruit of many kinds will also help to add variety, and can be most beneficial to the health of these lizards.

These are good community animals, and can be associated with a pleasantly wide range of companions. Smaller Reptiles and Amphibians will never be molested, except when very young indeed. In consequence Wall lizards can be housed with practically any of the moderate-sized frogs, toads, newts and lizards, assuming, of course, that the appropriate different habitats are provided.

Despite their marvellous agility, they are potential prey for a number of larger predators. Green, Eyed and Schreibers lizards are not to be trusted in their company, and this applies to all the snakes as well. In addition, I have my suspicions of Marsh and Edible frogs, Clawed toads, and of big mama Common toads. It could be argued that in nature Wall lizards and some of these creatures co-exist perfectly happily. This is quite true, and I have often seen Green and Ruin lizards sunning together or Wall lizards and Edible frogs beside the same pool. Unfortunately, this constitutes no guide to composing a harmonious balanced community. The essence of a vivarium is that it is extremely cramped. There just is not the space for these lizards to escape from their foes, especially over a period of time. One other point should be remembered; there will always be intense territorial competition between males of the same species. In the wild the losers can retire to lick their wounds, in the vivarium they are confined in the company of their successful rivals. Thus there should only be one or two males per large outdoor vivarium, though seven or eight females can be housed in the same area with only minor bickering.

Any of the lizards described will fascinate through their varied, sometimes spectacular, colours and their extreme agility and pleasing activity. Most are easy to keep and tame fairly rapidly; some are quite reasonable in price. The more familiar species can be recommended safely to the moderately experienced

amateur. The expert will find great interest in some of the more obscure, less hardy examples of the great group of "Wall lizards."

The final article in this series will deal with our own Slow-worm, and the Glass snake or Scheltopusik, largest lizard in Europe.

## A REEF IN OUR HOME

by

Douglas Rose (B.M.A.A. member)

ABOUT SIX months ago my father and I decided that a go at marines would be fun. We had seen a number of marine tanks around and they were, in our opinion, startling. It would be unfair to compare them with their freshwater counterparts as it would be like comparing an aeroplane with a car.

We finally decided to go in for marines after we had read the following books: "Tropical Marine Aquaria," by R. A. Risely; "The Salt Water Aquarium in the Home," by Straughn; and "Tropical Marine Aquaria," by Graham F. Cox. We also consulted three other paperbacks: (1) "The Marine Aquarium for the Home Aquarist," by Robert F. O'Connell; (2) "Enjoy a Saltwater Aquarium" (the Pet Library); and finally, "Saltwater Fishes in Colour," by Dr. Herbert R. Axelrod. We had visited certain well-known marine dealers in Middlesex, Edgware and Guildford. They had some wonderful exhibits which boosted our desire to try this side of the hobby further.

After a great deal of thought we decided that it would be far more interesting and rewarding to set up the tank ourselves—unlike our discus tank. ("Prolific Pompadours," September, 1973).

The main problem was to decide what system to use. People have had great success with the natural, semi-natural and clinical systems. They all work; but of course some people prefer one system to another. At



Mandarin Fish

Photo. D. Rose

first we decided to use the natural system; but after using this for a couple of weeks our tank became rather dirty and we at once fitted up an Eheim power filter. We were told to do this by a very reputable dealer in Guildford. We have never regretted doing this and we are indebted to him for this advice.

Even though I said that we at first used the natural system, I must admit that our only extra device was an ozoniser. Our system thus consists of aeration, power filtration through charcoal/carbon and wool, and ozone (weak). So much for the type of system we use. We decided that a 48 in. x 15 in. x 24 in. (high) all-glass tank would be ideal. Next we obtained two 150w. combined heater and thermostats which could be adjusted under water. We bought an excellent make of salt called "New Tropic Marin" and also obtained a packet of Hilena Integral (an excellent plant fertiliser). We then bought a few bags of crushed coral sand—enough to cover the base of the tank to a depth of about half an inch. We bought two 3-foot 30w. Kolor-rite fluorescent tubes. The colour of the tubes was chosen after very careful consideration of the light spectrum of the various types available and it was considered that Kolor-rite was the nearest the light spectrum of the various types available and approach to pure daylight. We also put light blue photographic background paper on the tank to provide

a very natural effect. We used a powerful airpump and two wooden diffuser blocks. After we had acquired all the necessary equipment we went ahead with the setting up of the tank.

First, we covered the base of the aquarium to a depth of about half an inch with washed, crushed coral sand. We then filled the tank with tap-water to about 75 per cent full. Then we added the "New Tropic Marin" salt—enough for 45-50 gallons. We then heated the water to a temperature of 78°F. and we checked that the salinity was around 1.022 to 1.023. When everything had settled and the water had been left standing for a week, we decided to buy a considerable quantity of living rock and obtained enough to form a miniature reef around the tank. We did, however, use a number of Westmorland rocks which we meticulously boiled. The living rock has kept the water crystal-clear and the tank looks unbelievably natural.

The living rock itself is really interesting. In just one piece in our aquarium we have seen clams, sponges, algae (including a red *alga* and one which looks like green light bulbs), numerous small fan-worms, ordinary worms, peculiar green flat-shaped worms, plus several other growths as well as about twelve tiny anemones. This is just what we could see on the outside of the rock. What about the inside of the rock? Quite fascinating surely! A miniature reef of these rocks, therefore, boasts numerous varieties of marine life which can provide hours of amusement and interesting study. The rocks also brought into our tank numerous crabs (some of them a nuisance), anemones of various shapes and sizes, and many other odds and ends. The invertebrates blend in beautifully with the rock as well as the fishes. It is fascinating to watch our coral-banded shrimp explore the hundreds of miniature caves created by the living rock when piled up. At night time (and for four months) the tank has teemed with minute creatures which swim through the water and crawl about the glass. Who said using a power filter and ozoniser makes for a sterile tank! It may well remove some of the larger marine life, but certainly not many of the much smaller marine organisms.

During the months that we have had our marine tank set up, about fifteen leaves of the *algae*, *Caulerpa prolifera* have multiplied tenfold and have now covered the whole front and sides of the tank. This has therefore provided the tank with a really dense network of thriving plants which grow more every day. We even find it necessary to prune them!

The pH has been around 8.2 since we set up the tank. The nitrite reading has never been high and during the past couple of weeks it has been virtually negligible.

Our next task was to obtain some live coral and a few other odds and ends. We bought two coral-

banded shrimps, but the next day only one could be seen at first. Later we learnt that, usually, keeping two of these shrimps in a tank is asking for trouble unless they are a proved pair. Unfortunately, the stronger shrimp turned cannibal. This was our first purchase and our first loss. We did not take this setback too badly but this gave us some greatly needed information about what *not* to put into a tank. Our next setback came with our second purchase, a Mantis shrimp. The shrimp quickly burrowed under the layer of sand and could not be seen for a while. We put four tube worms into the tank at the same time. These were very large brownish specimens, except for a small red tube worm. We did not have them in the tank for more than a few minutes when the Mantis shrimp suddenly appeared and dragged the red tube worm into a "cave." It then made large snapping noises and that was the last we saw of this tube worm.

We realised that the shrimp had made an expensive meal of it! We also placed in the tank four live *Goniopora stokesi*, one of which was a brownish, yellow colour and had long polyps; one similar coral, but in white; one again similar but brown; and the fourth coral was a very small piece of *Goniopora* (yellowish purple) which looked very pretty. Another item we added to the tank was a red rock which housed about thirty small (1 in.) yellow anemones. At the same time we acquired a small two-inch iridescent blue clam and a very large hermit crab. Our final choice consisted of three pieces of coral, heavily encrusted with serpulids of various beautiful colours (orange, purple, blue, red, black, white, brown, etc.).

After a day or so we had problems again. The Mantis shrimp was making large holes in the sand and the pretty *Goniopora* coral was looking very pale. We decided to remove the Mantis shrimp and take it back to the shop. We managed this quite easily with a net. We also decided to remove the small piece of *Goniopora* coral as we could see that it was definitely dying. This was rather a disappointing start to our marine hobby. However, everything from then on settled down and the tank looked really beautiful even with the absence of a dreadful Mantis shrimp, a beautiful red tube worm and a withered piece of *Goniopora*. The living rock did its job in keeping the water crystal-clear and keeping the nitrite reading low. The plants in the tank (*Caulerpa prolifera*) were growing rapidly even after only four days of putting them in the tank. I am sure that the Hilena Integral helped with this. Another setback took place when the 5-in. hermit crab we had in the tank began to be destructive. It would eat away some of the very useful *algae*. Luckily we saw this before it could do any damage. We thought it necessary to take it out and return it to the shop from which we bought it. My father got as far as lifting it out of the tank to put it into a polythene bag when suddenly it became aware



of what was going on. It liked its home too much, perhaps? It neatly placed one of its large pincers round his little finger and squeezed very hard. This gave him a terrible fright and he jerked his hand up very quickly—just as someone might do if they had touched something very hot. The poor crab, at this sudden movement, found its grip too loose to keep hold of my father's fingers, and unfortunately hurtled to the hard floor to meet its doom, for its shell was not strong enough to save it.

After the tank had remained in a healthy condition for a couple of weeks, we decided to look around for some fishes, and one or two other odds and ends. We bought a superb specimen of *Coris angulata*, the twin-spotted Wrasse. We also bought a small, pretty tomato clownfish. The Wrasse settled down beautifully, exploring all the living rock which he enjoyed pecking at. He was only a couple of inches long when we bought him so he could not do any damage in the tank. The clownfish, however, did not settle down very well, and although there was no sign of any illness it refused to move from the top part of the tank.

At the same time we bought a flame scallop which added colour to the tank. Another new item was a super, tiny orange and white clown shrimp which we bought, along with a largish white *Radianthus* anemone. Our final choice was a brown *Discosoma* anemone. It is quite large and has hundreds of little round tentacles which stick to anything they touch. Along with this we bought an anemone crab—which has now become so tame that it will take food from one's fingers.

The only trouble with the tank was that it was getting a fraction dirty because at this time we were using the natural system (apart from an ozoniser being used at about 3 m.g. Oz./h). We made enquiries about this and we were told to immediately use a power filter, otherwise the living corals would not survive for more than three months. This we did several months ago and we are grateful for this information. We asked if a power filter would destroy any vital plankton and were told that it would only take out a minute amount because the filter material is not that fine; in fact it is possible to see small hydroids, anemones and worms living in the filter. The living corals have bloomed for months now and have certainly not been starved by this system. Unfortunately, before we put the power filter to use, our clam and flame scallop shrivelled up and died. This was very disappointing but it could only be put down to the fact that the seawater was too new for them. Straughan states in his excellent book, "The Salt Water Aquarium in the Home," that: ". . . they must be watched closely and if they fail to blossom forth, they should be quickly removed from the aquarium. They are not recommended in an aquarium with expensive hard-to-replace specimens

because of the danger of pollution if they are unnoticed in the aquarium."

Feeding has up to now consisted of several foods: whiteworm, garden worm, packeted prawn (which we later learnt might contain a dye processed with copper and so we stopped using this), frozen mysis shrimp, frozen plankton, dry flake food, ten drops of Liquify every day and finally five drops of "Hilena" vitamin solution. We also add five drops of trace element solution each week. We do, however, give the tank a regular supply of brine shrimps (live) and this we feel is vital for the overall health of the tank. It is interesting to watch the way the yellow anemones catch them and feed them carefully into their mouths. The two fish also went mad for them. The brine shrimps feed a variety of life in the tank and therefore we have to have a continual supply of them available. In fact, what we do is to put one-half of a tube of brine shrimp eggs into a bottle (slightly bigger than a milk bottle) containing a brine solution and then vigorously aerate the water. We use one tablespoon of King British salt for each bottle and find that this is fine. We keep the bottle at about 78°F. by standing it in a small heated tank. After about forty hours the contents of the bottle are poured into a Hydro brine shrimp hatcher bowl and the shrimps swim into the centre of it when a light is placed above the bowl. They can then be scooped out in a small sieve-like container. This might sound like a long complicated process but in fact it only takes about five minutes to do. We do not give the brine shrimps any food, but they still last for two days during which time another load of eggs is hatching, thus giving a continuous supply.

We feel that the tank is given a perfectly adequate supply of food—on top of the micro and macro plankton in the water.

Our next addition to the tank was a beautiful orange-coloured piece of coral (*Tubastrea*). Unfortunately the bright golden yellow polyps only came out at night-time.

The tank was about six weeks old and still maturing. During this time we added a few more pieces of living rock around the tank.

Our brown (sticky) anemone wandered around the tank for several weeks—until it found a suitable place for it to anchor itself, just next to a stream of air bubbles. The large white anemone had to be moved because it seemed to be disappearing down the back of the tank. It has now remained in the same place for about two months.

They are fed once a week with a whole frozen shrimp. The shrimps we now use are completely free of any coloration and are only meant for use in aquaria. The white anemone needs to be prodded to get it to eat the shrimp which is placed in its tentacles. It is fascinating to watch the way it feeds. The brown

*discosoma* anemone is a pig! It will eat so much food that it has to be rationed. The tentacles are so powerful that if a live shrimp is placed on them, it will die almost instantly and could not possibly be pulled from the clutches of the anemone. The clown fish, only, like this anemone, as does the anemone crab.

Perhaps we had been too ambitious at first expecting the bivalves to thrive, but nevertheless the tank was not polluted by any of the deaths because the nitrite reading never went up very high. *Algae*, both brown and green, were growing on the back of the tank, and the front and sides had to be periodically wiped with an *Algae Magnet*. The plant growth was now beginning to overrun the tank, it was so healthy.

Everything was going fine for the next two weeks

back to normal. Later that week we made a five-gallon water change. We placed one Hilena Integral tablet in the new water which we aerated and left standing for several days. We again let the tank have a resting stage before making a few small alterations and adding a few other "bits and pieces." As the clown fish still seemed unhappy, we returned it to the shop and changed it for two anemone clowns. These clowns are black and orange with vivid white stripes. One is an African Clown fish, and the other a Ceylon Clown. They love to roll about in the brown sticky anemone, and whenever they are frightened of something they dash into the centre of this beautiful anemone. At night-time they go to sleep in this anemone. While we feed the clowns, they occasionally take a piece of shrimp to their



Section of Marine Tank described.

Photo: D. Rose.

and the tank was looking superb; but I suddenly realised that a rock anemone was missing. I looked and looked but could not find it. I presumed it had gone round the back of the tank into a small cave or something. It was lost for about five days, until I noticed a pinkish "blob" at the bottom of the tank. I took this out of the tank and smelt it. It was absolutely putrid! It must have been dead for about four days. We took a nitrite reading, but luckily it was not much higher than usual. Probably the ozone, power filtration and the numerous filter-feeding life had helped to combat this. The anemone was originally about two-and-a-half inches wide so it could not have done much harm—particularly as the tank was fairly large anyway.

Within the next few days the nitrite reading went

anemone and place it on its tentacles. It then quickly eats it—unless the anemone crab sees it first! If he does see it first, he scuttles over to it and tries his hardest to pull it out of the tentacles and eat it himself. Often the anemone's grip would prove too strong for him to succeed in eating it. During this comical "fight" the anemone would tilt and revolve in order to make things pretty hard for the crab. When no food is about, the crab, fish and anemone get on fine. The fish have even tried to take bits of shrimp from the crab but he has managed to fight them off with very little violence. In a way this scene is hilarious. It is difficult to imagine a fight between an anemone, an anemone crab, and two clownfish over a piece of shrimp.

After the tank had been established for about two

months, we added a superb large ochre-coloured tube worm. Like the other tube worms, it goes in and out of its tube at various intervals. When it comes out of the tube, it blooms just like a flower would, only in slow motion. We also bought two banded pipefish which glided round the tank really gracefully. The tank looked more beautiful than ever, especially since the plant growth was beyond all our wildest expectations, and all the other life was in the best of health.

Then the next week a tragedy took place. The brown "sticky" anemone had killed one of the pipefish. We presume the pipefish must have just touched the anemone and, being so powerful, it gave the fish no chance to escape. We know the anemone was the culprit because we saw the pipefish's tail sticking out of the anemone's maw!

Another bit of bad luck came when the piece of bright orange living coral began to die and we had to remove it. Later we learnt that this type of coral can be fairly tricky. Being beginners at the marine side of the hobby, we were not too disappointed at the deaths in the tank because we could only learn by experience. All the other live corals that we had bought were in excellent health, although the brown yellow (*Goniopora stokesi*) had fallen over in the tank and had been slightly damaged.

By now the Wrasse had grown about an inch-and-a-half longer and it was on the verge of getting too destructive in that it was pecking at the living rock and sometimes chipping tiny pieces off it. We therefore took it back to the shop and exchanged it for a beautiful piece of *pyrogyna*. This coral has longish brown polyps with white tips. We also acquired a green crinoid, a truly fascinating creature. The Crinoid used to wave its arms all over the place and often wander around the tank. I say "used to" because unfortunately, after having bought it, we found out that usually they only live for about four months. Ours did just that!

The only disappointment with the tank has been the way two or three of our small 3 in.-4 in. anemones (not mentioned previously) have had a hole bitten through their trunks. It might be some of the crabs in the tank; but an expert said it could be the change in water conditions causing a rupture in the anemone's skin. We have never seen any of our crabs attack an anemone but we still are not completely sure that they are *not* to blame. Perhaps one day we will find out!

Our latest fish have been two damselfish (one saffron-blue damsel and one electric blue damsel) and two yellow seahorses (a bad mistake!). The colours of the damselfish are startling. They are too well known to need description but they would enhance any tank. The two damselfish get on fine and occupy the same cave together, keeping well away from the clownfish. They are the simplest fish to feed, and thrive on all varieties of food. It was only

on adding these blue fish that we discovered what we were missing. They have shown no spitefulness yet, and do not attempt to disrupt any of the living rocks or corals. Even though we have not kept them long enough to make any sweeping statements, I must say that so far, along with the clownfish and pipefish, they have proved perfect fish for this type of set-up, as long as they are kept in singles (i.e., one of each species).

The seahorses were a different kettle of fish altogether. Although they were fascinating and completely harmless, they were not (we have been very reliably told) under any circumstances community fish. We only found this out *after* we had bought them. They only stayed with us for a couple of days because they refused to eat with any other fish in the tank. During their brief stay with us, they attached themselves to pieces of living rock by curling their tails round a bit of it. We should have learnt more about them before buying them for their own sake. I would imagine that thousands of seahorses have died because of insufficient knowledge of their requirements.

After the addition of the fishes, we bought a superb white anemone with yellow tips and a bright pinky/mauve base. It seemed to want to wander around the left-hand side of the tank during its stay with us. Unfortunately it had to go back because it was not happy in our tank.

While looking at the tank with a powerful torchlight at night-time, we saw a weird "thing" slowly disappear into a piece of living rock. It looked rather like the skin of a squid but that was as much as we could see. Perhaps it was some sort of sea-slug. Another strange creature was a dark black worm, with whitish bands, that folded into itself when light was shone near it. We also saw numerous crabs, including a crab that held a couple of anemones in its claws. We were advised to remove some of the larger crabs from our tank in case they might have done some damage. We took out about four crabs, even though we never saw them damaging anything. We never missed them because they only came out at night-time. We did not intentionally buy them; they came in the living rock.

We recently acquired two beautiful tube worms. One was pure white and the other was a purplish-coloured one. They brighten up a would-be dull corner of the tank. At the same time we bought a very small piece of *pyrogyna* coral which was also pure white. This is very attractive since it is not too bulky and is only a couple of inches long.

An animal that often gets neglected in our tank is a pretty pink and yellow sea cucumber. It seems to enjoy its life in our tank and has found itself an algae-covered part of the tank which it has adhered to for well over two months. It is no more than three inches long and so it is not surprising that few people

notice it. When they eventually spot it, they say, "Is that a sausage or something?" Then, on closer inspection, they are baffled when they see one end of it gradually open up to reveal a few branch-like tentacles which mechanically wave in the water and then one by one move into the open mouth of the cucumber. The cucumber then commences to close its mouth around the tentacle and pull it out to wave it in the water again, while another tentacle performs the same actions—like a little baby sucking its fingers clean!

About a month ago we bought a white *discosoma* anemone. Although it is not at all sticky, it responds very well to being fed with frozen shrimp—as long as the clownfish do not take it and give it to their old favourite, the brown *discosoma*. At the same time we bought a very good piece of living rock that had numerous plants, algae, serpulids, anemones, sponges and worms on and in it. This was very well suited to fill a corner of the aquarium. Our latest acquisitions have consisted of a dark brown tube worm with white markings on it and a very large piece of *Porites* coral containing five enormous serpulids, two small ones and several fan worms. Apart from the damsels we also recently acquired a Mandarin fish—an excellent scavenger—and a Cleaner Wrasse which is full of life.

The success and enjoyment given to us by the tank far outweigh any of the setbacks which have taken place during the tank's existence. It has provided endless amusement and interest, besides being of great educational value as regards marine biology. I can see that this hobby will soon equal the freshwater tropical side of the hobby when people find out that *with some care* a reef can be brought into their home.

Keeping a marine aquarium, as stated so many times, can never be a replica of sea conditions, but with care and attention it will thrive and look superb. Our tank looks just like a miniature reef, even though

the currents, life and water conditions, etc., would probably be very different in the sea.

So far we have kept all our very early corals alive for over six months. Surely this must prove that they can survive in such a tank in very good health. They show no signs whatsoever of deteriorating, and "bloom" beyond belief when the lights are on.

The main trouble with a marine tank is the expense involved. However, one day, as was the case with cardinal and neon tetras, the invertebrates might cost about half the price they do now.

The tank, we have been told, looks as near to nature as can be expected. The fishes look so healthy that they gleam. They have no blemishes whatsoever.

No doubt the tank will slowly change as all tanks do, but with care and attention it should still remain in excellent health.

We feel that using only power filtration and ozonised air bubbles is an excellent method of keeping seafish. The results that we have obtained are conclusive evidence that our system is very successful and that we are at the same time removing the dirt from the tank. The lights that we have used also have been very successful in encouraging the growth of the plants, and the salt has proved excellent.

I would like to thank the following people for their invaluable help, without which the tank would never look as well as it does now. Their excellent knowledge and advice has certainly been appreciated by my father and me. First, Richard Sankey of "The Tropical Marine Centre," secondly, John Adams of "The Ark" Aquatic Centre, and last but not least, Brian Jones of "Allpets."

Let's hope that this side of the hobby will expand and prove as popular as are tropical freshwater fishes. It certainly should!



#### ADVANCE NOTICE

THE FEDERATION OF SCOTTISH AQUARIST SOCIETIES  
are happy to announce

### THE 2nd SCOTTISH AQUARISTS' FESTIVAL

will be held at the CIVIC CENTRE, MOTHERWELL near GLASGOW

on

SATURDAY AND SUNDAY - 13th, 14th APRIL, 1974

FURTHER DETAILS SHORTLY



## from AQUARISTS' SOCIETIES

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

**RESULTS of the Castleford A.S. open show** were as follows: Guppies: 1, 2 and 3, Mr. and Mrs. Smith (Castleford). Platies: 1, L. Mustcroft (Thorne); 2, Mr. and Mrs. Buxton (Aireborough); Swordtails: 1, S. Clark (Aireborough); 2, D. Arden (Doncaster); 3, J. S. Hall (Aireborough). Mollies: 1, Mr. and Mrs. Asquith (Castleford); 2, Mr. Brown (Scunthorpe); 3, Mr. and Mrs. Stephens (Pontefract). A.O.V. Livebearers: 1, J. A. Whiteley (Aireborough); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Daines (Doncaster). Small Characins: 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. Cartwright (Huddersfield); 3, M. E. Hall (Swillington). Large Characins: 1, J. A. Whiteley (Aireborough); 2, Mr. and Mrs. Daines (Doncaster); 3, Mrs. P. Hislop (Swillington). Sharks and Foxes: 1, J. S. Hall (Aireborough); 2, Mrs. Wales (South Leeds); 3, Mrs. Spavin (South Leeds). Rasbora, Danios and Minnows: 1, Mr. and Mrs. Wells (Doncaster); 2, M. E. Hall (Swillington); 3, G. Malpas (Castleford). Small Barbs: 1, Mr. and Mrs. Dickinson (Pontefract); 2, Mr. and Mrs. Blades (Cresswell); 3, D. and P. Birdhall (Aireborough). Large Barbs: 1, Mr. and Mrs. Cohen (Pontefract); 2, T. Smith (Sheffield); 3, Mr. and Mrs. Buxton (Aireborough). Dwarf Cichlids: 1, H. Khams, (Lincoln); 2, Mr. and Mrs. Blades (Cresswell); 3, J. A. Whiteley (Aireborough). Large Cichlids: 1, D. Gilding (Gainsborough); 2 and 3, Mr. and Mrs. Daines (Cresswell). Angels: 1, Mr. and Mrs. Dixon (Gainsborough); 2, G. Ibbotson (Keighley); 3, Mr. and Mrs. Smith (Sheffield). Corydoras: 1, Mr. and Mrs. Wells (Doncaster); 2 and 3, Mr. and Mrs. Hartwood, A.O.V. Catfish: 1, J. Beavers (Hartlepool); 2, Mr. and Mrs. Buer (Scunthorpe); 3, K. Barrett (Castleford). Loaches: 1, Mr. and Mrs. Norris (East Lancs); 2, Mr. and Mrs. Buxton (Aireborough); 3, G. Ibbotson (Doncaster). Small Anabantids: 1, Mr. and Mrs. Cohen (Pontefract); 2, S. Clarke (Aireborough); 3, D. Hudson (Keighley). A.O.V. Anabantids: 1, Mr. and Mrs. Cohen (Pontefract); 2, K. D. W. Edwards (Castleford); 3, Leeds G.P.O. Fighters: 1, A. Curchin (Castleford); 2, S. Clarke (Aireborough); 3, J. Beavers (Hartlepool). Toothcups: 1, Mr. and Mrs. Smith (Castleford); 2, F. Sonley (B.K.A.). A.O.V. Tropical: 1, Mr. and Mrs. Shipman (Grantham); 2, J. S. Hall (Aireborough); 3, J. A. Whiteley (Aireborough). Breeders (Livebearers): 1, W. Blundell (Doncaster); 2, Master Furness (C.A.S.); 3, Mrs. P. Hislop (Swillington). Breeders (Egglayers): 1, D. Gilding (Gainsborough); 2, F. Sonley (B.K.A.); 3, Mr. and Mrs. Wells (Doncaster). Pairs (Livebearers): 1, D. and P. Birdhall (Aireborough); 2, W. Blundell (Doncaster); 3, A. Curchin (Castleford). Pairs (Egglayers): 1, Mr. and Mrs. Gates (Pontefract); 2, Mr. and Mrs. Wells (Doncaster); 3, Mr. and Mrs. Daines (Doncaster). Ladies A.O.V.: 1, Mrs. Hall (Aireborough); 2, Mrs. Copley (Doncaster); 3, Mrs. B. Clarke (Aireborough). Junior A.O.V.: 1, Miss L. Shipman (Grantham); 2, G. Maguire (Hartlepool); 3, Susan Clarke (Aireborough). A.V. Female Livebearers: 1, J. S. Hall (Aireborough); 2, G. Ibbotson (Keighley); 3, K. Barrett (Doncaster). A.V. Female Egglayers: 1, Mr. and Mrs. Fletcher (Doncaster); 2, D. Arden (Doncaster); 3, Mr. and Mrs. Daine (Doncaster). Common

Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Fancy Goldwater: 1, 2 and 3, J. S. Hall (Aireborough). A.O.V. Goldwater: 1 and 2, J. S. Hall (Aireborough); 3, P. Haynes (Castleford). There were 568 entries from 23 societies.

**OVER 400 entries** were received for the **Irish Tropical Fish Society's Annual Open Show**. Results: Best Fish in Show, W. Pollock (Belfast). Furnished Aquaria: 1 and 2, S. Mooney (Portmarnock); 3, T. Savage (Dublin); 4, P. Nainmith (Dublin). Barbs: 1, B. Walsh (Dublin); 2, Mrs. T. Brennan (Dublin); 3, S. Mooney (Portmarnock); 4, P. Byrne (Dublin). Characins: 1, R. A. Davis (Dublin); 2, W. I. Pollock (Belfast); 3, H. Kolbe (Dublin); 4, D. Byrns. Cichlids: 1, D. M. Frater (Belfast); 2, J. Russell (Tallaght); 3, D. H. Wright (Bray); 4, S. Mooney (Portmarnock). Labyrinth: 1, E. McQuade (Ontario); 2, Mrs. T. Brennan (Dublin); 3, S. McNaughton (Blackrock); 4, D. Bryans. Egg-laying Tooth Carps: W. I. Pollock (Belfast); 2, J. Russell (Tallaght); 3, D. Bulger (Dublin); 4, D. Bryans. Catfish and Loaches: 1, P. Byrne (Dublin); 2, D. M. Frater; 3, L. Pattison (Dun Laoghaire); 4, D. M. Frater. Rasboras: 1 and 2, W. I. Pollock (Belfast); 3, P. Nainmith (Dublin); 4, H. Kolbe (Dublin). A.V. Pairs: 1, G. Smith; 2, H. Dunn (Belfast); 3, D. M. Frater; 4, H. Kolbe (Dublin). Guppy: 1 and 2, K. Norton (Dublin); 3, G. Goult (Bangor); 4, Mrs. A. Kennan (Dublin). Swordtails: 1 and 2, D. Bryans; 3, Mrs. A. Kennan (Dublin); 4, D. Moran. Platys: D. Bulger (Dublin); 2 and 4, M. Cassidy (Dublin); 3, D. Hughes (Dublin). Mollies: 1, 2 and 3, S. Mooney (Portmarnock); 4, G. Smith. A.O.V. Egglayer: 1, P. Byrne (Dublin); 2, L. Pattison (Dun Laoghaire); 3, P. G. O'Sullivan (Dublin); 4, D. M. Frater. Singletail Goldfish: 1, S. McNaughton (Blackrock); 2 and 3, J. Dunne (Dublin); 4, B. Palmer (Dublin). Twinstail Goldfish: 1, J. Dunne (Dublin); 2, G. McCaffrey (Dublin); 3, K. Norton (Dublin); 4, A. Lloyd (Dublin). Breeders: 1 and 2, H. Kolbe (Dublin); 3, L. Pattison (Dun Laoghaire); 4, W. I. Pollock (Belfast). Marine: 1, Miss M. Bruton; 2, J. O'Shea (Dublin); 3, S. Mooney (Portmarnock); 4, D. H. Wright. A.V. Plants: 1, W. L. Pollock (Belfast); 2, S. Cooke (Dublin); 3, L. Pattison (Dun Laoghaire); 4, D. H. Wright. B.A.S. Inter Club Award 1, I.T.F.S. 2, B.A.S.

A record number of 707 entries from 32 Societies gave **Barnsley T.F.S.** their best show performance. Results: Guppies: 1, Mr. and Mrs. Marshallisa (B.K.A.); Section winner; 2, L. Smith (Castleford); 3, M. and D. Laycock (Sheffield). Platies: 1, J. S. Hall (Aireborough); 2, Mr. and Mrs. Cohen (Pontefract); 3, F. Buxton (Aireborough). Swordtails: 1, G. Ibbotson (Keighley); 2, J. S. Hall (Aireborough); 3, E. Kirk and son (Humblyside). Mollies: 1 and 3, Mr. Brown (Scunthorpe); 2, J. S. Hall (Aireborough). A.O.V. Livebearer: 1, Mr. and Mrs. Marshallisa (B.K.A.); 2 and 3, Mr. and Mrs. Toyne (Sheaf Valley). A.O.V. Characins: 1, B. Wheelan (Blackburn); 2, D. Kennedy (Keighley); 3, Mr. and Mrs. Gabe (Chesterfield). Small Characins: 1, Mr. and Mrs. Norton (Humblyside) Section winner; 2,

Mr. and Mrs. Cohen (Pontefract); 3, L. Smith (Castleford). Dwarf Cichlids: 1, Mr. and Mrs. Blades (Cresswell); 2, G. Thickbroom (Castleford); 3, Mr. and Mrs. Toyne (Sheaf Valley). Angels: 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, Mrs. J. Kirk (Humblyside); 3, Mr. Axon (Ashton). A.O.V. Cichlids: 1, Mr. and Mrs. Blades (Cresswell) Section winner; 2, Mr. and Mrs. Buxton (Aireborough); 3, Mr. Reed (Workshop). Small Barbs: 1, Mr. and Mrs. J. Dickinson (Pontefract) Section winner; 2, Mr. and Mrs. Birdhall (Aireborough); 3, Miss J. Gullane (Buxton). A.O.V. Barbs: 1, A. Freasy (Doncaster); 2, T. Smith (Sheffield); 3, J. Dunn (Horsforth). Corydoras: 1 and 3, M. Clark (Buxton); 2, Mr. Gillespie (Castleford). Loaches: 1, Mr. Marshallisa (B.K.A.) Section winner; 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, Mr. and Mrs. Binns (Scunthorpe). A.O.V. Catfish: Miss J. Gullane (Buxton); 2, J. S. Hall (Aireborough); 3, Mr. Gillespie (Castleford). Siamese Fighters: 1, Miss S. Clarke (Aireborough); 2, Mr. and Mrs. Cohen (Pontefract); 3, Mr. Gillespie (Castleford). A.O.V. Anabantids: 1, Mr. Gillespie (Castleford) Section winner; 2, Mr. and Mrs. Cohen (Pontefract); 3, Miss S. Clarke (Aireborough). Danios: Rasbora and Minnow: 1, T. Smith (Sheffield); 2, Mr. and Mrs. Tomlinson (Chesterfield); 3, Mr. and Mrs. Wells (Doncaster). Sharks and Flying Foxes: 1, J. S. Hall (Aireborough) Section winner; 2 and 3, W. Blundell (Doncaster). Top Spawning Killifish: 1, L. Smith (Castleford) Section winner; 2, Simpson and Horsfield (Barnsley); 3, Mr. and Mrs. Marshallisa (B.K.A.). Bottom Spawning Killifish: 1, Mr. and Mrs. Marshallisa (B.K.A.); 2, T. Smith (Sheffield); 3, M. Carr (Doncaster). Breeders (Egglayers): 1 and 3, Mr. Reed (Workshop) Section winner; 2, Mr. and Mrs. Wells (Doncaster). Breeders (Livebearers): 1, Mr. and Mrs. Toyne (Sheaf Valley) Section winner; 2, Miss S. Clarke (Aireborough); 3, W. Blundell (Doncaster). Pairs (Egglayers): 1, Mr. and Mrs. Wells (Doncaster) Section winner; 2, Mr. Reed (Workshop); 3, Mr. and Mrs. Parkes (Sheffield). Pairs (Livebearers): 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, Mr. and Mrs. Wells (Doncaster); 3, Mr. and Mrs. Birdhall (Aireborough). A.O.V. Tropical: 1, J. S. Hall (Aireborough) Section winner; 2, Mr. and Mrs. Buer (Scunthorpe); 3, Mr. and Mrs. Simpson (Workshop). Common Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). A.O.V. Goldwater: 1 and 2, J. S. Hall (Aireborough) Section winner; 3, M. Clark (Buxton). Juniors A.V.: Masters K. and N. Parkes (Sheffield); 2, Miss D. J. Perkins (Workshop); 3, Master R. Platts (Barnsley). Ladies A.V.: 1, Mrs. Hall (Aireborough) Section winner; 2, Mrs. C. Wheelan (Blackburn); 3, Mrs. Copley (Doncaster). Marine A.V.: 1, Master S. Rhodes (Four Star) Section winner; 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. D. Caldwell (Scunthorpe). The Best Fish in Show Trophy and the Aquarist Gold Pin, was won by a Guppy shown by Mr. and Mrs. Marshallisa of the B.K.A.

AN interesting illustrated talk on Catfish by Mr. D. Noble was enjoyed by members of the **Bishops Cleeve A.S.** in July. A slide show by Mr. M. Bishop was given in August, and a Quiz drawn up by Mr. T. Evans was the main item in September.

THE September meeting of the **Ilford and District Aquarists' and Pondkeepers' Society** included a lecture by Mr. Roger Edwards, who gave an interesting talk and practical demonstration on the D.I.Y. manufacture of fibre glass fish ponds, and fibre glass

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in general. The monthly table show competitions were won by the following members: Male Guppy: 1, J. Rendal; 2, C. Irish; 3, P. Barham. Female Guppy: 1, P. Barham; 2 and 3, C. Irish. Shubunkin: 1 and 2, H. Berger.

THE meeting in September of the **British Marine Aquarists Association** West Midland Group was the most eventful for some time and most members had much to say about their holidays and about the native marines available at our own sea shores. It would appear to most members that one of the best spots there is, is at Penzance. The night ended with a fine slide show given by member Brian Floorwood of Dudley.

RESULTS of the C.N.N.A. inter-club zone knockout contest between **Barry A.S.** and **Llanrwit Major A.S.** were as follows: A.O.V. Livebearers: 1 and 2, K. Thomas (Barry); 3, M. Guthrie (Barry); 4, G. Fry (Llanrwit Major). A.O.V. Egg-layers: 1, Mr. Glover (Llanrwit Major); 2, D. Wigg (Llanrwit Major); 3, M. Guthrie (Barry); 4, T. Jordan (Barry). Best Fish Award Mr. Glover. Highest pointed member in Barry Club Award K. Thomas. Remaining jars, judged separately in two classes as follows. A.O.V. Livebearers: 1, M. Harvey (Llanrwit Major); 2, T. Jordan (Barry); 3, B. Bendell (Barry); 4, A. Wallace (Barry). A.O.V. Egg-layers: 1, Mr. Thompson (Llanrwit Major); 2 and 4, S. Nelson (Llanrwit Major); 3, K. Thomas (Barry). F.B.A.S. Judges C. Harding, M. Gorwill and J. Jordan. Barry A.S. won the contest 12 points to 8 points.

MORE than 470 tropical and coldwater fish were on view to the public at the **Hounslow and District A.S.** Annual open show. Best fish in the show was won by D. Lambourne of Roehampton who is well known in aquarist circles for his fine collection of catfish and his skill in breeding these rather difficult species. The show was run according to F.B.A.S. rules and the following F.B.A.S. judges officiated, H. Towell, E. Nicoll, M. Carter, A. Blake, R. Esson, R. Gieger, J. Jeffrey, R. Liar and Mrs. P. Baynton. Awards: Class AG: 1, Mrs. Jackson. Class BA: 1, Mrs. Coyle; 2, Miss Thomson; 3, S. Mason. Class BZ: 1, S. Mason; 2 and 3, R. Leslie. Class CA: 1, D. Reilly; 2, Miss Coyle; 3, M. Strange. Class CZ: 1, A. Rigby; 2, Mrs. Coyle; 3, C. Mears. Class DB: 1, 2 and 3, S. Bassoon. Class DZ: 1, J. Batts; 2, D. Haines; 3, K. Rees. Class EA: 1, R. Bowes; 2, L. McQuade; 3, A. Hall. Class EZ: 1, Mr. and Mrs. Parish; 2, Mrs. Coyle; 3, A. P. Taylor. Class FCDEF: 1, M. Collins; 2, M. Alexander; 3, D. Brookes. Class FZ: 1, K. Usher; 2, I. Clark; 3, A. Constantine. Class G: 1, D. Lambourne; 2, I. Clark; 3, A. Constantine. Class H: 1 and 3, J. Batts; 2, J. M. Sheppard. Class J: 1, S. Mason; 2, J. Scollery; 3, C. White. Class K: 1 and 2, R. Pook; 3, T. Taylor. Class L: 1, R. Leslie; 2, A. P. Taylor; 3, D. Reilly. Class NBT: 1, R. Leslie; 2 and 3, I. Clark. Class O: 1, S. M. Dattley; 2, A. P. Taylor; 3, T. Riley. Class P: 1, Mrs. S. Canning; 2, A. Hall; 3, S. Freemantle. Class Q: 1, I. R. Pierce; 2, K. Usher; 3, M. Chapman. Class R: 1, M. Chapman; 2, M. Cott; 3, C. Turner. Class S: 1, M. Dear; 2, A. Constantine; 3, B. Turner. Class T: 1, V. E. Valley; 2, K. Usher; 3, E.C. Panthem. Class U A+B: 1, E. Ploder; 2, K. Usher; 3, E. C. Panthem. Class U C+D: 1, and 3, J. Greaves; 2, Mrs. Longstaff. Class V: 1 and 3, Mrs. Longstaff; 2, Mrs. Pinder. Class WAOS: 1, Mrs. Longstaff; 2, A. Heath; 3, C. Mears. Class XBM: 1, D. Lyne; 2 and 3, R.

Pook. Class NOT: 1 and 2, K. Usher; 3, A. J. Smith. Specialists Class: 1, D. Lambourne; 2, B. Bassoon; 3, R. Leslie. Perpetual Trophies: Best fish in show; D. Lambourne. Best Specialist Team: D. Lambourne. Best Labyrinth: Mrs. S. Parish. Best Barb: S. Mason. Best Livebearer: I. R. Pierce. Best Breeders: D. Lyne. Best Coldwater: Mrs. Longstaff. Best Guppy: S. M. Bayly. Best Tropical Shark: H. S. Pratt. Best Killifish: M. Collins. Best Characin: A. S. Rigby. Best Rift Valley Cichlid: D. Haines. Inter-club Shield **HOUNSLOW**. The organisation of this very successful event was in the capable hands of Show Manager Mr. E. Sheppard who has many years experience of fish shows. Anyone wishing to obtain further information about this interesting hobby is welcome to attend the meetings which are held on alternate Wednesdays at St. Stephens Church Hall, Whitton Road, Hounslow at 8 p.m. All enquiries to the Secretary Mr. H. Parish, 18 The Barrons, Twickenham.

THOSE elected at the **Kettering A.S.** annual meeting were: Chairman S. Sykes, Vice Chairman Mrs. B. Jeffers; Secretary, T. Tillin, 48, Silverwood Road, Kettering, Northants., NN15 6BH. Treasurer S. Tine. After the meeting J. Phillips presented trophies for the year's activities. Junior member of the year was K. Taylor. Club member and Fishkeeper of the year K. Tillin. External Cup (for entering open shows, etc.) K. Tillin.

RECENTLY the **Hastings and St Leonards A.S.** heard Mr. Richard Sankey talk on Marines. Over fifty members attended to hear him although there are only two members who actually keep marines. Mr. Sankey is associated with the Tropical Marine Centre at Kingsbury. He devoted his talk to his own personal experiences in a collecting tour extending from the Red Sea to the Great Barrier Reef, and the Caribbean Islands. He discussed the lighting, filtration and feeding of the fishes. The table show for Mollies was judged by H. Carey and was won by Mrs. J. French. At the second monthly meeting Mr. D. Jolliffe of the Beshill A.S. announced the winners of the garden ponds competition which he had judged earlier in the year. The placings were: 1, Mrs. Q. Pollard; 2, C. Reed; 3, A. L. McCormick. At the same meeting Mrs. Christine French from Warbeton gave the results on the Home Aquaria Competition. As with the garden ponds, members were disappointed that owing to the Kodak dispute no slides were available to illustrate the winning entries, which were: 1, Mrs. E. Reed; 2, C. Pannel; 3, H. Carey. Best Junior: Andrew Reed. Best Plants: Mrs. E. Reed. H. Carey substituted by showing slides which he took, when the Society visited the Interpret establishment at Dorking. The Tableshow, which was Characins was judged by Mrs. French, the winner being C. Pannel.

RESULTS of the seventh **Cardiff A.S.** open show were as follows: Class B: 1 and 3, W. Limbrick (Llanrwit Major); 2, Mr. and Mrs. C. Harding (Cardiff); 4, D. Warrneant (Cardiff). Class C: 1 and 3, Mr. and Mrs. C. Harding (Cardiff); 2, W. Gorwill (Cardiff); 4, F. Sutherland (Basingstoke). Class Ca: 1, M. Strange (Basingstoke); 2 and 3, D. Scanlon (Cardiff); 4, S. Savage (Port Talbot). Class D: 1, W. Gibbon (Newport); 2, S. Compton (Cardiff); 3, J. Edwards (Llanrwit Major); 4, W. Gorwill (Cardiff). Class Da: 1, J. J. Edwards (Llanrwit Major); 2, S. Burt (Rhondda); 3, M. Strange (Basingstoke); 4, D. Warrneant (Cardiff); 5, C. Turner (Cardiff); 6, C. Morrison (Port Talbot). Class E: 1, D. Jones (Port Talbot); 2, D. Warrneant (Cardiff); 3, Mr. and Mrs. Johnson (Penarth); 4, J. Edwards (Llanrwit Major). Class Ea: 1 and 2, C. Turner (Cardiff). Class F: 1 and 3, M. Addicott (Newport); 2, Mr. and Mrs. Williams (Rhondda); 4, C. Morrison (Port Talbot). Class G: 1, J. Rice (Port Talbot); 2, W. Gorwill (Cardiff); 3, W. Limbrick (Llanrwit Major); 4, Mr. and Mrs. C. Harding (Cardiff). Class H: 1 and 3, Mr. and Mrs. Williams (Rhondda); 2, R. Wigg

(Llanrwit Major); 4, W. Gorwill (Cardiff). Class I: 1, 2, 3 and 4, M. Lovelless (Penarth). Class J: 1 and 2, Mr. and Mrs. Williams (Rhondda); 3, S. Burt (Rhondda); 4, Mr. and Mrs. C. Harding (Cardiff). Class K: 1 and 2, J. J. Edwards (Llanrwit Major); 3 and 4, A. Click (Rhondda). Class L: 1, P. Boalch (Cardiff); 2 and 3, D. Warrneant (Cardiff); 4, K. Williams (Rhondda). Class M: 1, M. Strange (Basingstoke); 2, R. Daws (Cardiff); 3, J. J. Edwards (Llanrwit Major); 4, P. Thomas (Swansea). Class N: 1, D. Warrneant (Cardiff); 2, Mr. and Mrs. C. Harding (Cardiff); 3, C. Morrison (Port Talbot); 4, P. Boalch (Cardiff). Class O: 1, C. Davies (Port Talbot); 2, W. Gorwill (Cardiff); 3, J. Rice (Port Talbot); 4, R. Wigg (Llanrwit Major). Class P: 1, Mr. and Mrs. Williams (Rhondda); 2, R. Wigg (Llanrwit Major); 3, J. Thomson (Llanrwit Major). Class Q: 1, K. Williams (Rhondda); 2, C. Davies (Port Talbot); 3, W. Gorwill (Cardiff); 4, D. Warrneant (Cardiff). Class R: 1, C. Turner (Cardiff); 2, W. Gibbon (Newport); 3 and 4, D. Warrneant (Cardiff). Class S: 1, D. Scanlon (Cardiff); 2, Mr. and Mrs. C. Harding (Cardiff); 3, P. Glover (Llanrwit Major); 4, J. Thomson (Llanrwit Major). Class T: 1, M. Strange (Basingstoke); 2 and 4, Mr. and Mrs. C. Harding (Cardiff); 3, C. Morrison (Port Talbot). Class U: 1 and 2, Mr. and Mrs. C. Harding (Cardiff); 3 and 4, C. Turner (Cardiff). Class V: 1, D. Warrneant (Cardiff). Class W: 1 and 3, W. Matthews (Tebyay); 2, M. Smith (Rhondda); 4, A. Edwards (Cardiff). Class X-B-M: 1, 3 and 4, Mr. and Mrs. C. Harding (Cardiff); 2, C. Turner (Cardiff). Class X-O-T: 1, M. Strange (Basingstoke); 2 and 3, R. Wigg (Llanrwit Major); 4, Mr. and Mrs. C. Harding (Cardiff). Best Tropical in Show: Master M. Lovelless. Best Coldwater in Show: Mr. and Mrs. C. Harding. Most Points in Show: Mr. and Mrs. C. Harding. Most Points Cardiff Member: Mr. and Mrs. C. Harding.

THE officers elected to serve the **Romford and Beacottree A.S.** for a further twelve months are as follows: Chairman: D. Kent, 74 Lynwood Drive, Collier Row, Romford; secretary: A. Wakenell, 143 Bruce Avenue, Hornchurch; treasurer: F. Victory; show secretary: F. Jacobs, 264 Southend Arterial Road, Hornchurch. Committee members: D. Byfield, C. Reading, P. Hines, W. Baker, K. Iles, R. C. Smith.

THE **Hinckley and District A.S.** held their second open show early in October. Results: A.V. Guppy: 1, R. Clarke (Pelsall); 2, S. Walker (Coventry); 3, C. Pratt (Bedworth); 4, J. Roberts (Hinckley). A.V. Molly: 1, J. Igoe (Sherwood); 2, R. Shakespeare (Bedworth); 3, G. W. Allen (Independent); 4, Mrs. Hall (S.A.S.S.). A.O.V. Livebearer: 1, D. Penwright (G.K.N.); 2, C. Pratt (Bedworth); 3, G. W. Allen (Independent); 4, J. Roberts (Hinckley). Small Characin: 1, J. Salisbury (Bedworth); 2, G. W. Allen (Independent); 3, P. Hickey (Pelsall); 4, S. Breathnach (Gudgers End A.S.). A.O.V. Characin: 1, T. Roberts (North Staffs.); 2 and 4, Mr. and Mrs. Ward (Banbury); 3, D. and H. (Tamworth). Small Barbs: 1 and 4, Mr. and Mrs. Bull (Derby); 2, D. and H. (Tamworth); 3, T. Gould (M.T.A.). A.O.V. Barb: 1, Master P. Barnett (Independent); 2, D. and H. (Tamworth); 3, Mr. Simmons (Coventry); 4, J. Salisbury (Bedworth). Dwarf Cichlid: 1, H. Kuhn (Lincoln); 2, A. Dale (Pelsall); 3, Mr. and Mrs. Ward (Banbury); 4, R. Marshall (Northampton). Angel Fish: 1 and 2, T. Salisbury (Bedworth); 3, Mrs. M. Igoe (Sherwood); 4, G. W. Allen (Independent). A.O.V. Cichlid: 1, R. Shakespeare (Bedworth); 2, G. W. Allen (Independent); 3, G. Coney (G.K.N.); 4, G. Nesbit (Gudgers End A.S.). Siamese Fighter: 1, N. Wood (Gloucester); 2, Mr. and Mrs. Hayes (Hinckley); 3, G. W. Allen (Independent); 4, G. Nesbit (Gudgers End A.S.). A.O.V. Anabantid: 1 and 3, Mrs. Moutin (Hinckley); 2, C. Pratt (Bedworth); 4, G. Coney (G.K.N.). Corydoras and Brochis: 1, L. W. Pool (Banbury); 2, G. Coney (G.K.N.); 3, E. Sandercock (Gudgers End A.S.); 4, D. and H. (Tamworth).

**halamid** A FRACTION A DAY, KEEPS ALGAE AWAY  
Hillside Aquatics London N12

A.O.V. Catfish: 1, C. Pratt (Bedworth); 2, F. Wason (Chesterfield); 3, G. W. Allen (Independent); 4, T. Clark (Hinckley). A.V. Lurch: 1, J. Salisbury (Bedworth); 2, M. Brambridge (Jones and Shipman); 3, Mr. and Mrs. Short (Nuneaton); 4, J. and C. Stanley (S.A.S.S.). A.V. Killie: 1, Mr. Hirst (Coventry); 2, A. and B. Faulkner (Hwyford Select); 3, and 4, T. Clark (Hinckley). A.V. Rasbora: 1, Mr. and Mrs. Bull (Derby); 2, T. Clark (Hinckley); 3, K. Pratt (Bedworth); 4, T. and M. Hughes (S.A.S.S.). Danios and W.G.M.M.: 1, R. Hargreaves (Gudgers End A.S.); 2, T. Saunders (G.K.N.); 3, Master A. Bull (Derby); 4, J. Goodall (S.A.S.S.). Egglayer Pairs: 1, Master P. Barnett (Independent); 2, Mr. and Mrs. Bull (Derby); 3, G. Coney (G.K.N.); 4, Master N. Short (Nuneaton). Livebearer Pairs: 1, G. Nabbet (Gudgers End S.A.); 2, Mr. and Mrs. Ward (Banbury); 3, R. Shakespear (Bedworth); 4, R. Onslow (Basingstoke). Egglayer Broods: 1, Mr. Hirst (Coventry); 2, J. Salisbury (Bedworth); 3, Mrs. Hall (S.A.S.S.); 4, T. Salisbury (Bedworth). Livebearer Broods: 1, J. Igoe (Sherwood); 2, Mr. Hirst (Coventry); 3, Master S. Walker (Independent); 4, R. Onslow (Basingstoke). A.O.V. Tropical: 1, D. and H. Tamworth; 2, J. Salisbury (Bedworth); 3, T. and M. Hughes (S.A.S.S.); 4, T. Gould (M.T.A.). A.V. Junior Tropical: 1, P. Barnett (Independent); 2, R. Wells (Jones and Shipman); 3 and 4, R. Hill (Independent). Single Tail Goldfish: 1 and 2, K. Searman (Hinckley); 3, S. Andrews (Jones and Shipman); 4, A. and B. Faulkner (Hwyford Select). Twin Tail Goldfish: 1, K. Bates (Hinckley); 2, H. Heakes (Jones and Shipman); 3, R. Shakespear (Bedworth); 4, C. Pratt (Bedworth). A.V. Pond or River Fish: 1, C. Pratt (Bedworth); 2, N. Wood (Gloucester); 3, J. Wood (Gloucester). Junior Furnished Jar: 1 and 4, R. Wells (Jones and Shipman); 2, R. Hill (Independent); 3, N. Wood (Gloucester).

THERE were 506 entries at the second annual open show of the **Chesterfield and District A.S.** The society gaining the most number of points was Aireborough A.S. with 48 points. The individual with most entries was J. S. Hall of Aireborough with 33 entries. Best fish in show was a dwarf cichlid owned by H. Kuhn of Lincoln A.S.

The results were as follows: Guppies: 1, L. Smith (Castleford); 2 and 3, E. Kirk and Sons (South Humberston). Plaques: 1, W. Blundell (Doncaster); 2, Mr. and Mrs. Perkins (Worksop); 3, D. Lee (Derby Regent). Swordtails: 1, E. Kirk and Sons (South Humberston); 2, Mr. Mighalls (Hucknall and Bulwell); 3, Mr. Thorpe (Doncaster). Mollies: 1, K. Barrett (Doncaster); 2, J. Igoe (Sherwood); 3, Mr. and Mrs. Perkins (Worksop). A.O.V. Livebearer: 1 and 3, J. S. Hall (Aireborough); 2, Mr. and Mrs. Fletcher (Doncaster). Small Characins: 1, P. M. and D. Laycock (Sheaf Valley); 2, Mr. and Mrs. Cohen (Pontefract); 3, A. Lenthall (Chesterfield). Large Characins: 1, Mr. and Mrs. Bailey (Sherwood); 2, Mr. and Mrs. Daines (Doncaster); 3, A. Curchin (Castleford). Dwarf Cichlids: 1, H. Kuhn (Lincoln); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. and Mrs. Perkins (Worksop). Large Cichlids: 1, Mr. and Mrs. Blades (Cresswell); 2, Mr. and Mrs. Sellars (Lincoln); 3, Mr. and Mrs. Walker (Sheaf Valley). Angels: 1, Mr. Proctor; 2, Mrs. Igoe (Sherwood); 3, Mr. and Mrs. Smith (Sheffield). Large Barbs: 1, A. Feasey (Doncaster); 2, Mr. and Mrs. Daines (Doncaster); 3, D. and P. Birdall (Aireborough). Small Barbs: 1, Mr. and Mrs. Dickenson (Pontefract); 2, D. and P. Birdall (Aireborough); 3, Mr. and Mrs. Gullane (Buxton). Killifish: 1, Mr. and Mrs. Blades (Cresswell); 2, Mr. and Mrs. Borrill and Sons (Lincoln); 3, T. Smith (Sheffield). Carps and Minnows: 1, E. Kirk and Sons (South Humberston); 2, Mr. and Mrs. Wells (Doncaster); 3, T. Smith (Sheffield). Sharks and Foxes: 1, W. Blundell (Doncaster); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Gullane (Buxton). Fighters: 1, A. Curchin (Castleford); 2, P. Saniforth (Sheaf Valley); 3, Miss S. Clarke (Aireborough). Small Anabantids: 1, Mr. and Mrs. Cohen (Pontefract); 2, P. and C. Moreton

(Chesterfield); 3, Miss S. Clarke (Aireborough). A.O.V. Anabantids: 1, Mr. and Mrs. Gullane (Buxton); 2, Mr. and Mrs. Cohen (Pontefract); 3, Mr. and Mrs. Simpson (Worksop). Danios and Rasboras: 1, W. Blundell (Doncaster); 2, D. and P. Birdall (Aireborough); 3, Mr. and Mrs. Copley (Doncaster). Pairs Livebearers: 1, W. Blundell (Doncaster); 2, D. and P. Birdall (Aireborough); 3, Mr. Brown (Scunthorpe). Pairs Egglayers: 1, Mr. and Mrs. Well (Doncaster); 2, T. Reed (Worksop); 3, Mr. and Mrs. Perkins (Worksop). Breeders (Livebearers): 1 and 2, W. Blundell (Doncaster); 3, G. Pinley (Chesterfield). Breeders (Egglayers): 1, Mr. and Mrs. Wells (Doncaster); 2, T. Reed (Worksop); 3, Mr. Rhoades (Scunthorpe). Catfish and Loach over 3in.: 1, Mr. and Mrs. Simpson (Worksop); 2, Mr. Brown (Scunthorpe); 3, Mr. and Mrs. Wells (Doncaster). Catfish and Loach under 3in.: 1, P. M. and D. Laycock (Sheaf Valley); 2, Mr. Mighalls (Hucknall and Bulwell); 3, Miss S. Clarke (Aireborough). Corydoras and Brochis: 1, Mr. Mighalls (Hucknall and Bulwell); 2, L. Smith (Castleford); 3, Mr. and Mrs. Wells (Doncaster). A.O.V. Tropicals: 1, T. Douglas (Hull); 2, Mr. and Mrs. Burr (Scunthorpe); 3, Mr. and Mrs. Simpson (Worksop). Common Goldfish: 1 and 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Westcott (Hucknall and Bulwell). Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). A.O.V. Goldwater: 1, 2 and 3, J. S. Hall (Aireborough). Stunbunks: 1, 2 and 3, J. S. Hall (Aireborough). Moors and Calicos: 1, 2 and 3, J. S. Hall (Aireborough). Novice Class: 1, Miss H. Birdall (Aireborough); 2, Mr. and Mrs. K. Wood (Buxton); 3, Mr. Blate (Hucknall and Bulwell). Mini Jar: 1, M. Wilde (Acreington); 2, Mr. and Mrs. Wells (Doncaster); 3, Mrs. B. Gabe (Chesterfield).

**MEMBERS** of the **Dorchester and District A.S.**, elected to serve on the Committee for the coming year were as follows: H. Cornick (chairman); A. Billington (vice-chairman); Mrs. B. Jeffries (secretary); Mrs. L. Norman (treasurer); N. Derrick, R. Christopher, Mrs. M. Fox, N. Matthews, A. Mimbury (committee members). A talk and slide show on "Setting up a Tank" was given by H. Cornick, followed by questions and discussions.

The Society's forthcoming events will include the Annual Dinner, Skirle and Social Evening, Jumble Sale and Christmas Party.

**AT** the **Wrexham Tropical Fish Society's** recent annual general meeting the following officials were elected for the forthcoming season: Chairman, T. Pound; vice-chairman, R. Mathers; treasurer, Mrs. V. Oliver; secretary, E. Jones; librarian, B. Roberts; show secretary, C. Pritchard.

During recent meetings members have had talks on "Breeding Egglayers in the Community Tank" and "Rocks, etc., which can safely be used in the Fish Tank," by R. Mathers. Samples of rock, slabs, wood, etc., were brought along by members for discussion. Results of table shows judged by C. Pritchard have been: Mollies: 1 and 2, B. Roberts; 3, B. Jones; Plaques: T. Pound. Dwarf Cichlid: 1 and 2, E. Jones; 3, B. Roberts. A.O.V.: B. Roberts. Highest pointed junior: B. Roberts.

**THE** Committee elected at the annual general meeting of the **Middleton and District A.S.** is as follows: Chairman, A. Wilkes; vice-chairman, R. Forsyth; secretary and assistant secretary, Mr. and Mrs. E. Ward; treasurer, Mrs. J. Wilkes; show secretary, L. Dean; catering, Miss K. Coyle; librarian, B. Nutall; publicity, K. Smith. Anyone wanting information on the Society should contact the secretary, 2 St. Martin Street, Castleton, Rochdale, Lancs.

**THE** **Iford and District Aquarist's and Pondkeepers' Society** held its annual all-classes table show in October. The show drew a record number of entries from club members.

Mr. Baker was the F.B.A.S. judge who judged the 162 entries. Results: Individual Furnished Aquaria: 1, D. Seaman; 2 and 4, M. Shadrack; 3, R. Ruth. A.V. Barb: 1 and 2, T. Robinson; 3, R. Ruth; 4, P. Reade. A.V. Characin: 1 and 2, W. Rowe; 3, J. Rendell; 4, M. Shadrack. A.V. Cichlid: 1, J. Rendell; 2 and 4, R. Ruth; 3, W. Rowe. A.V. Labyrinth: 1, C. Hackhall; 2 and 4, P. Reade; 3, M. Shadrack. A.V. Tropical Catfish: 1, A. Rowe; 2, P. Reade; 3, W. Rowe; 4, M. Shadrack. A.V. Mollie: 1, W. Rowe; 2 and 3, M. Shadrack. A.V. Swordtail: 1, 2 and 3, D. Seaman; 4, R. Ruth. A.V. Platy: 1, D. Seaman; 2, W. Rowe; 3, P. Reade. A.V. Male Guppy: 1, M. Shadrack; 2, P. Barnham; 3, C. Irish; 4, J. Rendell. A.V. Female Guppy: 1, M. Shadrack; 2, J. Rendell; 3, W. Rowe. A.V. W.C.M.M. and Danios: 1, C. Irish; 2 and 3, M. Shadrack; 4, R. Ruth. A.V. Rasbora: 1, J. Rendell; 2, T. Robinson; 3, R. Ruth; 4, W. Rowe. Breeders Livebearers: 1, W. Rowe; 2 and 3, M. Shadrack. Breeders Egglayers: 1 and 2, M. Shadrack; 3, H. Berger. A.V. Loaches: 1 and 2, W. Rowe; 3, D. Knopp; 4, R. Ruth. A.V. Labo: 1, P. Reade. Singletail Goldfish: 1 and 4, H. Berger; 2, M. Shadrack; 3, C. Donne. Twintail Goldfish: 1, 2, 3 and 4, H. Berger. A.O.V. Tropical Fish: 1 and 4, W. Rowe; 2 and 3, P. Reade. A.O.V. Goldwater Fish: 1 and 2, W. Rowe. Tropical Lant: 1, L. Smith; 2 and 3, M. Shadrack. Cold Water Plant: 1 and 3, M. Bell; 2, W. Rowe; 4, H. Berger. Breeders Pairs: 1, W. Rowe; 2, C. Hackhall; 3 and 4, M. Shadrack.

**FOR** their final table show of the 1973 club championship, **Mid-Sussex A.S.** invited two first-class speakers in R. Forster and J. Parker. Mr. Parker gave a most interesting talk on home-made gadgets for the hobbyist, it was generally agreed by the members that this was one of the most useful lectures they had ever heard. Mr. Forster then showed some beautiful slides of his amazing collection of plants from all over the world. Many rare and all in tip-top conditions, his plants are an inspiration to everyone who sees them.

C. West was the F.B.A.S. judge for the evening and he certainly had his work cut out to sort out the fish that were on the bench. He maintained that the standard of fish was at least as good as any of the major open shows that he had attended this year. Results: Fish of the Year: 1 and 3, K. Groves; 2, J. and B. Burtles. Novice: 1 and 4, T. and E. Tester; 2, B. Stanger; 3, S. Farmer. Breeders (Egglayers): 1, K. Groves; 2, J. and B. Burtles; 3 and 4, D. Soper. Breeders (Livebearers): 1, 2, 3 and 4, D. Soper.

**THE** annual open show of the **East London Aquarist and Pondkeepers Association** was a highly successful event with a total of 266 entries. One of the highlights of the show was the furnished Aquaria which gained 29 entries alone, and most important was the fact that all fish entries was of high standard. Annual show results: Club furnished Aquaria: 1, Leytonstone A.S.; 2 and 3, Durnmow and Dis. A.S.; 3 and 4, Romford A.S. Mini-furnished aquaria: 1, K. Wrightson; 2, W. Peggs; 3, G. Arrow; 4, L. Baker. Aquatic Cuttings etc.: 1, J. Boss; 2, W. Corby; 3, H. Juson; 4, Mrs. P. Harris. Characins: 1, K. Pasbrick; 2, K. Wrightson; 3 and 4, M. Pearson. Dwarf Cichlids: 1, W. Corby; 2, 3 and 4, P. Vicker. Egg-laying Toothcrops: 1, W. Corby; 2, J. Boss; 3, Mrs. P. Harris; 4, R. Argent. A.O.V. Egglayers: 1 and 3, M. Pearson; 2, P. Vicker; 4, F. Jacobs. A.O.V. Livebearers: 1, Mr. and Mrs. Butlam; 2, A. Chandler; 3, K. Appleyard; 4, P. Vicker. Single-tailed



Goldfish: 1, 2, 3, and 4, I. Fleming. Dornal-less Goldfish: 1 and 3, J. Linale; 2 and 4, P. Kadwell. Individual furnished Aquaria: 1, Mrs. J. Arrow; 2, W. Corby; 3, S. Jacobs; 4, F. Vicker. Aquatic Rooted Plants: 1, S. Field; 2, K. Wrighton; 3, F. Vicker; 4, K. Baker. Barbs: 1, K. Wrighton; 2, J. Boss; 3, Mrs. P. Harris; 4, A. Chandler. Cichlids: 1, Mr. and Mrs. Bousam; 2, C. Dixon; 3, D. Byfield; 4, D. McMurdie. Labyrinths: 1, Mrs. J. Arrow; 2, M. Pearson; 3, D. Lyne; 4, D. Sheridan. Sirens Fighters: 1 and 2, F. Vicker; 3 and 4, W. Corby. Danios, Rasboras, Minnows: 1, R. Argent; 2, M. Pearson; 3, Mrs. P. Harris; 4, F. Vicker. A.V. Mollies: 1, E. Jacobs; 2, H. Jaxon; 3, W. Baker; 4, D. Lyne. Twin-tailed Goldfish: 1, 2 and 3, T. Halpin; 4, J. Linale.

RESULTING from talks during the past month between Goldfish breeders from the National Society and various London Clubs it was agreed to form The Association of Goldfish Breeders. The founder members of the association are Messrs. H. J. Beace, L. P. Clements, M. D. Cleave, W. Cook, R. Elden, I. Fleming, G. A. Fleming, A. H. Lawman and D. R. Lunn, and in the next few months other Goldfish breeders will be invited to join. The intentions of the association include the acceptance of all varieties of the Goldfish and to encourage the monthly of individual breeders work at the monthly table shows. To achieve by discussion and compromise national standards for all varieties of Goldfish and national show regulations and to co-operate with all organisations who also believe these to be essential requirements for all goldfish enthusiasts.

AT the September meeting of Section 4 Aquarists Study Society the chairman Mr. Welch gave an informative talk in setting up home aquaria. Members present agreed it was most enjoyable. The table show for "My Best Fish" was won by Mr. Harvey.

OVER thirty members and their families had the opportunity for a behind-the-scenes visit to London Zoo Aquarium in September with the consensus of opinion being that such trips are well worth while. Future visits to places of interest further afield, including a projected visit to the Frankfurt International Aquarists exhibition are in the planning stage. The augmented Group Management Committee is as follows: Secretary B. Wilkinson, Assistant Sec. P. Ireland, PRO G. Cox, Treasurer: D. Hammonson, Projects Officer A. Hawkwell.

THE Privateers A.S. (Shipley) heard a lecture at the October meeting, on Fish Breeding by Mr. H. Foden (Huddersfield), who explained many details admirably.

THE Wednesday and D. A.S. held their annual general meeting early in September. There was a good attendance and the officers elected were: R. Skidmore, president; B. Coley, chairman; R. Law, secretary; R. Hughes, treasurer; J. Reeves, show secretary; R. Dawes, assistant show secretary. The committee consists of A. Wood, P. Bough, E. Hyde, T. O'Sullivan, B. Jinks and N. Wale. Results of the October table show were: Anabantids Class A: 1, J. Reeves; 2, R. Dawes; 3, A. Wood. Class B: 1, R. Law; 2, P. Bough; 3, A. Shenton. Barbs Class A: 1, A. Wood; 2, R. Farmer; 3, R. Dawes. Novice A.V.: 1 and 2, R. Hughes; 3, B. Jinks. Best in show was R. Hughes. One of the most experienced members gave a comprehensive talk on Anabantids of the World. Meetings are held at the Midlands Vaults (The Lamp), Upper High St., Wednesday, Staffs, at 8 p.m. on the first Monday in every month. All local aquarists will be made very welcome.

ENTRIES at the Bristol A.S. open show this year were down, but the quality of the fish shown was superb. There was a tie for the

Mabel Davis Trophy, which is awarded for the best exhibit in the show. The judges being unable to separate a veiltail exhibited by S. T. Tibble and a Phyturie Barb exhibited by D. I. Mackay. The P. G. Denman Cup was won by N. Gray for the highest number of points in the show. The B. T. Child Challenge Shield was taken by R. J. King for the second best Coldwater Fish. Results: Goldfish: 1, T. Hamshire; 2, S. Lloyd; 3, D. I. Mackay; 4, K. P. Press. Bristol Shubunkins (3 in.): 1 and 3, R. Pincock; 2 and 4, D. S. Langdon. Bristol Shubunkins (5 in.): 1, 3 and 4, D. S. Langdon; 2, A. E. Roberts. Veiltails: 1, S. T. Tibble; 2, J. Linale; 3, A. E. Roberts; 4, R. J. King. Moons: 1, S. Lloyd; 2 and 3, A. E. Roberts; 4, S. T. Tibble. Telescopes (other than Moons): 1, S. T. Tibble; 2 and 4, G. J. Bell; 3, R. J. King. Orandas: 1 and 2, A. E. Roberts; 3 and 4, R. J. King. Nymphs and Comets: 1, K. P. Press; 2, W. Leach; 3, C. Packer. Fantails Scaled: 1 and 2, R. J. King; 3 and 4, R. Davies. Fantails Calico: 1, C. Packer; 2, J. Linale; 3, S. T. Tibble. Koi A.O.V. Pond or River: 1, V. Collins; 2, W. Ham; 3, Mrs. M. Dudley; 4, R. N. Bowden. Bristol Shubunkins bred 1975: 1 and 2, R. Oxenham; 3 and 4, G. J. Bell. Moons, bred 1975: 1, 2 and 3, A. E. Roberts. A.O.V. Fancy Fish, bred 1975: 1, A. E. Roberts; 2, 3 and 4, R. J. King. Breeders Singletails, team of 4: 1, J. Phillips; 2, G. A. Fleming; 3, A. J. Churchill; 4, G. J. Bell. Breeders Twintails, team of 4: 1 and 3, A. E. Roberts; 2, J. Linale; 4, R. J. King. Bristol Shubunkins matched pairs: 1, A. G. Churchill; 2 and 4, G. A. Fleming; 3, W. H. Clark. Novice Bristol Shubunkins: 1, A. G. Churchill; 2 and 4, K. Gray; 3, R. J. Bennett. Furnished Aquaria Tropical: 1, R. A. Bennett; 2, N. Gray. Furnished Aquaria Inter-club: Bristol A.S. Aquatic Plants: 1, K. P. Press; 2, S. T. Tibble; 3, A. W. Leach; 4, M. Butcher. Fighting Fish: 1 and 3, N. Gray; 2, K. P. Press. Labyrinth: 1, R. C. Hyett; 2, D. I. Mackay; 3, R. A. Bennett; 4, Master F. Dunford. Barbs: 1, D. I. Mackay; 2, W. Ham; 3 and 4, N. Gray. Characins H. and H.: 1, R. C. Hyett; 2, G. R. Furber. K. Dunford; 4, J. A. Pollard. A.O.V. Characins: 1, J. Phillips; 2, G. R. Furber; 3, R. A. Bennett; 4, N. Gray. Cichlids: 1 and 2, R. C. Hyett; 3 and 4, T. Dunford. Angel Fish: 1, N. Gray; 2, K. P. Press; 3 and 4, T. Hamshire. A.O.V. Egglayers: 1, N. Gray; 2, D. Noble; 3, T. D. Fryer; 4, Miss A. H. Morgan. Catfish: 1, K. P. Press; 2, Miss A. H. Morgan; 3, D. Noble; 4, N. Gray. Guppies (female): 1, 1 and 4, N. Gray; 2, T. Toyey. Guppies (male): 1 and 2, K. P. Press; 3 and 4, N. Gray. Sweettails: 1 and 2, N. Gray; 3, T. D. Fryer. A.O.V. Livebearers: 1, 2, 3 and 4, N. Gray. Tropical Breeders (Livebearers): 1, 2 and 3, N. Gray. Tropical Breeders (Jigglayers): 1 and 2, A. F. Sims; 3, T. Toyey; 4, L. Littleton. Mariner: 1, C. Summers.

The Bristol A.S. meets on the second Monday of each month at Bishopston Parish Halls, at 7.30 p.m. Visitors are always welcome.

RECENTLY the Kingston and District A.S. held an exhibition of tropical and coldwater fish, also furnished aquaria to show the public what an interesting pastime ours is. The idea came from the show secretary, Mr. Makie and assistant, J. Pollard, with the helpful co-operation of the Surrey County Council library. It was very gratifying to see so many people come along and to return at a later time with their friends and families. By the questions asked, great interest was shown by the visitors about the exhibits. The Club is very grateful for the help given and wish to thank Mr. and Mrs. Nethrich and Mr. and Mrs. Lamborne, also Mrs. Dudley for their exhibits and time spent.

MEMBERS of South Shields A.S. had a grand day out when they went to the Belle Vue Show at Manchester. 40 adults and 17 children travelled by coach and all seemed to enjoy the exhibition of fish and the trade stands.

The Society appreciates the hard work that goes into the tabloids. At home in South Shields the Society hold their meetings at 8 p.m. on alternate Wednesdays and all are welcome to join.

TABLE show results of the West of Scotland Exotic Fish Club in October were: Cichlids: 1, R. Moore; 2, H. Cameron; 3 and 4, J. Ferguson. Pair of Swords: 1, W. Agnew; 2, R. Moore; 3, J. Ferguson; 4, J. Campbell. Barbs: 1, H. Cameron; 2, J. Watson; 3, T. Currie; 4, A. Munnoch. Guest speaker for that evening was Hugh Spence, who gave a most interesting talk on fish which he has kept and bred, also showing the club the slides of his fish. The club also visited the show at Belle Vue, Manchester, The British Aquarist Festival, and this year's show has been the best the club has seen for a long time. After the show was finished the members spent the rest of the day sightseeing in Blackpool.

THERE was a good attendance at the recent October meeting of the New Forest A.S., the main speaker being Ron Masley. He gave a talk on his experiences of spawning and rearing of Characins. After the interval there was a lively auction of fishes and an aquarium, followed by a raffle to assist society funds. The table show results were as follows: Travers Breeders Trophy: 1, I. Lane; 2, T. Barnes; 3, D. Harding; 4, J. Jeffrey. Twintail Goldfish: 1, R. Travers; 2, R. Percy.

THE Llantwit Major A.S. at their October meeting held an inter-club contest with Penarth A.S., this being the club's final contest in Zone 3 of the C.N.A.A. Knock-out Competition to decide the top South Wales Society in the Association. Results: Llantwit Major 12 points; Penarth A.S. 8 points. Winners: Class M: first and Best Fish, M. Lovell (Penarth); second, Master P. Glover (L.M.A.S.); three, H. Chick (L.M.A.S.); fourth, W. Lambek (L.M.A.S.). Class T: 1, C. Corp (Penarth); 2 and 3, J. Massey (L.M.A.S.); 4, Master P. Glover, Judges Messrs. C. Harding, P. Jordan, both F.R.A.S./C.N.A.A.

While the judging of the large number of entries was in progress an inter-club quiz took place, controlled most effectively by M. Williams (Rhondda A.S.) as quizmaster and A. Crier (Rhondda A.S.) as adjudicator. Llantwit Major came out winners by a narrow margin in an exciting finish.

MEMBERS of Tonbridge D.A.S. had a very entertaining talk at the October meeting by P. Tomkins on Aquarium Management. Table show results were: Characins: 1, Mrs. I. Bellingham; 2 and 3, D. R. Puchard; 4, Mrs. B. M. Puchard. The show judge was P. Cottle of Gravesend.

As winners of the West Midlands League East Division G.K.N.A.S. met Wanbourne A.S. the winners of the West Midlands League West Division in a repeat of last year's final.

While the Judges, Messrs. Whitfield and Massey were doing their duties the members were entertained by a film show put on by the West Midlands League Committee. Whereas last year's result ended in a draw, G.K.N. made certain of the trophy this year by 36 points to 20 points, so becoming West Midlands League Champions again.

The results for the eight classes were: Barbs: 1, J. Croft (Wanbourne); 2, K. Buxton (G. K. N.); 3, A. Masby (G.K.N.). Cichlids: 1, K. Hall (G.K.N.); 2, M. Baldwin (Wanbourne); 3, J. Croft (Wanbourne). Livebearers: 1, G. Coney (G.K.N.); 2, G. Stoddman (Wanbourne); 3, S. Cook (Wanbourne). Characins: 1, J. Croft (Wanbourne); 2, K. Buxton (G.K.N.); 3, T. Saunder (G.K.N.). A.O.V.: 1, K. Harris (G.K.N.); 2, J. Croft (Wanbourne); 3, T. Saunder (G.K.N.).



Carfish: 1, D. Penwright (G.K.N.); 2, T. Saunderson (G.K.N.); 3, J. Goodman (Wanborough).  
Anabantids: 1, T. Lowe (G.K.N.); 2 and 3, M. Balchin (Wanborough).  
Rasbora: 1 and 2, T. Lowe (G.K.N.); 3, A. Hall (G.K.N.).

AT the October meeting of the **Bishop Cleeve A.S.**, the members enjoyed a most informative and interesting talk by S. Lloyd on the Aspects of Coldwater Fishkeeping and Breeding. Mr. Lloyd also judged the table show of coldwater fish, the results of which were:—1, C. Fletcher; 2 and 4, M. Bishop; 3, P. Rossi.

**OFFICERS** and Committee elected at the **Swillington A.S.** annual general meeting were: President, R. Hislop; vice-president, D. Strad; treasurer, R. Stringer; secretary, J. Abbott; show secretary, C. Townsend; social secretary, Mrs. A. Hislop; committee, R. Hislop, P. Reynolds, P. Reynolds, D. Blakely, G. Banks, C. Freeman, B. Hamberg.

DUE to publicity and efforts by founder members of the **Catfish Association of Great Britain**, the response for membership has been overwhelming. This has proved that there is a great need for more information on catfish.

Following are the splits for classes G and H: G, *Ameiuridae*; Gb, *Auchenipteridae*; Gc, *Bagridae*; Gd, *Bunocephalidae*; Ge, *Callichthyidae*; Gf, *Chacidae*; Gg, *Clariidae*; Gh, *Doradidae*; Gi, *Helogenidae*; Gk, *Loricariidae*; Gl, *Malapteruridae*; Gm, *Mochocidae*; Gn, *Pimelodidae*; Go, *Plotosidae*; Gp, *Pysididae*; Gq, *Schilbeidae*; Gr, *Siluridae*; Gz, A.O.S. Cat. H, *Brochis*; Hb, *Corydoras* 2 in. and under; Hc, *Corydoras* over 2 in. (all as per F.B.A.S. size sheet); Hd, *Corydoras* not on size sheet.

On March 9th the Association will be holding an open show for Catfish only and with the approval of the Federation of British Aquatic Societies have split classes G and H (including pairs and breeders) into 18 different classes. They will not be using all the splits from class G as many of these fish they do not see and some of the families only have one or two fish in them. Therefore the Association will only be using the following classes in the open show: Gc, Gg, Gh, Gk, Gm, Gn, Gq, Gr, Gz, Hb, Hc, Hd, Hg, Ng, Nh, Xg, Xh, making a total of eighteen classes.

Another very important feature (possibly for the first time in the history of fish shows) the Association will be sponsored and supported by a large industrial group—The Automatic Catering Supplies—a leading supplier to the Vending Machine Industry.

If you are interested in joining or would like further information, please contact the secretary, N. E. Sawford, 65 Burlington Road, New Malden, Surrey. Tel: 01-949 1707.

THE October meeting of the **Weymouth A.S.** was well attended with 33 members being present. The subject of the meeting was Furnished Aquaria, members being asked to dress a tank in 5 minutes, the water and gravel already being in the tank. Master Paul Taylor won the light-hearted competition, in which a large number of members joined.

Another competition held during the evening was that of Novelty Jars, which was won by A. Billington with a very attractively dressed sweet jar.

The table show results were: Dwarf Cichlids: 1 and 3, Mrs. E. Hart; 2 and 4, K. Forrester. Angels: 1, Mrs. M. Mackie; 2, P. Taylor. Cichlids: 1, 2 and 3, Mrs. E. Hart; 4, A. Worth.

The Society would like to take this opportunity of wishing the "Aquarist and Pondkeeper" and its readers a Happy Christmas and a prosperous New Year. Visitors to Weymouth during the festive season are welcome to join the meetings on the 2nd Tuesday of the month at 7.30 p.m. at the Radcliff Hall, Queens Road, Radcliffe Spa, Weymouth.

#### RESULTS of the Plymouth Aquarist and Pondkeepers open show were as follows:

Class A, Furnished Tank: 1, Mrs. Lay; 2, Master Cole; 3, Mr. and Mrs. Taylor; 4, Mrs. Budd; 2 and 3, Mrs. McLean; 4, Mr. and Mrs. Taylor. Class Aa, Furnished Tank: 1, Mrs. Tabb; 2 and 3, Mrs. A.O.S.; 1 and 2, Mr. Leeder; 3, Mr. Hodgkiss; 4, Mr. Coles. Barbs: 1, Miss Padner; 2, Mr. Wolfe; 3, Mr. Leeder; 4, Mr. Kirby. Characins A.O.S.: 1, Mr. Wolfe; 2, Mr. Kirby; 3, Mr. Hodgkiss; 4, Mr. Webber. Characins: 1 and 4, Mr. Wolfe; 2, Mr. Orsman; 3, Mr. Kirby. Cichlids A.O.S.: 1, Mr. Piddley; 2, Mr. Fidoek; 3, Mr. Lyons; 4, Mr. Leeder. Angels: 1, Mr. Short; 2, Mr. and Mrs. Taylor; 3, Mrs. Kirby; 4, Mr. Hodgkiss. Dwarf Cichlids: 1, 2, 3 and 4, Mr. Bragg. Labyrinth A.O.S.: 1, Mr. Wolfe; 2, Mr. Mudge; 3, Mr. Leeder; 4, Mrs. Griffiths. Betta Splendens: 1, Mr. Wood; 2 and 3, Mr. Fidoek; 4, Mrs. Griffiths. Egg-laying Tooth Carps: 1 and 2, J. Rundle; 3, Mr. Davis; 4, Mr. Orsman. Tropical Catfish: 1, Mr. Hodgkiss; 2, Mr. Piddley; 3, Master Smith; 4, Mr. Gardner. Corydoras and Brochis: 1, 2 and 3, Mr. Kirby; 4, Mr. Smyth. Rasbora: 1, Mr. Hodgkiss; 2, Mr. Mudge; 3, Mr. Lyons; 4, Mrs. Tabb. Danios and W.C.M.M.: 1, 2 and 4, Mr. Wolfe; 3, Master Edwards. Loaches: 1, Mr. Kirby; 2, Mr. Wolfe; 3, Mr. Hodgkiss; 4, Mr. Piddley. Tropical Egg-layers A.O.S.: 1, Mr. Budd; 2, Mr. Lyons; 3, Mr. Fidoek; 4, Mr. Piddley. Labeo: 1 and 3, Mr. Leeder; 2, Mr. Gardner; 4, Mr. Wolfe. Sexed Pairs, Egg-layers: 1 and 3, Mr. Hodgkiss; 2, Mr. Kirby; 4, Mr. Leeder. Sexed Pairs, Livebearers: 1, Mr. Westlake; 2, Mr. Wolfe; 3, Mr. and Mrs. Taylor; 4, Mr. Davis. Guppy Male: 1 and 4, Master Phillips; 2 and 3, Mr. Reid. Guppy Female: 1 and 2, Mr. Reid; 3, Mr. Bragg; 4, Mr. Wolfe. Sword-tails: 1, Mr. Bragg; 2, Mr. Rundle; 3, Mr. Coles; 4, Mrs. Griffiths. Platies: 1 and 4, Mr. Davis; 2, Mrs. Griffiths; 3, Mr. Luscombe. Mollies: 1, Mr. and Mrs. Taylor; 2 and 4, Mr. Wolfe; 3, Mr. Smith. Livebearers A.O.S.: 1, 2 and 3, Mr. Fidoek; 4, Mr. Davis. Single Tailed Goldfish: 1, Mr. Gardner; 2, Mr. W. Rundle; 3, Mr. Davis; 4, Mr. Fidoek. Goldwater A.O.S.: 1 and 3, Mr. Matthews; 2, Mr. Fidoek; 4, Mr. Webber. Tropical Breeders (Egg-layers): 1, Mr. Leeder; 2, 3 and 4, Mr. W. Rundle. Tropical Breeders (Livebearers): 1 and 3, Mr. Davis; 2, Mr. J. Rundle; 4, Mr. Reid.

THE October meeting of the **Bristol A.S.** was taken up by the reports from various members of the committee on the success and failures of the latest open show. The reports were followed by a general questions and answers session on a variety of fishy matters, whilst the judging of the table show was taking place. The results of the table show were as follows: Labyrinth: 1, Miss H. Morgan. A.O.V. Egg-layers: 1, Miss H. Morgan. Tropical Plants: 1, 2 and 3, Miss H. Morgan. A.O.V. Pond or River: 1, W. Ham; 2, Miss H. Morgan. A.O.V. C.W. Fancy Fish: 1, 2 and 3, G. Bell; 4, C. Summers. Shubunkins, bred 1973: 1, G. Bell; 2, J. Phillips; 3 and 4, R. J. Bennett. C. W. Plant: Miss H. Morgan.

THE Fancy Guppy Association (Birmingham Section) Points Cup Trophy Competition comprised of twelve calendar monthly table shows. First ten positions only. Table show: 1-7 inclusive, D. Phillimore 197 pts; G. Steadman 109 pts; K. Lee 102 pts; R. Jones 101 pts; C. Truman 82 pts; M. Delingpole 75 pts; J. Croft 56 pts; Mr. and Mrs. Burnett 50 pts; A. Charlton 49 pts; W. Bishop 45 pts. At last month's meeting R. Francis, from Aberdare, South Wales, gained his first Silver Card Award in the Dove Tail section. Mr. Delingpole, of Aldechurch received a Gold Badge for Advanced Master Breeders Teams and A. C. and J. Terence of Bristol gained Best Male, Best Breeder and Best in Show, receiving two Silver Awards. The Association meet on the fourth Sunday afternoon of each month at The Glebe Farm Community Centre, Stechford, Birmingham. All Guppy enthusiasts will be warmly

welcomed and further details can be obtained from the secretary, Graham S. Beacham, 35 Frankton Close, Matchborough, Redditch. Tel.: Ryknild 4697.

THE year's programme of the **High Wycombe A.S.** continued with September set aside for club business at which all members were pleased to hear of the club's success in the Three Counties Quiz League. Concurrent with this meeting the fourth table show of the present series was held. Early in October Mr. Mills revealed the more intricate secrets of the chemistry of water. Members were given the opportunity to examine various techniques for pH and DH measurement. The 25th October was arranged as a twelve-a-side competition against another local club but owing to an unfortunate mix up the opposition failed to show. Judge M. Carter, however, made the evening a success by making it an individual competition among the club's members. New members (14 years' old plus) are always welcome at The White Horse, High Wycombe, on alternate Thursdays. Telephone the secretary at Penn 3825 for details.

AT the annual general meeting of the **Gloucester Fishkeeping and Social Club** the secretary stated that the membership had increased and that the table shows had been extended to cover both cold water and tropical fish and also a section for novelty decorated aquaria. The treasurer's report showed that financially it had been a very successful year and the social secretary said that it had been a satisfactory year with various events arranged, including dances, social evenings, and trips. It was with regret that the meeting heard that the chairman, R. E. H. Mosler, would be unable to stand again as chairman, a post he has held since the club was formed in September, 1970. The meeting thanked him for his services to the club and wished him many more years as a member. The following were elected: Chairman, Mrs. E. Adlam; secretary, J. B. Adlam; treasurer, T. Collier, who also becomes social secretary, and M. Toomey is now table show organiser.

The club arranged a social evening with music and dancing, for the presentation of the club trophies. A large attendance was pleased that the club president, John Wyatt, was able to present the winners with their awards, and Ivor Wilden of the Barrier Reef, who is a vice-president, assisted in the presentation. The winners were: President's Cup (aggregate winner table shows), Mrs. E. Adlam; Collier Rose Bowl (runner-up), C. Dyke; Cold water table shows trophy, Mrs. J. Mitchell. Mrs. E. Adlam Cup for junior table shows, R. Mills. Merrett Rose Bowl, T. Toomey. Decorated Aquaria Cup, Mrs. E. Adlam. The results of the home aquarium competition came as a great surprise as when the winners were announced, a junior member, C. Dyke, won the Home Aquarium Trophy and the runner-up who received the Founder's Cup was a new member, J. Bartlett, who has only been keeping tropical fish for a few weeks.

A TALK on tubifex was given by A. Villiers at the September meeting of the **Vauxhall Motors A.S.** The table show was for A.V. and novices. A.V.: 1, T. Philip; 2, D. Luxton; 3, M. Tearle; 4, M. Marchant. Novices: 1 and 3, M. Tearle; 2, M. Marchant.

**SECRETARY CHANGES**  
**Aberdeen A.S.:** A. Inisich, c/o Dee Valley Caravans, Drumoak, Aberdeenshire.  
**Swillington A.S.:** C. Townsend, 16 Firtree Gardens, Mootown, Leeds 17.  
**Blackburn Aquarists Waterlife Society:** P. J. Whelan, 109 Dunoon Drive, Shadsworth, Blackburn.  
**Eboracum Aquarists:** L. Magglebeck, 64 Sutherland Street, The Mount, York, YO2 1HQ  
**Gloucester A.S.:** B. Walker, 41 Hailes Road, Gloucester.  
**Blakeborough A.S.:** T. Barker, 41-43 Camm Street, Brighouse, Yorks.

### SHOW SECRETARY

Mid-Sussex A.S.: K. Groves, 11 Bishopric Court, Horsham, Sussex.

### VENUE CHANGE

Cardiff A.S.: The new venue is now The Tredegar, Clifton Street, Rother, Cardiff, the last Thursday of each month at 8 p.m.

### AQUARIST CALENDAR

2nd December: Horsforth A.S. fourth Open Show, New Civic Hall, Stanningley, Pudsey. Show secretary, C. Corns, 15 Thornleigh Grove, Leeds, LS9 8QR.

8th December: The Bury St. Edmunds and District A.S. will be holding an Exhibition of fish at the Oddfellows Hall, Whiting Street, Bury St. Edmunds. Doors open from 10 a.m. to 5.30 p.m. Refreshments available.

### 1974

9th March: Catfish Association (G.B.) are holding their Open Show which consists of eighteen classes of Catfish (G. and H.). Venue to be announced later. Show secretary,

Mr. D. Lambourne, 7 Wheeler Court, Plough Road, London, SW11 2AX. Tel: 01-223 2630.

7th April: Nelson A.S. Open Show at "Civic Centre", Stanley Street, Nelson. Information may be had from H. Illingsworth, 94 Barrowford Road, Colne, Lancs.

15th April (Easter Monday): Southampton A.S. Open Show at the Avenue Hall, Southampton. Show secretary, P. Brown, 215 Spring Road, Sholing, Southampton.

28th April: Coventry Pool and Aquarium Society, Open Show. Further details (s.a.c. please) from show secretary, S. Woodbridge, 32 Ridgeway Avenue, Coventry, CV3 5BP.

28th April: Blakesborough A.S. Third Open Show in Canteen of J. Blakesborough & Sons, River Street, Birds Royde Lane, Brighouse. Show secretary, T. Barker, 41-43 Camm Street, Brighouse, Yorks.

5th May: Ostram A.S. Open Show, at the Recreation Hall, Refuge Street, Shaw, Near Oldham, Lancs.

11th May: Southend, Leigh and District A.S. Open Show, to be held at St. Clements Hall, Leigh-on-Sea. Club furnished, individual

furnished, aquascapes and marine classes included. Show schedules from Derek Durran, 172 Trinity Road, Southend-on-Sea, Essex. Tel: Southend 610578.

12th May: Gloucester A.S. third Open Show will be held at The Education and Leisure Centre, Fairwick Road, Gloucester. Schedules Feb. onwards from B. Walker, 41 Hailes Road, Gloucester.

19th May: Yeovil and District A.S. Venue to be decided.

15th June: Swillington A.S. Open Show at John Smeaton School, Barwick Road, Secroft, Leeds. Details from C. Townsend, 16 Firtree Gardens, Moortown, Leeds 17.

16th June: Salisbury and District A.S. 10th Annual Open Show will be held at The City Hall, Fisherton Street, Salisbury. Further information later.

19th July: Sandgrounders' A.S. Open Show. Moor's Cop Secondary School.

22nd September: Torbay A.S. proposes to hold its sixth Annual Open Show at the Torquay Town Hall; details of show schedules, etc., later.

# CHAMPION OF CHAMPIONS

## Competition Results



1st

L. B. Booker

2nd

Mr. and Mrs. Shipman

3rd

G. B. Cooper

Morecambe Bay A.S. 54 pts. Grantham and District A.S. 41 pts. Peterlee A.S. 40 pts.

### RESULTS OF OTHER FESTIVAL COMPETITIONS

Best Society Tropical Furnished Aquarium: 1, Halifax A.S. 75 pts.; 2, F.G.A. 74 pts.; 3, Lanarkshire A.S. 68 pts. Best Society Coldwater Furnished Aquarium: 1, Halifax A.S. 73 pts.; 2, Northern Goldfish 42 pts.; 3, Edinburgh A. & P. 40 pts. Best Individual Furnished aquarium (tropical): 1, D. Fryer (Halifax A.S.) 76 pts.; 2, A. P. Vaisiere (Merseyside A.S.) 72 pts.; 3, Mrs. S. Glen (Bury A.S.) 69 pts. Best Individual Furnished Aquarium (coldwater): 1, D. L. Shields (Halifax) 68 pts.; 2, H. Penhall (Ostram) 66 pts.; 3, A. Mills (Bury) 63 pts. Best Aquascape: 1, H. Penhall (Ostram) 78 pts.; 2, S. Seymour (Merseyside) 68 pts.; 3, J. Thompson (Edinburgh A. & P.S.) 64 pts. Novelty Aquascape: 1, A. Strange (Basingstoke) 79 pts.; 2, E. Seymour (Merseyside) 77 pts.; 3, J. Brearley (Village) 70 pts. Common Goldfish: 1, A. Ysane (Edinburgh) 78 pts.; 2, W. H. Ramsden (Northern Goldfish) 77 pts.; 3, Mrs. D. M. Matthews (Northern Goldfish) 74 pts. Shubunkins (Bristol and London): 1, B. M. Rothwell (Northern Goldfish) 78 pts.; 2, H. Penhall (Ostram) 73 pts.; 3, B. M. Rothwell (Northern Goldfish) 72 pts. Moors: 1, W. H. Ramsden (Northern Goldfish) 79 pts.; 2, W. H. Ramsden (Northern Goldfish) 61 pts.; 3, C. Whitsey (Accrington) 58 pts. Veiltails: 1, W. H. Ramsden (Northern Goldfish) 64 pts.; 2, W. H. Ramsden (Northern Goldfish) 63 pts.; 3, C. W. H. Whitsey (Accrington) 61 pts. A.O.V. Fancy Goldfish: 1, W. H. Ramsden (Northern Goldfish) 76 pts.; 2, R. Rich (Basingstoke) 63 pts.; 3, J. S. Hall (Aireborough) 62 pts. Any species of Coldwater Fish other than those mentioned above: 1, W. H. Ramsden (Northern Goldfish) 70 pts.; 2, S. Walsh (Accrington) 66 pts.; 3, J. S. Hall (Aireborough) 63 pts. Guppy (Single): 1, H. Baldwin (F.G.A.) 66 pts.; 2, H. Baldwin (F.G.A.) 65 pts.; 3, Mrs. P. Young (F.G.A.) 63 pts. Guppy (pairs): 1, D. Glen (F.G.A.) 66 pts.; 2, Miss S. Clarke (Aireborough) 53 pts.; 3, A. Charleston (F.G.A.) 50 pts. Livebearers (single): 1, B. W. Carter (Merseyside) 74 pts.; 2, J. S. Hall (Aireborough) 73 pts.; 3, P. Ebbrell (Hyde) 72 pts. Livebearers (pairs): 1, A. Bebbington (Peterlee) 67 pts.; 2, J. Healey (Village) 59 pts.; 3, Mr. and Mrs. Toyne (Sheaf Valley) 57 pts. Angel (single): 1, G. Wilkinson (Hyde) 74 pts.; 2, M. and S. Turner (Glossop) 72 pts.; 3, L. Leadbetter (Heywood) 70 pts. Angel (pairs): 1, M. Wild (Accrington) 74 pts.; 2, J. Brown (Hyde) 68 pts.; 3, J. Brown (Hyde) 64 pts. Dwarf Cichlids (single): 1, Mr. and Mrs. Whitley (Aireborough) 80 pts.; 2, P. Whelan (Blackburn) 79 pts.; 3, R. Shanks (Peterlee) 78 pts. Dwarf Cichlids (pairs): 1, R. Shanks (Peterlee) 68 pts.; 2, G. Brown (Mount Pleasant) 67 pts.; 3, L. Leadbetter (Fleetswood) 66 pts. A.O.V. Cichlid (Single): 1, P. Bowden (Stretford) 81 pts.; 2, B. and S. Wharton (Gornal) 78 pts.; 3, P. Whelan (Blackburn) 75 pts. A.O.V. Cichlids (pairs): 1, H. Hubbard (Peterlee) 80 pts.; 2, G. Dixon (Basingstoke) 75 pts.; 3, F. Thom (Village) 66 pts. Fighters (single): 1, W. Turner (Basingstoke) 74 pts.; 2, S. Clarke (Aireborough) 72 pts.; 3, J. Thompson

(Edinburgh Pondkeepers) 71 pts. Gouramies A.V. (single): 1, Miss S. Clarke (Aireborough) 77 pts.; 2, A. Ellison (Blackburn) 75 pts.; 3, Miss S. Clarke (Aireborough) 69 pts. Gouramies A.V. (pairs): 1, R. Merry (Village) 66 pts.; 2, M. Newsham (Blackpool) 64 pts.; 3, Mr. Bower (Sheffield) 58 pts. Barbs A.V. (single): 1, J. Murray (Salford) 74 pts.; 2, D. Shields (Halifax) 72 pts.; 3, D. Birdall (Aireborough) 69 pts. Barbs A.V. (pairs): 1, A. Blake (Basingstoke) 77 pts.; 2, B. Marshall (Blackburn) 75 pts.; 3, Mr. and Mrs. Stanton (Sheffield) 69 pts. Characin A.V. (single): 1, P. Bowden (Stretford) 73 pts.; 2, R. Rich (Basingstoke) 72 pts.; 3, A. Jackson (Village) 71 pts. Characin A.V. (pairs): 1, D. Binson (Basingstoke) 71 pts.; 2, A. Waterhouse (Sandgrounders) 70 pts.; 3, R. Bell (Edinburgh Pondkeepers) 68 pts. Carps or Minnows (single): 1, G. Brown (Mount Pleasant) 79 pts.; 2, A. Baldwin (Nelson) 77 pts.; 3, A. Buckley (Bury) 76 pts. Carps or Minnows (pairs): 1, A. Moss (Huddersfield) 75 pts.; 2, A. Buckley (Bury) 71 pts.; 3, A. Youngston (Lanarkshire) 65 pts. Catfish A.V. (single): 1, B. W. Carter (Merseyside) 77 pts.; 2, L. Leadbetter (Fleetswood) 76 pts.; 3, P. T. Richardson (Merseyside) 73 pts. Catfish A.V. (pairs): 1, R. Davies (Belle Vue) 78 pts.; 2, D. Jamieson (Lanarkshire) 74 pts.; 3, I. Scott (Edinburgh A.S.) 73 pts. Egg-laying Toothcarps (single): 1, H. Marshall (B.K.A.) 77 pts.; 2, A. Beasley (Bury) 75 pts.; 3, B. Forrester (B.K.A.) 67 pts. Egg-laying Toothcarps (pairs): 1, 2 and 3, Mr. Sumburg (B.K.A.), Loach A.V. (single): 1, P. T. Richardson (Merseyside); 2, D. Turnbull (Mount Pleasant) 70 pts.; 3, D. Grogan (Accrington) 65 pts. A.O.V. (single): 1, S. Heap (Belle Vue) 82 pts.; 2, J. S. Hall (Aireborough) 74 pts.; 3, P. Whelan (Blackburn) 67 pts. Breeders (Egg-layers): 1, H. Christie (Lanarkshire) 80 pts.; 2, H. Christie (Lanarkshire) 77 pts.; 3, S. Birtley (Huddersfield) 64 pts. Breeders (Livebearers): 1, B. Williams (Lanarkshire) 67 pts.; 2, Miss S. Clarke (Aireborough) 65 pts.; 3, R. Shanks (Peterlee) 60 pts. Breeders (Coldwater): 1, W. H. Ramsden (N.G.P.S.) 76 pts.; 2, B. M. Rothwell (N.G.P.S.) 75 pts.; 3, W. H. Ramsden (N.G.P.S.) 72 pts. Plants A.V.: 1, A. Beasley (Bury) 78 pts.; 2, M. Ross (Lanarkshire) 71 pts.; 3, D. Glen (Bury) 69 pts. Marine Furnished Aquarium: 1, British Marine Cheshire and N. Wales 70 pts.; 2, British Marine Cheshire and N. Wales 64 pts.; 3, British Marine Cheshire and N. Wales 61 pts. Marine Fish (single): 1, S. Wolfenholme (Heywood), 76pts.; 2, P. Armstrong (Heywood) 75 pts.; 3, Mrs. S. Glen (Bury) 60 pts. Best Fish in Show: 1, S. Heap (Belle Vue) 82 pts. Best Tropical Fish: S. Heap (Belle Vue). Best Coldwater Fish: W. H. Ramsden (Belle Vue) 79 pts. Most attractive stand: 1, Edinburgh A.S.; 2, Bury A.S.; 3, Lanarkshire A.S.; 4, Village A.S. Society with Four Highest Pointed Awards: Northern Goldfish, Individual Exhibitor (Most Awards): W. H. Ramsden, Northern Goldfish, Exhibitor Most Cards (Breeders Section): H. Christie (Lanarkshire).