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Comments and Quotes

**Need for research into white spot ●
Electricity Board's new river ● Under-
water tours by bubble car ● Cost of
living food ● Danger in the rivers ●
Water Plants from chemicals**

Can there be Immunity to White Spot?

LETTERS that have appeared in *PETFISH MONTHLY* in preceding issues, and discussions we have had with fish-keepers, have emphasised that a number of experiences do not appear to be explicable wholly in terms of our present knowledge of the life history and susceptibilities of the white spot parasite. One aspect that does need pointing out, however, is that the 'white spot' about which all the books warn the aquarium beginner is sometimes blamed when the real cause is something different. For example, newly imported tropical fishes are occasionally seen which show a few, perhaps three or four, whitish spots on their fins, spots that are larger than those developing with the true white spot disease, and which do not increase in number and do not appear to be of an infectious nature. Such a condition could not be confused with 'white spot' by anyone who has seen the effects of this although without such knowledge it could be falsely identified.

The main point of controversy about ichthyophthiriasis ('white spot') concerns whether or not it can be present in a tank without the fish showing any signs of infestation. Circumstances which in particular have led to the suspicion that it can be arise after some treatment has been applied to an obviously infested tank. The infested fish are

cleared but, it is often reported, new fish placed in the tank later on show the characteristic signs of infestation soon afterwards. An explanation, which we have not seen put forward before, could be that the white spot parasite is one to which fish can develop resistance—that is, immunity.

If this were so, it may be that the use of some kinds of treatments for white spot, which do not completely eliminate the parasites either because they are really inadequate to do this or because they are improperly applied, can allow the acquisition of such an immunity. The 'treated' fish would afterwards remain clear but unaffected parasites would still be present in the tank.

It is only in recent years that the development of immunity to protozoan parasites by animals has been demonstrated, and as yet knowledge of the mechanism and of the extent of this happening is scanty. It is also something that can be convincingly proved only by painstaking and carefully controlled experiments. The correspondent who asks on our Letters page 'who is expected to do the research into this?' obviously thinks it is high time that 'white spot' received some further detailed investigation of this kind, and a good many other fish-keepers think the same.

River in the Laboratory

IN the newly established biological laboratory of the Central Electric-

city Generating Board at Leatherhead, Surrey, one of the special facilities provided is an 'artificial river' containing barbel, perch, roach and bream. The advantages of this are that fishes can be closely studied under various conditions that resemble those likely to occur in a natural river, but with everything in it under the control of the Board's biologists. Results of the studies will find application in the design and operation of power stations situated on rivers.

Tours beneath the Sea

DO you fancy the idea of a sight-seeing trip beneath the sea? If your holiday travels take you to Marseilles it is possible that you might get the chance, according to this report (from the EVENING NEWS) of an experiment being made there this year.

'A 550-yard cable is being strung between a winding station and an anchor point about 30 feet under water, at a locality where the fish and the corals should be plentiful and interesting.

'Hung on the cables will be bubbles of transparent plastic, big enough to hold two people each in comfort, made of the same tough clear material used in aircraft windows.

'The difference is that the bubble-car is likely to float above the holding cable, instead of hanging from it like a teleferic. If anything jams or goes wrong, you will not fall out; your car can be unhooked, will then float quietly to the surface.

'Breathing! No difficulty, with compressed air cylinders, or perhaps a pipe linking each bubble with a pumping station.

'The installation has been designed around plans drawn up by a former French ski champion, and the parts will be made by a firm specialising in teleferics and ski-lifts. The Marseilles experiment is being watched with interest by other Riviera authorities'.

Cost of Living Food

ARE movements afoot to form a Union of Daff-Catchers and 'Tubi-

Collectors? Perhaps this is what lies behind an appeal for a get-together advertised in a pet trade magazine by John Eserin of Aquaculturists Ltd., who is responsible for distributing the pink bags of live water fleas sold by pet dealers throughout Britain. If your portion of *Tubifex* for sixpence looks even smaller than usual or your bag of *Daphnia* jumps in price you'll know that 'agreement has been reached'. If the Prices and Incomes Commission wants to know we'll speak up on the side of those who brave all weather to bring in our live foods.

Actually there is a precedent for high-level consideration of the affairs of daff-catchers. In Berlin last year the Western Zone made it illegal to catch water fleas in the rivers and lakes of the city. Special permission was thereupon sought by the thwarted daff-catchers to go to the Eastern Zone to make their catches on that side of the Berlin Wall, and the East Berlin authorities eventually agreed to issue passes for this purpose. We imagine that there was a steep rise in the price of *Daphnia* after that, because the concession was given only in return for 10% of all the profits!

Danger in the Rivers

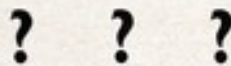
BE extra wary about taking river fishes or plants for your garden pond. An unidentified disease, believed possibly to be the same one that has caused the disastrous losses in the salmon rivers of Ireland over the

past 18 months, is spreading among fish in lakes and rivers in the midlands. Roach have been dying by the thousand with extensive skin damage.

Columnaris disease is the one suspected, just as it has been in Ireland, but so far the experts on the fisheries and river boards have not made a sure diagnosis. This disease is not unknown in aquarium fishes and was described in PETFISH MONTHLY by Dr William Stokoe in his article in our May issue.

Water Plants from Chemicals

READING an article on large-scale hydroponics (the use of chemical solutions instead of soil to grow vegetables and flowers) now being used in Israel has reminded us that the adaptation of this approach to grow specimen water plants is something we have been treating to try out for a long time. If land plants do well when chemical solutions are irrigated around their roots water plants might benefit greatly by growth in similar solutions. A problem that would undoubtedly arise would be the always troublesome one of algae, for these would certainly benefit as much as the plants from the rich artificial supply of nutrients. This method would, of course, be strictly for the purpose of producing robust plants for transfer to aquaria, for the solutions would not be suitable for the keeping of fishes.



Green Water

On reading the article 'The Importance of the Right Water' by D. B. McInerney (PFM for May), I decided to collect rainwater in our enamel bath. The water, which collected in a few hours, had a slightly greenish hue and I would like to know if this means that the water is unsuitable.

Rainwater freshly collected should be colourless. If, however, your

enamel bath had previously contained some water in which algae had grown this would undoubtedly cause a slight green colour. In addition, the water would develop algae quite quickly in bright light. However, provided that the colour arises only from this source the water will be quite suitable for fishes. It is assumed that the bath was quite clean to start with and has no brass fittings that could have contaminated the water. Contact with metals would, of course, render the water unsuitable for your purpose.

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LETTERS

Anything New about White Spot?

IN your first issues you have published letters from readers raising problems with regards to white spot laying dormant in a tank and apparently only affecting new additions. In both cases your writers are giving credit to the suppliers of the new fish by saying that their tanks appear clean, and yet suspect their own tanks as carrying the dormant disease. This rather surprises me!

In my own experience over the years I have had to deal with white spot twice, and on both occasions shortly after buying new fish. The last occasion, the new fish themselves were not affected but a pair of my own *Capeina arnoldi* were. Surely the fish with the softest fins or scale formation would be expected to be affected first, and this would explain why one type and not another are infested first.

All the letters that one reads finish up with a query which never seems to be answered or even attempted to be answered, and this is surely a very bad thing as white spot is rather a curse of our hobby. What worries me is who is expected to do the research into this? Whoever it is taking a heck of a time as my own memory of this goes back now at least 27 years. I rather suspect that the suppliers of chemical cures are not worried about dormancy as visible results are their main objective.

Would it be possible to have a few comprehensive articles on this disease and then make space available for readers to give their own experiences? Perhaps Dr William M. Stokoe would handle this (and I would like to compliment him on his excellent articles but may I be so bold as to say that he seems to me to be taking the least important first and those that I would not term a scourge).

In closing may I say that the first attack that I experienced some years ago nearly disheartened me enough to give the hobby up but I 'survived'; yet it makes me wonder how many have given up owing to an early attack of white spot.

Strensage, Herts.

R. A. NEWMAN

Interesting but too Elaborate

THE article by Thomas Behne entitled 'Marine Hobbyist's Dreamland' (PETFISH MONTHLY, June) was one I read with mixed feelings. While it made interesting reading it certainly won't encourage newcomers to the marine hobby, which is a great pity. Such an elaborate arrangement of water circulation and filtration is, I must emphasise, unnecessary for the correct maintenance of a marine tank (even a 200 gallon tank). The tank in the article is filtered by two pumps, each turning over 475 gallons per hour—a total of 950 gallons every hour in a 200 gallon tank. This means the tank water is

cleaned and circulated roughly five times every hour. Excellent! But this is achieved just the same with a 24 in. by 12 in. by 15 in. tank, using an Eheim power filter. With synthetic salt and a power filter incorporating ion-exchange filter medium one is on the road to success.

Of course, Mr Horst Kipper, who owns the set-up referred to in the article, has covered every conceivable avenue for success, but I'm sure the majority of hobbyists will shudder at the thought of such a paraphernalia of equipment. One would have to be as interested in electronics as well as marine fish to contemplate such an arrangement. I know that the article does not infer that such a set-up is essential for success with marines, but I feel that to anyone whose thoughts are progressing towards this branch of the hobby such an article might deter them. Hobbyists who have already had some success with marines, of course, know that Mr Kipper has gone to extremes. 'Marine Hobbyist's Dreamland' is surely a misnomer. How can one enjoy keeping the beautiful coral fishes that are available if the tank is dwarfed by a huge wall of electronic devices that would do justice to a Fleming novel?

Finally let me congratulate you on such a well laid-out and authoritative magazine, which I feel is the shot in the arm needed in the aquarium hobby. More power to you.

Craigton, Glasgow

F. MCMENAMIN

Evaporated Milk for Fry

CONCERNING the letter 'The Milky Way' (PETFISH MONTHLY for June), I am afraid the writer omitted to state either the size of his friend's tank or that of his own tank in which he tried the evaporated milk experiment (accidental or otherwise). I personally tried it in a 12 in. by 8 in. by 8 in. tank, but to be on the safe side I put in a quarter-teaspoon of milk. However, I am afraid that the six baby guppies I tried it with were all dead in two days! I also tried it with one fry in a 2 pint floater with just two drops of milk, but I am sorry to say it had the same effect; the fry died within two days. Therefore I would be sincerely interested to hear if anyone had better luck than I had, or if I personally went wrong somewhere.

Leeds 8

MRS P. MCCOURT

Persevere with the Sharks

HAVING read Mr E. Broadbank's observations on Red-tailed black sharks in April's PETFISH MONTHLY, I thought I must write this letter before he gives them up as 'goners'! I am very interested in these curious fish and I have reared several quite successfully.

I do not think this grey colour is their natural colour as inferior specimens; when young they are always of a pale drab colour. My own sharks when I bought them were small and grey and orange in colour. Perhaps it is the lack of a full diet which pales their colour. The shippers do not give the sharks much food before they are transported and they lose colour rapidly in such a state. My own have eaten everything I have given them—daphnia, tubifex and white worms, as well as their

natural algae. They even take dried prepared food from the surface. A few water lice are not against their dietary inclinations.

One curious habit I have noticed that may, perhaps, be of interest: each shark would choose some territory and would eat his food there—and only there—driving other sharks away. I hasten to add they are not bullies, they do not hurt one another and they are in fact very peaceful fish. One chose a large rock, another chose the thermostat and a few plants. One even chose the heater; perhaps he liked his food cooked!

I hope Mr Broadbank has not been permanently 'put off' these fascinating fish and I am sure he would enjoy watching them grow and thrive. When they are big enough and bright enough he could win a few cups with them. So my advice to Mr Broadbank is—go out and buy one!

Liverpool 14

G. BIRCHENOUGH

Leadership Required

I HAVE been requested by my own Committee to write to you regarding the Federation of British Aquatic Societies and the letter from Mr G. H. Jennings in your May issue.

It has been quite obvious to us that the F.B.A.S. has for some years been masquerading under an assumed name. The British aquarist does in fact exist farther afield than in a circle of 20 miles radius of Charing Cross. Does the F.B.A.S. appreciate this? Not on your nelly—neither do its judges or lecturers apart from one or two notable exceptions.

It must be admitted, though, that on occasion the dense mists surrounding our circumscribed area do in fact lift for a while, allowing the F.B.A.S. to perceive a wider horizon—we then get a request for subs!

So what can we do? Clubs in a particular area get together and form their own affiliations, appoint their own judges, make up their own standards and make up a list of their own speakers. After all, we must get judges and speakers from somewhere to remain viable.

We feel therefore that either the F.B.A.S. should get back on the ball and show some leadership, produce lists of judges and speakers (defining the area over which they are prepared to travel), bring out new standards to include the many new fish we see about us and generally make it apparent that they are in fact the Federation of British aquarists, or they should admit that the whole thing is too big for them, haul down the flag and leave the existing groups to try to co-ordinate their activities, as Mr Jennings suggests, as best we may.

Or is that how it all began?

G. C. B. THOMPSON,

Secretary, Three Counties Group Aquarist Society

Simplified Brine Shrimp Hatching

SO much has been written lately regarding the hatching of brine shrimp that I have been tempted to write to you on this subject. As a breeder and a shower of fancy guppies, I use quite a lot of this very good food for my fish.

Like the majority of fishkeepers in this country, I haven't much time to mess about with fancy concoctions to hatch brine shrimp, and use this very simple and cheap method.

Take one 4 in. by 4 in. show jar, fill it to the neck with water at 75°F (24°C), sprinkle enough eggs to cover the surface, allow to stand for 90 minutes—this softens the shells—and then add the salt. I use crushed block salt, and find it the cheapest and the best. The amount of salt that is used is the deciding factor of your success: the correct amount to use is 3 level teaspoons to a pint of water. As the show jar holds about 2 pints you must add 6 teaspoons, no more and no less. Stand the jar in a reasonably warm place, and vigorously aerate for 24-36 hours and you will be amazed at the hatch you will get.

I would be very interested to hear from anybody regarding this method. If you want to be amongst the winners at any show, then you must feed brine shrimp to your young fish from a very early age.

Congratulations on your very fine publication, it makes a change to see a good British magazine available to aquarists.

London, S.E.16

A. W. GOODALL

PETFISH MONTHLY's aerator prize this month has been sent to the writer of the above letter.

Specimens Wanted

FISHES showing tumours and deformities are required for laboratory investigations, and fishkeepers having specimens that show these abnormalities can help by sending the dead fish for examination. Fresh material or bodies preserved in dilute formalin should be enclosed in a polythene bag and sent to Dr L. E. Mawdesley-Thomas, Department of Histopathology, Field Station, Huntingdon Research Centre, Hartford, Herts.

Prize Letters

TO the writer of the letter judged by the Editor to be specially worthy among readers' letters published in each month's issue, PETFISH MONTHLY will award a prize of a well-known make of aquarium aerator (as pictured here).



PETFISH MONTHLY will be glad to have your experiences, comments, suggestions etc. in letters on any matter associated with fish-keeping. Write to the Editor, PETFISH MONTHLY, 554 Garratt Lane, London, S.W.17.

Two Ready Breeders from China



Photo: G. E. WOODWARD

A quartet of *Aphycypris pooni*: the male fish is the one on the extreme left

TWO Chinese tropical fishes that are very similar in appearance are *Aphycypris pooni* and *Tanichthys albanus*. The first is seldom seen in British aquaria, and in fact it is said that pure *pooni* no longer exist in captivity.

Owing to its free hybridisation with the White Cloud Mountain minnow, it is a possibility that the fish offered for sale under the name of *A. pooni* is not a pure strain, but a hybrid of the two species. There is such close similarity that to the unpractised eye they would be classed as one and the same fish, but on closer observation several differing features can be noted.

By H. E. R. THOMPSON

The *pooni* (or venus fish as it is sometimes named) is of a lighter shade altogether; the dorsal fin is of a deeper red at the base, fading to yellow at the outside, while the White Cloud minnow dorsal is pale at the base, deepening to bright red towards the outer edge; the dorsal of the male *pooni* carries a more clearly defined margin of pale blue. A gleaming band of blue-green extends from mouth to base of tail in both species; this band tends to fade with age and later becomes a

golden colour. The belly is white to silver.

In China both species are found around the area of Canton; *pooni* to the east of Canton and further south in Hong-Kong, and the White Cloud Mountain minnow in the gorges of the White Cloud Mountains from which it derives its name. Although the *pooni* is rare in our aquaria, the White Cloud minnow is common among aquarists and a firm favourite with most. A wide temperature range is tolerated, as would be expected with fish coming from the high ground of a mountain range; temperatures from 40° to 90° F (5-32° C) bring no harmful

results provided the change is brought about gradually and with only short times spent at the extremes. The best and most comfortable temperature, however, is from 68° to 74° F (20-23° C) and fish will live happily and breed readily within this range.

Both species are free breeders and good broods of youngsters can be obtained with either of the following methods. (I would mention here that, in my experience, the pooni is more likely to eat eggs and fry than the White Cloud minnow and it would be interesting to know if other breeders have found this to be so). A 24 in. by 12 in. by 12 in. tank is best suited, filled to a depth of 6 in. with fresh water: pH and hardness are of no importance, provided extremes are avoided, as neither fish has special requirements this way.

A fairly dense spawning medium should be provided of coconut fibre or willow root (boiled before use) and up to a dozen breeders introduced, two females to each male if possible. Of course, both species may be bred in pairs, but being community breeders more chance of success is obtained if a shoal is used and naturally more fry are produced. Breeding will commence

within a day or two and usually a few eggs are deposited at a time, which means that a dozen or so fry will hatch every day: let this continue for a week or 10 days, when a useful number of babies will have hatched, numbering between 100 and 150.

Now carefully move the breeders to a second tank set up in the same manner and registering the same temperature, where, all being well, the spawning will continue. Two, three or more broods can be produced in this manner if the necessary space is available to cope with the youngsters later. By breeding in this manner there will be quite a difference in the sizes of the first hatchings and the last, and this simplifies the feeding problem: while the fish in the first free-swimming stage are taking Infusoria or egg yolk, the next size up are taking brine shrimp, while the larger babies have been weaned to dry food and mashed white worm or Grindal worms. This form of breeding is recommended if a large quantity of fish is required.

The other method is to set up the breeding quarters as before, but to move the fry as they become free-swimming, by spooning them into an identically set up tank of larger dimensions. No harm will

result to the tiny fry if the temperature is the same and feeding can then be commenced in the nursery tank. This method is preferred if only one brood of young is required.

The babies can be left in the tank with the breeders if no other tank is available: I have reared the babies with the parents many a time and although I suspect that some eggs and fry are eaten, usually enough are left to satisfy the breeder and, as I intimated before, more success here is likely with the White Cloud minnow than the pooni.

Both the pooni and the White Cloud Mountain minnow are most accommodating and pleasing little fish, and whichever breeding method is adopted results are usually obtained. The sight of a brood of tiny fish resembling young neon tetras makes the effort worthwhile.

When adult, both fish are given to shoaling, and a group of six or more in a mixed tank makes a pleasing sight. They are omnivorous and feed very readily on a diet of dried and live foods, provided it is of a suitable size for their rather small mouths. To sum up, both species are fish very much to be desired and one or the other should be included in every fanciers' stock.

PETFISH photo competition

Closing date 31st October



ENTRIES to our Photo Competition from Mr J. Turner (blue acara, above) of Burntisland, Fife, and from Mr F. McNaughton (*Hemigrammus pulcher*, left) of Dundee are shown here. Both of these entries are reproduced from colour transparencies, and entries in this class have been the most numerous ones received so far. These readers receive one guinea each, and are still eligible in the final judging for the main prizes after the closing date (31st October).

Have You Thought of Using Wood for Making Aquaria?

asks **D. A. READ**

(Weston-super-Mare and District Tropical Fish Club)

IN the past, because of its many advantages over the conventional glass and angle-iron tank, many people have attempted to build fish tanks in wood of various sorts, with varying measures of success, and mainly in only small sizes. Through the use of the more modern materials now available I think that I have constructed the perfect wooden aquarium.

The two main materials used were chipboard, a multitude of wood shavings or chips held together with a plastic based adhesive, and polyurethane liquid plastic, used to make a hard, waterproof envelope firmly bonded to the inside of the chipboard frame.

As a test for my ideas and theories I constructed a tank of fairly substantial size, which was 30 in. by 15 in. by 15 in. The building cost, including a hardboard hood, was about £2 15s, which means that the additional cost for lighting, switches, heater, thermostat and undergravel filter cost me the price of a basic angle iron tank of the same size.

I will now describe how I constructed the tank, the design of the hood being left to the individual.

Materials

- 3 pieces of 30 in. by 15 in. by $\frac{1}{2}$ in. chipboard of good quality.
- 2 dozen 2 in. no. 8 screws for the main tank (preferably non-corrosive).
- 2 dozen 1 in. no. 8 screws for the glass frame attachment to main tank.
- 1 small tin of waterproof glue (such as Cascamite).
- 1 lb. tin of aquarium glazing putty.
- 1 small tin of coloured dye or stain if required (not oil-bound).
- 1 pack (plastic and hardener) of a good brand of polyurethane (I used 'Clear' Black Friar).
- 7 ft. 6 in. of 2 in. by 1 $\frac{1}{2}$ in. hard-

Modern materials for the woodworker provide the means of constructing serviceable fish tanks that can readily be adapted to individual requirements of size and shape and with built-in fittings

wood strip with $\frac{1}{2}$ in. centre channel for glass.

Quarter-plate glass to fit, approx. 26 $\frac{1}{2}$ in. by 12 $\frac{1}{2}$ in. max.

3 ft. of 2 in. by $\frac{1}{2}$ in. hardwood on which to hinge the hood.

Tools

Drill with $\frac{1}{8}$ in. bit and countersink.

Screwdriver.

Cross-cut or tenon saw.

Set-square.

Fine-bristle paint brush.

Fine sandpaper.

Construction

First cut the chipboard to size. One piece 30 in. by 15 in. is to be the base, another the back and two pieces 14 $\frac{1}{2}$ in. by 14 $\frac{1}{2}$ in. for the sides. Check that all corners are square.

If the inside of the tank is to be coloured this should now be done with stain or dye, but do not use paint as this will later blister. When dry this surface should be finely sandpapered to a smooth finish, taking care not to round off the edges.

Drill and countersink round three edges of the base and the two side edges of the back at 3 in. intervals, $\frac{1}{2}$ in. from the surface edge.

Now mix sufficient of the glue at the recommended strength to cover the back bottom edge and the two side bottom and back edges.

Fit the back to the base with three or four holding screws, push the sides firmly in position and screw

to hold. Put in the rest of the screws and systematically tighten. String or wood of the correct length tacked to the two top front corners will keep the two sides parallel while the glue sets.

Cut the channel hardwood into two 29 in. lengths and two 11 $\frac{1}{2}$ in. lengths and with three of these glued and screwed in position make a frame round the front inside edge of the chipboard tank ready for the glass.

After making sure that all inside surfaces are smooth and free from dust, fit the 2 in. by $\frac{1}{2}$ in. hardwood strip between the two sides and joined to the protrusion of the back above the two sides. This can then be drilled for the insertion of electrical cables, air-lines etc.

Mix part quantities of the polyurethane and apply it with a soft brush to give several coats over the complete inside of the tank, including the glass frame, the loose piece of glass frame and the inside of any cable holes etc.

The glass can now be cut to size and fitted into the glass frame with the aquarium putty. The top of the glass frame is then screwed into position and excess of putty removed.

It now only remains to paint, paper or in some way decorate the exterior of the tank and to build the hood. It is suggested that the underside of the hood can be covered with Polyglaze to protect any electrical elements from condensa-

tion, provided that sufficient outside ventilation is made available.

The Tank in Use

My test for the strength of the chipboard aquarium consisted of putting the tank in use complete with water, gravel, rocks and fish for 9 months, supported only around the tank's outside edges. At the end of this time the base, back and sides were examined and found still to be absolutely flat. However, support for the base is recommended, if only for peace of mind.

The polyurethane dries to a very hard, smooth surface, giving good adhesion for suction pads and from which algae is easily removed. The hardness is best demonstrated by the television advertisement in which a fork does not scratch this surface.

Below is a brief list of the main advantages of this tank compared with a conventional angle-iron tank.

1. Extremely slow heat loss, mainly through glass front.
2. Nothing to rust.
3. Suitable for saltwater and marine fishes.
4. Strength (it will take knocks, except to glass front).
5. Cheap on electricity, gas or what-have-you.
6. Cover can be hinged, cables can be stapled, shelves can be attached.
7. Cheapness of construction.
8. No extraneous light.
9. Shape and size to suit individual requirements.
10. Old mirror glass can be used in one piece to make a bigger tank.

Two possible disadvantages are that it is difficult, but not impossible, to adapt for an outside thermostat and the tank is slow to respond to space heating. These are not considered serious as they would merely take more time either in the con-

struction or initial setting up of the tank.

Conclusions

From the above it can be seen that there are far more advantages than disadvantages to this type of tank. As chipboard can be cheaply and easily bought in standard sizes up to 10 ft. long in varying thicknesses, tanks can be built as big as required and the bigger the tank the more money saved over an all-glass tank.

With only a few basic tools this tank is easily built by the average handyman, who can later alter the size to suit himself or even convert the whole thing into a wall cupboard should he so desire!

I am continuing my experiments by building a much larger tank and if any keen fish-keeping handyman wishes to build a tank which is also a piece of furniture, then I would suggest that the foregoing may be of some practical use.

BREEDER'S NOTEBOOK

Success with the Cardinal Tetra

By J. LEE

VERY few breeders are having success with cardinal tetras (*Cheirodon axelrodi*) as far as I know, despite the fact that breeding it is an ambition of so many. This account is of my first successful spawning of this fish, given in the hope that it will provide encouragement to others.

The tank used was 18 in. by 12 in. by 12 in., the sides, bottom and one end of which were painted black, leaving one end clear. Then the tank was thoroughly cleaned and disinfected with a strong solution of potassium permanganate, which was allowed to stand in it for about 1 hour. Then, after it had been well washed out, it was placed in a dark corner of the fish house. Next came the tricky part. What water to use!

After quite a lot of thought I used about a 5 in. depth of pure rainwater (which I filtered). This had stood in an old tank over the months, going slightly acid as there was a 2 in. layer of oak leaves at the bottom of the butt. To the tank I then added a thin layer of dark boiled peat moss and topped up with about 1 in. of tap water (neutral where I live), bringing the depth of the water to just over 6 in., and I added to this a little rock sea salt. This was allowed to stand for a week, when it was tested for reaction, which was pH 4.5 to 6.8, acid. The water hardness I was unable to test as I had no kit at that time.

The cardinal tetra scatters adhesive eggs about

bushy plants but I did not use plants for the spawning medium. I used instead willow roots that had been thoroughly boiled and rinsed. I placed these in a nice large clump in the tank, opening it in the centre with a few holes so that the fish could swim through easily. The temperature ranged between 72° and 76°F (22-24°C). Next I put in the pair of cardinals.

I was out all day and I think they started to spawn in the early morning. When I went to the fish house a little sunlight was reaching the clear glass and I noticed that both fish were very excited; I covered the top of the tank and part way down the glass to within 1 in. of the bottom with some dark brown paper. That night, when I looked, to my delight the female was slimmer and they had spawned.

After removing the parent fish and waiting a few days I saw the fry. A week later I cut a long slot in the top of the brown paper to let a little light in to get the fry used to it gradually. They were fed on Infusoria and Liquifry (for egg-layers) for a few days.

I next started to give a small portion of brine shrimp to the fry, which were now moving quite lively about the tank. A few days after they started to take micro worms, and feeding with these continued until they were big enough to go on to Grindal worms and sifted daphnia. Then after that, it was plain sailing as the saying goes.

STANDARDISATION OF VARIETIES OF GOLDFISH—3

The Deep-Bodied Goldfish

By M. D. CLUSE

Vice-President, The Goldfish Society of Great Britain

WHEREAS the wild goldfish and the common goldfish of commerce have slender bodies, some of the first fancy goldfish to appear possessed deep and rounded bodies. To encourage the production of the extreme form of this genetical variation it is desirable to give an indication of what is acceptable on the show table. This can be done by producing diagrams and by stating the proportions of the fish by relating various parts of the anatomy to each other.

It is convenient to use the length of the fish, from the tip of its snout to the end of its body not including the tail fin. For the slim-bodied singletail, the Goldfish Society of Great Britain has produced a standard wherein the depth of the body at its deepest part is about two-fifths of the length of the body (2/5L). The standards for deeper-bodied fancy fish call for a depth of body three-quarters of the length of the body (3/4L) (see Figs. 1-3).

It is interesting to note that the deep-bodied fish has not just been pushed in fore and aft by Nature but has other associated genetical adjustments. For example, whereas the count of scales along the lateral line of the singletail usually varies from 28 to 32, in the twintail (veiltail) the count is about 25. Also the swimbladder of the deep-bodied fish has become modified, so that the

animal can retain its balance even when endowed with long finnage.

To preserve certain special characteristics the Goldfish Society has concentrated on three of them in conjunction with deep-bodied fish and so arranged them that interbreeding would produce mongrels not accepted for exhibition purposes. Each of the three varieties must have divided or twinned caudal fins and double anal fins. The twintail (veiltail; Fig. 1) should have a large dorsal fin with the upper edge convex and the front edge should be two-thirds of the length of the body (2/3L). The caudal fin should be long and on a good fish it would be 1 1/4L. The special feature difficult to attain is the 'square-cut' outer margin, which should be as free from 'forking' as possible.

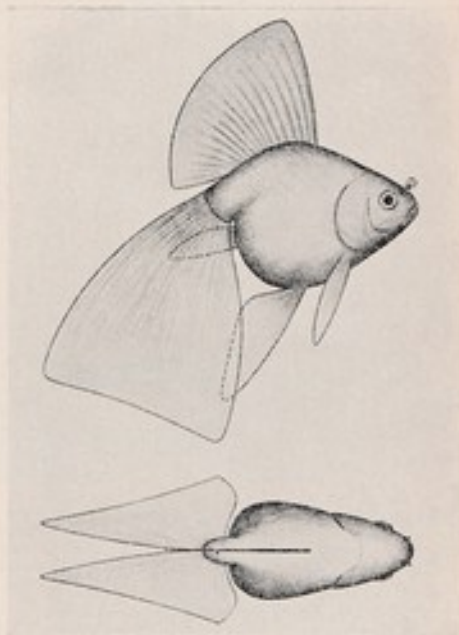


Fig. 1
Twintail (veiltail) goldfish

The globe-eye (Fig. 2) should have pointed finnage, a straight or concave upper margin to the dorsal fin and a sharp forking in the caudal fin. This is to discourage interbreeding with the twintail (the length of the fins in relation to the body are the same as for twin-tails.) The special characteristic, however, is the shape of the eyes, which should protrude markedly from the head. These eyes are often described as telescopic, which is untrue as regards optics.

The colours of the nacreous or matt types of globe-eye are much the same as for any other variety but the metallic type is usually a deep velvety black all over, which is much sought after. Such fish are generally known as 'moors'. A peculiarity of this blackness is that it is practically never found except

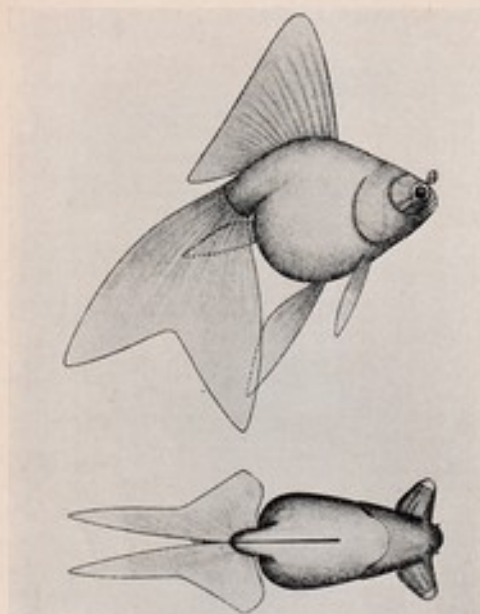


Fig. 2 (above)
Globe-eye gold-
fish

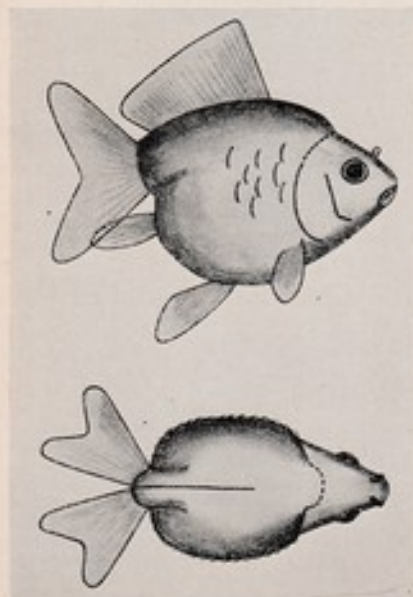


Fig. 3 (left)
Pearl scale
goldfish

in conjunction with protruding eyes. This blackness can change to orange or even silver, especially if the fish are kept in warm water. A fish showing bronze on the belly is down-pointed and this is a factor that sometimes comes with age.

The Goldfish Society's general rules for pointing allot 19 marks for colour. As regards the metallic group 14 marks can be gained for orange or yellow, whilst silver or black gain up to 5 marks. In the nacreous or matt groups the marks are 9 for the highly regarded blue, 5 for orange or yellow and 5 for black. However, as black is so attractive and so closely connected with the globe-eye, 19 points for blackness can be awarded in the metallic groups and orange or silver gain no marks at all in this grouping.

The pearl scale (Fig. 3) is a short-finned deep-bodied fish. The front edge of the dorsal fin should be a third of the length of the body (JL). The length of the caudal fin should be two-fifths of the length of body (JL). This tail fin should 'perk up' well. The special characteristic of the pearl scale is the 'dorning' of the scales, hence the name.

These three deep-bodied twin-tailed goldfishes cover between them three types of finnage shape, normal eyes, protruding eyes, normal scales, domed scales and also the special blackness factor. It is difficult to obtain a good percentage of offspring from these varieties with the fancy genetical factors present. It is undesirable therefore to crowd any more genetical factors on to the three varieties.

(Diagrams used with this article have kindly been provided by the Goldfish Society of Great Britain)

Readers' Queries

QUESTIONS on fish-keeping from readers of PETFISH MONTHLY will be answered by post if accompanied by a postage-paid addressed envelope for reply. A selection of answered questions will be published each month. It is regretted that queries cannot be answered by telephone. Address letters: Readers' Advisory Service, PETFISH MONTHLY, 554 Garratt Lane, London, S.W.17.

Why Do Glowlights Glow?

By A. FRASER-BRUNNER

Although such a well-observed and eye-catching feature of aquarium fishes much remains to be discovered about their iridescent coloration

AMONG the most popular fishes available for the home aquarium are those which appear to be illuminated, as though they are carrying electric light around with them. This effect is to be seen in several families of fishes, both marine and freshwater, but is most familiar among the characins, particularly of the genera *Hypheosbrycon*, *Hemigrammus* and *Chirodon*.

The nature of this illumination is sometimes a puzzle to fishkeepers and very recently a friend of long experience asked me whether any 'phosphorescence' was involved. My answer had to be 'no', for although a number of fishes and other animals, especially in the deep sea, glow in the dark, this phenomenon is not due to phosphorus; the word to be used for such light is 'luminescence'. But in any case, the gleam of a characin such as a neon fish is not due to luminescence. Whether there is any fluorescence, such as that to be seen on various road-signs and advertisements at the present time, has not, so far as I know, been determined; it is not impossible but, I think, unlikely.

Beacon Fish the First

The first 'illuminated' fish to become available to aquarists, in 1920, was *Hemigrammus ocellifer*, popularly known as the beacon fish or, in America, by the more cumbersome name head-and-tail-light fish. This has a gleaming red patch on the upper part of each eye, like a pair of headlights and a similar patch, or rear-lamp, at the root of the tail fin. A more recent introduction (1925), *H. erythrozonus*, the glowlight tetra, has these two points connected by a gleaming red stripe along each side of the fish.

In 1934 a species was discovered in the upper reaches of the Amazon that set the aquarium world agog. It was only an inch long but was nevertheless one of the most spectacular introductions of all time, for in addition to a strikingly red and white underside it had an intensely brilliant strip of blue-green 'neon lighting' along its back. The red, white and blue effect led to many suggestions as to name—emerald fish, tricolor fish, coronation fish and so on—but eventually the title neon fish or neon tetra won the day. Its scientific name is *Hypheosbrycon* *semita*.

Much more recently (1956) a rather similar fish has been discovered, in which the whole of the underside is red. This is the cardinal tetra, *Chirodon axelrodi*.

These, the most striking examples of a phenomenon that is seen to a lesser degree in a number of other characins, will serve to demonstrate the nature of the 'illuminated' effect.

The question whether there is any luminescence is easily settled by observing the aquarium in the dark.

The neon fish or beacon fish will then be no more visible than any other. Nor has any fluorescent effect so far been found by the use of 'black light'.

Clearly, then, the whole effect would seem to be due to the reflection of sunlight or the top-light of the aquarium. That this is so is indicated by the fact that the stripe of a neon-fish appears blue in daylight but green when seen under tungsten light, which is more yellow than daylight.

Pigments and 'Mirrors'

It is, however, interesting to discover how this reflection is brought about in the body of the fish. If the temperature of the aquarium water is reduced, the 'neon' strip becomes less brilliant and it will be seen that the red patch below the tail tends to fade also. We know that the red colour is due to pigment contained in special cells (chromatophores) which respond to the light and warmth of the sun; therefore the fading of the colour can be attributed to the contraction of these cells and the withdrawal of the pigment to their centres, so that, occupying a much smaller space, it is less visible.

From this we may guess that the fading of the 'neon' strip has something to do with pigment also.

The white part of the body does not change; there is no white pigment, but instead a large number of little plate-like bodies called iridocytes that serve as mirrors, reflecting back the light that falls on the fish; they are particularly numerous in a deeper layer of the skin known as the argenteum, and it is this, reflecting back practically all the light-rays, that gives the white effect.

It should hardly be necessary for me to mention the elementary fact that there is really no white light. White is simply the combined effect of a number of rays of light of different wavelengths that represent the visible colours of the spectrum. Philosophically, it can be claimed that white light does exist because we see it and use it, but scientifically it has no existence independently of the colours; it is one of those things that 'at the same time is and is not'.

Colour and Light-Rays

Pigments absorb or interfere with these coloured rays; one that absorbs them all, sending none back to our eye, appears to be black; one that absorbs those at the blue end of the spectrum will appear red or orange. A pigment that selects the red rays and sends back the blue or green is very rare and for practical purposes we can discount it.

The blue colour so often seen in fishes is due to a combination of black pigment and iridocytes; the latter are not necessarily confined to the argenteum, but may

be scattered among the pigment cells in the outer layers of skin; they are of different types and some of them may behave like crystals in splitting light into its component colours.

Green, similarly, is usually produced by a mixture of black and yellow pigments with iridocytes.

But the colours produced in this way appear flat, not gleaming like the stripe of a neon fish or glowlight tetra. So long as the light striking upon the argentum is uninterrupted, the effect to the eye will be dead white; but overlying iridocytes and pigment cells can change it. The iridescent and opalescent gleams of colour often seen on the otherwise white parts of a fish are due to iridocytes in the overlying layers. But if, lying above the argentum, there is a layer of pigment cells that absorb or otherwise interfere with light-rays of a particular wavelength, then the colours that are left will be reflected back brilliantly. The combined effect of pigment and iridocytes is to gather certain light-rays and reflect them back in concentration.

Suppose that your neon fish dies. You will find that the characteristic strip of blue light will fade and disappear almost immediately. Put the fish in a preservative such as formalin and the red patch may survive for a while but the 'neon' strip will show only as a dark-grey band—a band of pigment. This is the pigment that interferes with the light when living, allowing only the rays of the blue-green end of the spectrum to strike upon the argentum and be reflected back. Post-mortem changes in the cells prevent this in the dead specimen.

Take now a dead glowlight tetra. Here we will find that the stripe, though no longer gleaming like an illumination, nevertheless retains a pleasing cherry-red colour; it is evidently a different kind of pigment from

that found in the neon fish. In fact it returns red rays either directly, as in the dead fish, or more intensely by reflection from the argentum in the living fish.

The stripe in all these fishes, and others of the family, corresponds not with the lateral line as might be supposed but with the junction between the muscles of the upper and lower parts of the body. These lateral muscles lie along the body in two great chains on each side divided only by a thin septum which is supported on the vertebral column. They operate together or to some extent independently according to the needs of locomotion and there is considerable movement along the region of the septum. It is here that the pigment band is deposited.

Elsewhere and in a different context I have several times pointed out that concentrations of pigment are basically related to areas of movement. The colour-pattern of a fish is not something painted on as an afterthought or to camouflage it (though it may serve that purpose), but is related to the dynamics of the body.

The head-and-tail lights of the beacon fish are easily understood if one thinks of the muscular activity associated with the mobile eye and the caudal fin; for an extension of the effect between them there is the line of the lateralis septum. How it comes about is a matter of conjecture. The 'illumination' seems to be a device for selecting certain light-rays and rejecting others. Possibly the glowlight tetra requires ultraviolet rays and the neon fish does not. Functionally, the stripe may serve as a marker, keeping the shoal together.

The precise physics, mechanics and functions of iridescence are extremely difficult to study in the living fish; most of what we know is from the examination of dead material in which the post-mortem condition leaves us very uncertain about the right answer.



by ARPEE

LAST year my dealer introduced me to Arnold's sucking catfish (*Otocinclus arnoldi*), and I have come to regard this as one of his Better Ideas. In fact, I shall probably buy him a pint of old and mild for it one day because this fish has really come to stay in my collection. It is a dapper two inches of brown on creamy white with a horizontal lengthwise dark bar. Its sucker mouth is generally occupied in scraping algae off any selected surface, but it frequently hangs downward from the glass like some gigantic newly hatched fry. At rest in the horizontal position it props itself up on its outstretched pelvic fins, but gracefully and peacefully disporting itself around the tank in search of food it leaves one with an agreeable impression of a pink head with a streamlined body, followed by a splendid speckled black and white tail.

I haven't had the best of good luck with the specimens I bought, however. Following the advice of more than one authority I quarantined them all rigorously. In went the methylene blue and the boiled lettuce as food and out came the dead bodies a couple of days later. On one occasion I got some thread algae from the pond as food, but the poor fellow became strangled in it. Ultimately, with a certain amount of luck, I equipped my 36 in. show tank with four Ottos, and as a result the algae scraper has almost become a thing of the past. This is one fish I should hate to be without, and my wife spends quite a lot of her time in checking that they are all present and correct. I would suggest two per 24 in. tank (excepting in the company of anything really big and pugnacious); I am told that they are utterly trustworthy even in tanks of fry, and I shall try this out soon in a foolhardy moment, though I must admit to an almost childlike faith in their docility. We shall see.

If one has to seek to criticise *Otocinclus*, the only thing I can think of is that they seem to have a knack of disappearing from view for long periods. You can usually find them concealed, in a hanging position, behind a leaf of *Vallisneria* or the like. All the better when they decide to go for a swim, for they then form a

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A course
for the
would-be
breeder of
tropicals

Part 4 Requirements of Egglayer Fry in their Early Stages

By D. B. McINERNY
(McLynn's Aquarium)

IN my last month's article I mentioned that it was essential to make preparations to produce microscopic and minute foods before breeding the majority of egg-laying fishes.

The first essential will be Infusoria, and this will be required in great quantities. Since most of the organisms are carried about in the air, it is only necessary to provide some slightly warmish water containing vegetable matter in which the Infusoria find a good medium for breeding and they will enter and multiply rapidly.

For those with fish houses who intend to breed quantities of fishes regularly, it will pay to set aside two 24 in. by 12 in. by 12 in. tanks containing clean rainwater, and maintain a temperature of 80°F (27°C), then to purchase some *Aspallaria caprina* (apple snails) for the tanks and feed these on lettuce leaves. For a really good supply of Infusoria each of these tanks will hold fifty or more snails, but as they are not cheap it may be necessary to purchase a dozen or so and breed them to increase your stocks.

The snails gorge on the lettuce leaves, and their droppings provide the ideal vegetable matter to feed and reproduce Infusoria. Kept at 80°F (27°C) the Infusoria breed fast, and jam jars full of this infested water can be poured into the breeding tank, once the fry are free-swimming.

Immediately water is taken from the snail tank it is topped up with fresh rainwater of the same temperature. If each tank is used every other day the Infusoria content does not become depleted. Since the snails in each tank will consume a lettuce leaf a day, the cost will be approximately 10 shillings a week for each tank during the winter months, but less during the summer when lettuce is cheaper. For the regular breeder this is as cheap and as little trouble as anything, but for the aquarist who wants only an occasional spawning the constant upkeep of a permanent supply of Infusoria is an unnecessary waste and expense.

For him it would be best to have a 24 in. by 12 in. by 12 in. tank filled with clean rainwater and maintained at 80°F (27°C), and to throw into it bruised lettuce leaves, banana skins and potato peelings, and then infect the water with a jarful of water taken from an existing aquarium, clean pond or even a vase full of flowers that are about ready to be thrown out. Keep the supply

of vegetable food going for as long as the Infusoria are required.

When pouring jam jars full of the Infusoria into the breeding tank a cloud of greyish moving organisms should be clearly seen on close examination. If not, the Infusoria is not thick enough. For the average spawner in a 24 in. by 8 in. by 8 in. tank at least two 2 lb jam jars full of thick Infusoria will be required daily.

If well fed, the fry should grow sufficiently for newly hatched brine shrimp to be introduced into their diet from the fifth to the fourteenth day according to the species and size of the fry. Gradually introduce the brine shrimp, keeping up the Infusoria at the same time. Once all the fry are eating brine shrimp (observable by their pink tummies), the Infusoria can be cut down.

The Use of Brine Shrimps

Brine shrimp is expensive and professional breeders use no more than is essential. The brine shrimp eggs can be purchased from most shops. (I prefer the Californian variety in preference to the Great Salt Lake ones, because the percentage hatching seems much greater.) To hatch brine shrimp use small tanks or battery jars, and place in these 1 quart of fresh tap water, add two heaped dessertspoonfuls of common salt, maintain a temperature of 80°F (27°C), supply aeration and sprinkle one level teaspoonful of the dried eggs on the surface of the water. The shrimps will hatch in 24-30 hours and may be siphoned off through a fine, though quite small, nylon net placed over a large jar. The newly hatched shrimps can then be scraped off the net with a penknife and fed to the fry. The water strained through can be returned to the original container and used again.

After two hatchings a great number of empty egg shells will be left in the hatching container. These can be washed away, and the old water used several more times before it becomes better to make a fresh brine solution. Do not feed with too much brine shrimp, as it is a very salty diet and fry can die through too much salinity.

As soon as brine shrimp is added to the fry's diet, start preparing several shallow pots for a succession of micro worms. These can be china or bakelite, preferably

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Training for

By THOMAS BEHNE



Herr Hans Schmidt gives his skilled attention to some specially delicate marine fishes before despatch

Below: Beginners with Tropicarium Frankfurt have the job of tank-cleaning and topping up



Right: Special customers like Dr Backhaus, curator of Frankfurt Zoo, are permitted to 'help themselves'

I HAD just passed my last examination in secondary school, I was 16 years old and I had to decide what my future profession would be. I always had a great affection for animals, and for fishes in particular, so I went to Frankfurt Zoo and asked the managing director what I could do with my school education and my love for fishes. He advised me to go to Buchschlag to see Mr Hans Schmidt, the owner of Tropicarium Frankfurt. This I did, and gained my introduction to this wonderland for hobbyists.

I took my time and walked all about the premises, watching the thousands of tropical fishes. After some time Mr Schmidt asked me into his office to tell me about the possibilities of a career in the aquatic trade.

First I asked him if there was an acknowledged career in the aquatic trade at all. He told me that there are various possibilities for young people in this trade. The profession from which the ones in the aquatic trade derived is that of animal technician in zoological gardens and scientific institutes. Their training provides a widespread education about animals from louse to leopard and leopard danio, in special schools for scientific work, the apprenticeship lasting for 3 years, ending with a State examination supervised by the chairman of the Institute and members of the Chamber of Commerce.

Mr Schmidt added that the aquatic trade, however, did not have the time and chance to give young people this wide biological education. He stated: 'We have to make it more practical. It is no value to have our apprentices doing research work on mice for weeks. We train



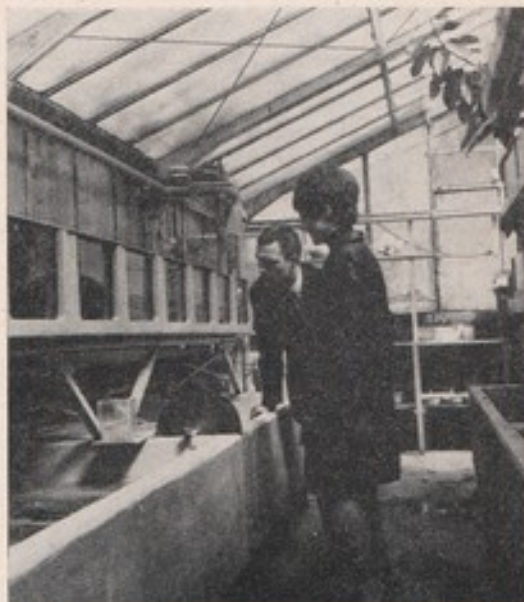
the Aquatic Trade in Germany

our people to become wholesale merchants, retail businessmen, sellers, fish attendants and breeders.' 'Young people', he continued, 'who have just finished 8 or 9 years at elementary school can become salesmen, retailers and fish attendants, whereas a wholesale merchant needs a more profound education at High School.'

This was quite clear to me, but I was eager to know the conditions and more details about the jobs concerned.

'If you want to start here', Mr Schmidt went on with the discussion, 'your parents, the employer and you will have to sign a contract which will be filed in the Chamber of Commerce. Once signed, there is no way out. The apprenticeship, in general, runs over a period of 3 years. If you want to become a fish attendant, for instance, most of your work would be practical training. The first day you start, our group leader will be with you and teach you all the manipulations and knacks. To start with, you will be trained to clean tanks, to wash and prepare filters. This work might be a bit dull, but, as you know, cleanliness is a most important factor in stocking fishes to avoid heavy losses. The main part of the practical training is the handling of fishes. You will be taught how to catch fishes, how to move them, and how to prepare tanks. Of course, from the first day on, you will have to learn a great deal about the names, origins, families and kinds of fishes. We have our own library where you can study, for example, how fish have to be fed, find out whether they are fighters, which are livebearers, which are coldwater fish, and whether they tend to jump out of tanks. All these little details are most important to guarantee the right care. After a time of general work and theoretical instructions you will have to service your own block, in which you take full responsibility for the fishes, as you are the only one who will feed and treat them.'

Continued overpage



Customers at the Tropicarium select their fishes



Filters are cleaned by trainee Bettina (above) and (left) Miss Hensley, an apprentice from the U.S.A., checks water pH of the living corals aquarium



'Oh, yes', I interrupted, 'what about the treatment you give fishes when they are ill?'

'This is not so difficult as it appears', Mr Schmidt explained. 'In your block you will have sufficient time to keep an eye on your fishes. It is only a matter of experience to recognise a disease before it breaks out seriously. Again the books you will study mention in detail all the diseases the various kinds of fishes can get and the measures you take against white spot, fungus, neon disease and food poisoning, to give only a few. Every apprentice has to keep a record on the work he does. This is a kind of control that your master has on your efficiency. The reports have to be signed by you, your employer and your teacher.'

'My teacher?' I asked. 'I thought I had escaped school forever!'

'As a matter of fact', Mr Schmidt laughed, 'during your apprenticeship you will still attend school, the so-called Vocational School. Twice a week for a few hours you will have to cope again with mathematics, book-keeping, writing, languages and essay writing. You will learn a lot about bank accounts, discounts, cheques, post, bank and international formalities etc. This school cannot give you any practical or theoretical instructions on your speciality, as our trade is too specialised, although many other branches have special instructors in Vocational Schools.'

As I did not like school at all, I quickly switched the subject back to work in the fish house: 'If you see that I am quite experienced in maintaining my block of tanks, what will I do next?'

'If we see that you make good progress you will advance, of course. This means that if your first block was tanks of coldwater fishes, for instance, then we shall next train you to keep tropical freshwater fishes as well. You'll get to know everything about the temperature, the water conditions and other special attention they demand.'

I said how pleased I would be to have a precisely defined job with my block.

The 'Odd Jobs'

'I'll have to disappoint you slightly, I'm afraid', Mr Schmidt replied. 'There are, too, some odd jobs to be done in between your regular daily work. Every few days we have to go down to the ponds to catch live food. Of course, you'll have to know how to pack fishes, plants and corals for consignment and delivery. You'll also have to collect a shipment from the airport etc., but this will only take you a few hours in your 42-hour week.'

I then asked Mr Schmidt if marine fishes are attended only by people with special training.

'Of course, every sphere in this field needs special training, talent and flair. If we know your leaning you'll go through a training for more delicate freshwater fishes, and work in the plant house, with the understanding that you'll receive definite instructions about plants. If I see that you are well talented you will spend a few months attending marine fishes. This training might start at the end of your second year or the beginning of your third, according to your progress.'

'Nevertheless, our specialists and our group leader will each give lessons on their speciality. At every stage of your education you'll find similarities, so that it is not as

much work as it appears. The final section you might deal with is quarantine. New shipments from overseas, treated with drugs for better transport, need special care, a time for acclimatisation, and a knowing hand. This is also required by sick fish. This particular job not only demands a great deal of knowledge, it also wants idealism and, above all, discipline.'

'So', I recapitulated, 'an apprenticeship in this branch includes theoretical training and practical instruction, going through the particular fields and school.'

'Quite right', Mr Schmidt agreed, 'this is the common training the average talented apprentice gets. Individuals can do a lot more additionally to the education the school and I can give. There are scientific books about filter methods, instruments, fish, reports on species, breeding methods, and there are discussion groups or associations which are looking for interested newcomers.'

'At the beginning you said something about wholesale merchants and retail businessmen. What knowledge in addition to all this do they need?' I asked.

Paper Work

'Besides the general training with fishes and plants, which I have already outlined', Mr Schmidt went on, 'these apprentices spend some months in their second year and most of their third year doing paper work in the office. They also have to attend classes at Commercial School. There and in the office they are instructed in detail about international agreements of commerce, bank, post and wholesale formalities. They also have to discuss terms with the dealers overseas and with the airlines. They also learn book-keeping, sales records, how to serve customers and how to discuss terms with retail shops. It is understood that they know typewriting and shorthand. English is the main language they have to master. If they are trustworthy they experience the work of cashiers.'

'What about examinations?' I asked Mr Schmidt.

'Examinations have to be set to obtain some idea about the progress the students have made during the 3 years of apprenticeship. At the end of this period every apprentice has to pass this examination before members of the Chamber of Commerce and the chairmen of the Association of the German Aquatic Trade. There is a written and an oral examination and a test about the speciality of the trade. For wholesalers there is also an examination on all this paper work. The subject of the examination is secret and approved by a State department. The examinees get to know the results a few weeks later. This is, of course, the big event. The certificate is also State-acknowledged and enables the holder to take up any profession in Germany, according to his qualifications.'

'If I were to sign the contract tomorrow and go through the training for 3 years, would I then have to stay in the aquatic trade?', I asked Mr Schmidt.

'As a matter of fact', Mr Schmidt explained to me, 'you would have the opportunity of going to a zoological gardens, and with some more training you could do research work in institutes. As a wholesaler, however, you can go to any other firm or branch. You are then

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Requirements of Egglayer Fry

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round, and 2½-3 inches deep. Buy a culture of micro worms from an aquarists' shop, and from a grocer's or chemist's a packet of Farex baby food. Two level dessertspoons of Farex mixed with a little water to a stiff consistency will be sufficient for three pots. Place this in the centre of the dish and infect with a saltspoonful of living micro worms. Cover each dish with a sheet of glass, and on top of this place a piece of hardboard to exclude light, and store in a warm place with a temperature between 78° and 80°F (25-27°C).

The micro will start to multiply until it is so thick that some of the minute worms crawl away from the mass to find more living space. When they creep up the sides of the dish they can be wiped off with the tip of a finger and washed off in the fry tank. As soon as the first lot of micro is being used prepare a second batch, infecting the new Farex with a saltspoonful of the old culture.

Micro usually takes about 4 days to swarm up the sides of the container, lasts about 4 days in this stage and then begins to age and deteriorate; so as the first lot is going off the second batch must be coming on. The original pots are then washed out and used again, and this routine continues for as long as necessary. After the micro stage the fry should be as big as the normal livebearers, and will be ready to take a good fine dried food.

For the beginner who wishes to breed his first egg-laying species perhaps the easiest, to gain experience, would be the black-line tetra (*Hyphessobrycon scholzei*) or the Buenos Aires tetra (*Bonagrassius caudorotatus*). Either will spawn quite happily in a tank 24 in. by 8 in. by 8 in. containing tap water at 80°F (27°C) and a nylon mop, a loose bunch of coconut fibre or willow root. They will, of course, breed equally well in a similar tank containing sand, two thick bunches of *Myriophyllum* and with several smaller plants dotted about here and there. But this necessitates washing the sand, cleaning the plants free of snails, and planting.

Select only a well-filled female; from the side view she should be quite deep in the belly. Having caught her place her in a jam jar half-filled with water from her tank. If looked down on from above, her flanks should be quite well distended. Now select a slim fish for her male partner. Again viewed from above, he will taper from the gills to the tail and not show any sign of bulging sides. If the water in the breeding tank is slightly warmer, both fishes may be tipped straight in. It is preferable to do this in the late afternoon. Should the nylon mop, coconut fibre or willow root be floating, weight it down with a small piece of stone or slate; cover the tank with a sheet of glass, and leave undisturbed. The pair will have time to settle down and feel secure in their new surroundings before darkness falls.

By next morning it is quite likely that spawning will be taking place, the male chasing the female and pressing her against the material chosen for spawning. As they

quiver side by side, she will eject four or five eggs and he will inject into the water thousands of sperms. Each egg on emerging is slightly oval in shape, but quickly becomes a sphere. Through the tiny invisible opening one sperm is taken in, and development begins. Eggs will be seen not only in the spawning medium, but many on the bottom of the tank.

If there are plenty of eggs, or if the breeders begin to lose interest in each other, remove them quietly but quickly, with as little disturbance as possible. Return them after temperature adjustment to two separate tanks, one for males, the other for females. This allows the females to refill with roe more quickly, and when required for breeding again, one fish from each tank is bound to provide a male and a female.

When a bare tank has been used it is possible to view the eggs from underneath, and if this is done late the same afternoon the developing embryo will be seen in quite a number of clear eggs; others will have turned an opaque white. These are infertile, and will grow fungus, but do not attempt to remove them. More harm than good will be done, and it is very unlikely that they will harm the fertile eggs. By next morning, again looking through the glass base of the tank, dozens of tiny glassy fry, looking like eggs with tails attached, will be seen lying on the bottom glass. Gentle aeration may now be placed in the tank, but do nothing more than this. By the morning of the second day, 48 hours after spawning, many of the fry will be free-swimming. Now give them a full 2 lb jam jar of thick *Infusoria*.

Another easy fish to spawn is *Melanotaenia maculata*. Using a bare 24 in. by 8 in. by 8 in. tank, fill it 5 inches deep with tapwater and add one teaspoonful of ordinary salt. Place in the tank a clump of willow root, and introduce the breeders once the salt has been dissolved. Maintain a temperature of 78°F (25°C) and leave the fishes alone for at least 24 hours. The pair will spawn over a period of days. The glassy eggs can be seen hanging by fine threads from the strands of willow root. Feed the parents about half-a-dozen white worms each every other day. This will be sufficient to prevent them eating too many eggs, but there should be no worms left to die and pollute the water. After, say, 5-7 days the parents should be removed, and when the first fry are seen free-swimming these should be given *Infusoria* as described above.

German Training Scheme

Continued from facing page

primarily a wholesaler and secondarily one of this particular trade.'

What I did not know yet was the pay that I'd receive during the apprenticeship. With a smile on his face Mr Schmidt gave me this information, too:

'For the first year you will receive DM 100, for the second DM 150, and for the third DM 200.'

Now I had all the information I wanted. I thanked Mr Schmidt for giving me so much time and told him that I'd let him know my decision soon. In my mind I had already decided to train to be a wholesaler. You never know!

Environmental Conditions Best Suited to Goldfish

By CAPT. L. C. BETTS, M.B.E.

President, The Goldfish Society of Great Britain

Goldfish and other coldwater fishes show a greater sensitivity to variations in gaseous content of their water than tropical fishes. The author, recently invited to talk to an International Convention on Water Pollution in Yugoslavia, discusses causes of oxygen depletion in this article

NO person can hope to keep goldfish in a pond or aquarium unless he has an elementary appreciation of what is going on chemically in the world of water. People have been known to possess a very successful pond for years without knowing much beyond the H₂O stage but trouble will come later if not sooner. It is not enough to believe in Nature bountiful, for Nature can revolt when the limit is reached and the purpose of this article is to discuss what those limits can be.

In an aquarium there are always two diametrically opposing sets of conditions at work. One set relies absolutely on oxygen for survival and the other has no need for oxygen at all. The former condition is known as 'aerobic' and the latter 'anaerobic'. When an aquarium is bright and clear with the fishes active and healthy, the plants green and growing, this is the aerobic condition and so long as oxygen is freely available, subject to certain limitations, this condition will persist and the anaerobic forces will remain quiescent. As soon as the available oxygen diminishes, the anaerobic forces will start to take over and if unchecked will eventually succeed. The anaerobic forces are mainly bacteria from the sulphur-reducing group and are the purifying bacteria operating in cess-pits.

This effect of the competition between the oxygen-consuming bacteria and the non-oxygen-consuming bacteria is of vital consideration to the fish and plant populations and the balance of power on the side of the aerobic bacteria must be decisive. Both sides have a common food requirement but the end product of conversion is distinguished by the smell. The one smells 'sweet' and watery whilst the other smells foul and like bad eggs.

When plant life dies down (remembering that algae in all their forms are also simple plants) aerobic bacteria transform the nitrogenous compounds of the plant tissues into ammonia. If sufficient oxygen is available the bacteria will reproduce to numbers equal to the work required of them but if there is a deficiency, then the bacteria population will be equal to the amount of oxygen available. Since the anaerobic bacteria do not require oxygen for survival, their population will increase to take over the work not done by the aerobes. Meantime sulphur gases are being released and this, if nothing else, is sufficient to wipe out the aerobes. By

the time this stage is reached, fishes and plants have long since given up the struggle.

This simplified interpretation of what happens in an ordinary aquarium makes nonsense of the popularly held belief that it is possible to maintain a 'balanced aquarium' in the generally accepted sense of the word. An appearance of a balance is only possible when the scales are heavily weighted in favour of a near maximum dissolved oxygen concentration.

By experience we know that tropical fishes are much easier to maintain in this respect than goldfish because they are developmentally protected against the hazards of water low in dissolved oxygen and high in nitrogenous compounds. They live in a life cycle of tropical flood and drought and in some cases can even survive a temporary existence out of water.

Goldfish on the other hand have adapted themselves to a wide range of temperatures but are only partially adapted to wide variations of oxygen concentration. Nevertheless they are partially adapted when compared with other temperate fishes such as the trout, dace, roach etc.

The assessment of toleration depends very much on what exactly is intended to be achieved. Do we want our goldfishes to be in sparkling health, average health or merely at a point just above survival? In sparkling health the colours are bright, the appetite is good and disease almost unknown. In average health the appearance of the fish varies with the season and disease will be encountered from time to time. Just above the survival line, death is only around the corner.

For those with an elementary knowledge of chemistry the following yard-stick can be applied using the oxygen standard. At 68° (20°C) clean water (say straight from the tap) will hold 8 parts of dissolved oxygen per million. Water containing 6 p.p.m. will maintain a goldfish in sparkling health (all other things being equal), 4 p.p.m. will maintain it in average health and 2 p.p.m. is the survival line. It should be noted that these figures operate at 68°F. At higher temperatures the capacity of the water to retain the oxygen diminishes and at lower temperatures the capacity increases. This explains why goldfish are seen gasping at the surface in hot weather.

What are the factors in an aquarium (apart from temperature) which draw on and reduce the oxygen

available to the fish? To start with, the fish themselves. Big, heavy fish have a greater respiratory demand than small, slim fish. So the size of the fish is an important factor. A natural protection of the goldfish against disease is the thick mucous covering which envelops the body. This mucous covering is continuously being sloughed off and replaced, requiring oxidation to render it inert and innocuous.

A large healthy goldfish in good appetite excretes large amounts of waste matter of an ammoniacal nature,

also requiring oxidation. This oxidation process is carried out not only chemically by the oxygen but also by the aerobic bacteria, who also require oxygen for their life processes. To offset this continual drain, the oxygen must be constantly replaced.

Under aquarium conditions, there are three main sources of replenishment, i.e. at the interface of air and water, through the oxygen-producing photosynthesis of the plants and artificially by air pumps. These aspects will be dealt with in a later article.

Two Creepers for the Aquarium

By C. D. ROE

OF the *Rotala* genus of plants (in the family Lythraceae), which occur throughout tropical Africa and Asia and in sub-tropical Asia, there are two known species that are aquatic. Both of these are Asian. Although little known to aquarium-keepers they are deserving of more attention than they have received up to now.

In form they are very variable, there being several distinctly different 'races' within each species. The first species to be discussed here, *Rotala indica*, was previously known as *Pepia indica*, and the second species (*Rotala rotundifolia*) has collected several synonyms through the years (*Ammania rotundifolia*, *A. latifolia*, *A. subopicata*; *Ameletia rotundifolia*, *Ameletia subopicata*).

Rotala indica. Size varies greatly, in different races of the species the leaves ranging from one-eighth inch to one inch in length. Grown out of the water the leaves are rounded, but when submerged they become elongated and lanceolate. In good light and with temperatures not too high the leaves become reddish purple. The plant has a creeping habit which makes it most useful in an aquarium, since so few plants demonstrate this characteristic among aquarium subjects. Flowers, which are deep pink in colour, are produced abundantly on heads growing from the axils of leaves. Distribution: widespread in tropical Asia from Transcaucasia eastward to the Malaysian Islands and northwards through China to Japan.



Left: *Rotala indica*; right: *Rotala rotundifolia*. In each illustration the upper part shows the appearance of the plant growing above water.

Rotala rotundifolia. As with the foregoing, size varies greatly and leaves show the same variation in form according to the mode of growth. Under strong light the foliage often becomes a deep wine shade. It is equally as useful for aquarium decoration as *R. indica*, as it shows much the same creeping habit, and from its distribution (India, China, Formosa, Siam, Laos, Vietnam) it can be judged that it will stand relatively low water tempera-

tures. Pale pink flowers are developed on terminal heads.

Cultivation

For really rapid propagation these plants should be grown out of water, that is treated as bog plants, in summer and submerged in winter. They will survive in almost any conditions, since they are very hardy, but for best results a warm and shaded situation is recommended.

Personal Comment

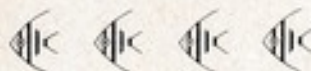
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little shoal and cavort around as though they were really enjoying it all. I certainly hope they are doing just that.



I have spent a small fortune on aquarium plants, and shall spend many another no doubt before an end comes to it all. Which aquarist hasn't? But how many of us have had really consistent success with a wide variety of plants over a long period? The lucky few, perhaps, and I'm certainly not amongst them, though plants fascinate me as much as the fishes, and I am normally quite at home with their terrestrial relatives. I have lost patience with the fine-leaved plants, and spatterdocks, with their rotten rootstocks, have become almost a rude word in this household. Amongst the tougher varieties with which I have experimented I have found a growing respect for *Bacopa*, which I think must be very underestimated and unappreciated.

Its solid fleshy but neat and small leaves stand up well to life in the community tank, and its attractive apple green glossiness is as eye-catching as any plant I know, given the right location. It may be that its slow growth puts some people off, but I recommend perseverance. If the stem grows away and loses its leaves it is as well to prune it back, planting the pruning as new stock. The old base should soon break into growth again and ultimately form a thicket which always reminds me of a Japanese garden, such is its symmetry and charm. There are two good plants of the genus commonly offered for sale—*B. caroliniana* and *B. monnieri*. Distinctly a plant to recommend to my friends, particularly if their water comes from the same sort of tap as mine.



The aquarium hobby, like many more, leaves plenty of room for the glibble, who will buy almost anything that is garish and 'different'. The wide range of divers, treasure chests and lighthouses in ceramics, to say nothing of their rather worse plastic counterparts, is witness to the lengths to which manufacturer and customer alike will go in the cult of tastelessness. Perhaps some reader will write in their defence, since there must be another side to this, though for me the story will have to be a good one!

I look upon the hobby, amongst other things, as some form of outlet for one's creative and artistic leanings, and wherever this operates there must be some evidence of originality and personality. For this reason I would much rather see a simple (even crude) lay-out created from raw materials than an expensive tank stuffed with

excruciating ornaments, equipped with a plastic background and sitting on a wrought iron stand. The owner of the former is so much more likely to take a look around him and improve on his early attempts than the latter, who probably reckons he has the ultimate; he, like the rest of us, soon sickens of the very sight of it, and offers it in part exchange for some other status symbol.



I remember reading somewhere that a prominent transatlantic judge was asked to pronounce on the Worst in the Show by some society or other. Quite rightly he would have no truck with this sort of nonsense, but it looks as though the originator of this grisly idea may have got his own back on decent society after all. He is undoubtedly the breeder of those thousands of wretched specimens of fish which one sees sadly looking at the world from the inside of those ghouliah plastic paperweights currently being sold at the chain stores. I haven't seen a respectable specimen yet; possibly mass-production methods do not allow the job to be done decently, which is a pity. I have nothing against preserving the beauty of creatures after death—indeed, the contemplation of those cases of fish in the pub is a pleasant occupation, but this stems as much from the enjoyment of preserved craftsmanship as of the preserved occupants.

Since the holiday season is now upon us I suggest that aquarists look a little farther afield than their dealers' windows before deciding how their new tank lay-outs will be made up. There will be plenty of opportunities of collecting rocks, driftwood, bark, stones etc. Please, however, collect selectively, avoid any form of vandalism, and make sure that there is no local bye-law or regulation forbidding collection of whatever you are after. A further point to remember is that it is better to collect six small portions of the same sort of rock than to collect six small portions of different types of formation. Above all, reject any rock which is soft or looks soft, as only the harder types, e.g. granite, flint, quartz, have assured themselves of any sort of future in the average tank. When you have brought your bits and pieces home, plan your new arrangements carefully before you put them into practice, but at all events be sure that the china ornaments are scheduled for the jumble sale or the dustbin, even though you have nothing exactly to replace them; a nice restful piece of open space will do just as well.

Fishes of the Genus *Barilius*

IN the article on 'Tropical Fishes of the Genus *Barilius*' (PETFISH MONTHLY, May) the statement 'That is all that fish-hobbyists have heard of the genus until now' which followed some references to these fishes in named books was not meant to indicate that *Barilius christyi* has been mentioned only in the works quoted. *Barilius christyi* is described in *All About Tropical Fish* by Derek McInerney as well as in *Freshwater Fishes of the World* by Günther Sterba, but the statement was intended to draw attention to the paucity of references to the other numerous species of this genus in aquarium literature.



AT the end of May **PORTSMOUTH A.S.** were hosts to Bracknell, Brighton, Bourne-mouth, Didcot, Gosport, Isle of Wight, Mid-Sussex, Reading, Reigate and Redhill, Salisbury and Southampton A.S. at an inter-club table show. The classes were barbs, characins, catfish, rasboras, labyrinths, live-bearers, cichlids, danios-carp-mim-nons, singletail goldfish and twintail goldfish. Each club was limited to 12 entries in the show and a plaque was awarded to the club with the highest number of place marks. Results were: 1, Portsmouth A.S.; 2 (draw), Bracknell A.S. and Reigate and Redhill A.S.; 3, Reading A.S.; 4 (draw), Didcot A.S. and Isle of Wight A.S.

MEETINGS OF STROUD & D. A.S. this season have included several very informative and entertaining lectures. Mr Isaacs, a former chairman and manager of the Nailsworth Fisheries, gave an illustrated talk on trout breeding. Mr F. C. Katritzky of London, the expert on aquatic and indoor plants gave members many useful tips about the growth and propagation of tropical plants. Two slide programmes consisting of coloured slides and a taped commentary on brine shrimps and general aquarium management filmed from Hendon A.S. were shown by Mr B. Hewlett the chairman.

The Club's Home Aquaria competition was won this year by Miss Izard (2, Mr Bainbridge; 3, Mr Armas) and a record of the entries was made for the Society on movie film. *Barbus anostomus* was chosen as the 'club fish' this year; the chosen fish are purchased by members and compared some months later and an award is given for the best of each sex. Details of membership and meeting place can be obtained from the secretary, Mr B. D. Cook, 56 Valley View Road, Stroud, Gloucestershire.

WHEN SOUTHEND, LEIGH & D. A.S. was host to the Basildon and Thurrock Societies in the first leg

of their annual inter-club competition. Thurrock won with 16 points (Southend, 14; Basildon, 11). The judges remarked on the quality and quantity of the fishes entered for the competition and members attaining points for their respective societies were: Messrs Barber, Durrant, Hartlebury, Hemble and Nicholls for Thurrock; Messrs Capon, Cheswright, Dunn, Mason and Ward for Southend; Mr Lupton for Basildon. During the evening Mr C. J. Skilton of Chelmsford gave an illustrated talk on the culture and propagation of decorative aquarium plants.

THE June meeting of the **NEW-PORT A.S.** saw members 'out and about' on a car rally, the ultimate destination being a pond containing daphnia! All present had a most enjoyable evening and many thanks were extended to the former chairman of the Society, Mr Colin Salmon, and Mrs Anne Salmon, secretary of the club, for formulating the route. After a keenly fought contest winners were the car party of Mr Leo Bannerman, with Mr Ivor Phillips' entourage being placed second. The same evening saw the first of the half-yearly knock-out

competitions for 1966 for a plaque presented by show secretary, Mr Michael Parry. The winner was Mr Eric Harris (Siamese fighting fish) with Miss Kay Bannerman second (veiltail guppy).

AT a recent meeting of **STEVENAGE A.S.** the talk on judging fish and aquaria by Mr J. V. Morrice gave rise to an interesting discussion on the value of some method of standardising judging for the length and size of fish. The lecturer had explained the difficulties of judging this entity but it was generally agreed that competitors would value uniformity amongst judges on this aspect. It was suggested that all judges might meet and draw up a table of reference for the size any given fish should reach in a particular sized aquarium, along the lines of the table of 'difficulty of breeding' that was used until recently by F.B.A.S. judges. Mr Morrice agreed that the idea was good but suggested it was impracticable. A conference of judges would be difficult to achieve and the discussion leading to any sort of agreement on size of fish would undoubtedly be extremely lengthy. To prepare a table for even

F.B.A.S. Championship Classes

THE FEDERATION OF BRITISH AQUATIC SOCIETIES held their general meeting on 4th June at The Conway Hall, Red Lion Square, Holborn, London, W.C.1, when delegates from the following clubs were present: Chelsea, Mr E. L. Arthur; Basildon, Mr K. Bronze; Thurrock, Mr E. Nicoll; Bethnal Green, Mr C. R. Snaith; Hastings & Bexhill, Mr Sleet; Weymouth, Mr Forest; Reading, Mr D. Hancock; Portsmouth, Mr J. Stillwell; Southampton, Mr W. Ryder; Brighton & Southern, Mr R. Browning; Willesden, Mr Glass; Independent, Mr Tomkins; Fancy Guppy Association (Radlett), Mr F. Stone; Newport, Mon., Mr G. Jennings; Hampstead, Mr K. J. Pye; Stevenage, Mr G. Denny; Chingford, Mr G. A. Gibbs; Walthamstow, Mr Collins; London Transport, Mr J. Stewart. Personalities among the non-delegates included Mr Katritzky, the lecturer on aquatic plants.

In the chair, Mr A. G. E. Jessopp.

Discussion arose on the question of the revision of the Coldwater Standards and Guides, and it was suggested that this discussion should be taken up further at the F.B.A.S. judges and lecturers conference which is to be held on Sunday, 25th September at which representatives from affiliated societies will also be welcomed.

The motion put forward by Mr F. Stone that 'any affiliated society running an open show will, when applying for a trophy, nominate the championship class which is to be sponsored by the F.B.A.S. and the council will approve or ask for an alternative class to be selected in order that classes will not be duplicated in the same area' was carried unanimously. The table show for angels and Siamese fighters was judged by Mr Stillwell. The next general meeting will be on 3rd September.

the 400-500 fishes most likely to be seen on the show bench would be a mammoth task and take up a great deal of the judges' time—time that was already in heavy demand for actually judging shows. The lecturer pointed out that, as in his own case, show judging meant that a judge had little time at home and the extra commitment suggested would prove an impossible burden. It would be difficult to remember the table, and if it were necessary to look up each fish before getting on with the judging it would mean that more judges would be needed at a big show with more cost to the club concerned.

At the table show of a.v. live-bearers and danios that Mr Morrice judged at this meeting, the first prize was taken by an exceptionally fine mosquito fish, a very large, clean specimen over 10 points better than its nearest rival.

AT the annual general meeting of the **DUNDEE A.S.** the following office-bearers were appointed: president, Mr James McGeoghie; vice-president, Mr F. McNaughton; secretary and treasurer, Mr G. B. Kirkland (2 Kerrington Crescent, Barnhill); show manager, Mr A. Cross; committee members: Miss E. Davidson, Mr A. L. Hastie, Mr R. Brown, Mr B. Robertson and Mr J. R. Baxter; auditor, Mr S. Mackenzie; canteen manageress, Miss E. Davidson. Trophy winners were: Monifeth trophy (furnished home aquaria), Mr P. N. Greening; Balguy trophy (Breeders livebearers), Mr Albert L. Hastie; Balgillo trophy (Breeders egg-layers), Mr Fergus McNaughton; Bruce Cup (guppies), Mr W. S. Russell; Kamarhatty Cup (characins), Mr A. Inach; Amalfi cup (catfish), Mr F. McNaughton; Baldoan trophy (barbs), Mr S. Mackenzie; Pat Strachan trophy (large cichlids), Mr A. L. Hastie. The supreme championship, the Scott trophy, which is competed for throughout the year, was won by Miss E. Davidson as was also the Tayside trophy for member of the year (210 points). This award is open to all members with the exception of the office-bearers and committee, and points are given for attendance, entries in table shows run by the Society, for the introduction of new members to the club and for suggestions and ideas put for-

ward for the improvement and running of the Society. During the season plans have been made for slide and tape shows on aquarium plants and killifish, talks on the manufacture of carrying boxes, fish photography and the chemistry of water, a judging competition and a trip to the aquarium at the Edinburgh Zoo.

AT the annual general meeting of the **SOUTH LONDON** section of the **FANCY GUPPY ASSOCIATION** at the Lady Gorm House, Hawkestone Road, Rotherhithe, London, S.E.16 most of the 54 members attended, together with a few visitors and good support was given to the show bench. The new committee for the following year is: chairman, Mr B. Simpson; vice-chairman, Mr A. Jamieson; secretary, Mr A. Goodall (44 Redriff Estate, London, S.E.16); treasurer, Mr A. Tatman; show secretary, Mr R. George; assistant show secretary, Mrs J. George; P.R.O., Mr B. Montilla; A.S.L.A.S. representative Mr G. Bass. Class winners on the show bench were: multi-veil males, Mr B. Collyer; fantail males, Mr Goodtail and Mr Montilla; delta males, Mr Goodall and Mr Montilla; a.v. sword males, Mr A. Tatman; flagtails and scarftails, Mr B. Simpson; a.o.v. males, Mr T. Price; colour males, Mr Goodall and Mr Montilla; superba female, Mr G. Bass; wedgetail female, Mr D. Curry; scalloptail female, Mr R. Biggs; original female, Mr A. Jamieson; a.o.v. female, Mr G. Bass; four matched males, Mr Goodall and Mr Montilla (gold star); two matched males, Mr Goodall and Mr Montilla (gold star). Medallion for the best entry on the show bench: Mr Goodall and Mr Montilla. Two silver badges were awarded to Mr B. Collyer and Mr G. Bass.

Any guppy lover will find a warm welcome and good competition on the show bench. Meetings are held on the last Sunday of the month and intending new members should contact the secretary at BER 4656.

BLACKPOOL & FYLDE A.S. members enjoyed two very entertaining meetings in June. The first took the form of an auction, with Mr F. Willmin acting as auctioneer; the money raised was handed over to

club funds. Table show results for this meeting were: Singleton trophy: 1, Mr J. Smith (dwarf gourami); 2, Mr J. Hayes (three-spot gourami); 3, Mr B. R. Simmons (three-spot gourami). Robinson trophy: 1, Mr J. Smith (dwarf gourami); 2, Mr B. R. Simmons (three-spot gourami); 3, Mr J. Hayes (three-spot gourami). At the second June meeting a Fish Drive was the main attraction. This game was played in the same way as a Beetle Drive and some very strange fish were drawn. The results for the table show for breeders class were: 1, Mr J. Smith (*Aph. breittanum*); 2, Mr J. Hayes (*platy variatus*); 3, Mr C. H. Jones (*Aptinagrassia ramirezi*).

THE SECRETARY OF **GORTON & OPENSHAW A.S.**, Mr Len McCourt, asks us to publish the following notice: 'The Society has now moved to new and better headquarters at the Railway Hotel, Chapman Street, Gorton, Manchester 18. New members will be made most welcome to join with us in our many forthcoming activities, which include our second annual Open Show (to be held on 14th August at the Conservative Club, Gorton Lane, Gorton, Manchester 18. This year there will be 40 classes, owing to the introduction of pairs classes in all the popular sections, and a marine section (we think we are the first club in the North to introduce this). All classes will have valuable prizes to be won. Societies from the Midlands or further afield will be made most welcome. For further information about this modern expanding society please contact Mr Len McCourt, 36 Railway Street, Gorton, Manchester 18.'

AT the annual general meeting of the **HIGH WYCOMBE & D. A.S.** all officers for the past year were re-elected, with the exception of the secretary, who had retired earlier in the year; the temporary-acting secretary was elected to the office. Officers for the coming year are therefore: chairman, Mr R. Bayntun; vice-chairman and treasurer, Mr A. F. Wilkinson; librarian, Mr C. Chatfield; secretary and show secretary, Mrs V. Pike (16 Ashley Drive, Tylers Green, Penn, Bucks.); equipment officer, Mr C. Beavis; committee members, all the above plus Mrs P. Bayntun, Mr C. Pike and Mr F. Watts. The chairman

Right: Gigantic aquarium replicas designed by Worcester A.S. members for a carnival float (see report on this page)



Left: Eye-level slotted-angle staging used by Didcot & D.A.S. at their open show

reported a quiet year but stressed that some very good social evenings had been held with other clubs and a resolution was passed to invite any other clubs interested to participate in a table show and social evening. Meetings are held on the second and fourth Wednesdays in each month at the Saracens Head, Green Street, High Wycombe.

THE poor response from other societies towards the twelfth annual open show of the Three Counties Group of Aquarists Societies in June greatly disappointed members of the **DIDCOT & D. A.S.** who staged the show. The public showed a great deal of interest and turned up in good numbers to view the show, however, and the best fish in show, Mr V. P. Voysey's sun fish, was a really good entry. Other results were: livebearer breeder: Mr P. Merritt (Reading, golden leopards, 83 pts). Egg-laying breeders: Mr R. Keeping (Basingstoke, tiger barbs, 86 pts). Furnished aquaria: Mr A. Wilkinson (Didcot, 55 pts). A.O.V. labyrinth: Master L. Dunsden (Didcot, leeri gourami, 79 pts). Fighters: Mr F. Hall (Didcot, red fighter, 83 pts). Male guppies: Mr F. Hall (Didcot, black veiltail guppy, 82 pts). Female guppies: Mr F. Hall (Didcot, 81 pts). Barbs: Mr R. Mathews (Didcot, tiger barbs, 88 pts). Danios, rasboras and minnows: Mr A. Wilkinson (Didcot, harlequin, 91 pts). Cats and loaches:

Mr P. Merritt (Reading, *Synodontis*, 85 pts). A.O.V.: Mr T. M. W. Errey (Basingstoke, red-tailed black shark, 90 pts). Goldfish: Mrs W. Voysey (80 pts). Shubunkins: Mrs W. Voysey (81 pts). Fancy cold-water: Mr Forest-Jones (Basingstoke, veiltail, 75 pts). Pond and river: Mr V. P. Voysey (sun fish, 84 pts). Livebearers: Mr G. Youddon (Didcot, midnight mollie, 82 pts). Egg-laying tooth carps: Mr N. Tucker (Didcot, *Aplochanna lineata*, 76 pts). Cichlids: Mr A. Wilkinson (Didcot, Jack Dempsey, 82 pts). Characins: Mr F. Hall (Didcot, headstander, 92 pts).

The judges were Mr J. V. Morrice, Mr D. Mason and Mr B. Baker.

Awards for winning entries in the Three Counties section of the F.G.B.S. were: Cofertails: Mr A. F. Wilkinson (High Wycombe, 75 pts, silver pin). Other short-tails: Mr A. F. Wilkinson (66 pts). Sword-tails: Mr N. Court (Bristol, 72 pts). Coloured veiltails: Mr A. F. Wilkinson (77 pts, silver pin). Fan/triangle/scarf-tails: Mr N. Court (70 pts). Grey females: Mr N. Court (78) pts, silver pin). Coloured females: Mrs D. Court (77 pts, silver pin). Wedgetail females: Mr N. Court (71 pts). Breeders class: Mr N. Court (67 pts).

WORCESTER A.S. recently participated in a rather unusual activity when members built a float representing an aquarium to join the

carnival procession through the streets of Worcester in aid of local charities. The float was made from cardboard painted green. Cardboard was also used to shape leaves of various aquarium plants such as swords. A most excellent way of making the fish was devised by Mr H. Coley; the fish shapes were cut from stiff paper, painted and then backed with greaseproof paper. This was sealed and the shapes blown up to give a three-dimensional effect. Rocks were made from plaster-covered wire netting and painted dark grey. One ton of 1 in. gravel was used to cover the bed of the lorry and the plants were 'planted' in it. (One member was heard to comment that it was the first time he had planted an aquarium in hobnail boots by using a shovel!). The fish were suspended by nylon fishing line. A large reproduction of the society badge was used to cover the back of the lorry (loaned by a local greengrocer, Mr Taylor of London Road) and a pick-up truck covered with paper painted with fishes and plants followed the main float carrying several club members to collect the donations thrown by the crowds. The whole venture meant a great deal of hard work for club members but it proved most enjoyable and after the procession there were a great many more people in the town who knew there was a flourishing aquarist society in their midst.

Sunny Show at Brighton

GLORIOUS sunny weather greeted visitors to **BRIGHTON & SOUTHERN A.S.** third Open Show, held on 11th June at the Ralli Hall, Hove, who were able to combine this visit with a bit of sunbathing on the beach. The Club apologises to competitors for the late finish, however. As in past shows, the benching was not completed until 3.30 p.m. to assist the many visitors travelling from a distance. In the future it is proposed to bring this time forward to avoid such a late finish.

Results for the show were: Brighton Trophy for best fish in show was awarded to Mr R. Whittington (Reigate & Redhill) for his Bristol shubunkin. A.v. platy: 1, Mr G. B. Bass (Reigate & Redhill, red wag platy, 83 pts); 2, Mr J. Smith (Brighton, red platy, 77 pts); 3, Mr T. W. Leach (Reigate & Redhill, platy variata, 76 pts); 4, Mrs J. Stillwell (Portsmouth, platy variata, 75 pts). A.v. swordtail: 1, Mr G. Greenhalf (Kingston, black sword, 87 pts); 2, Mr G. Greenhalf (Kingston, black sword, 80 pts); 3, Mr M. Hurley (Brighton, red-eyed red sword, 74 pts); 4, Mr G. Aylard (Kingston, swordtail, 73 pts). A.v. mollie: 1, Mr G. Aylard (Kingston, black mollie, 80 pts); 2, Mr A. G. Hart (Clapham, green mollie, 79 pts); 3, Mr J. Stewart (London Transport, black mollie, 76 pts); 4, Mr T. D. Smith (Willesden, velifera mollie, 75 pts). A.v. male guppy: 1, Mr T. D. Smith (Willesden, 78 pts); 2, Mr J. Pelham (Brighton, 77 pts); 3, Mr G. Aylard (Kingston, 75 pts); 4, Mr C. Swinburne (74 pts). A.v. female guppy: 1, Mr G. B. Bass (Reigate & Redhill, 74 pts); 2, Mr G. Aylard (Kingston, 70 pts); 3, Mr R. Biggs (Kingston, 69 pts); 4, Mr C. Ward (Brighton, 68 pts). A.o.v. livebearer: 1, Mr R. Cooper (Kingston, *Gambusia affinis*, 84 pts); 2, Mr R. Cooper (Kingston, *Limia vittata*, 81 pts); 3, Mr J. E. Howe (Mitcham, mosquito, 79 pts); 4, Mr R. Cooper (Kingston, merry widow, 78 pts). A.v. characin: 1, Mr R. Biggs (Kingston, *Nannostomus harrisoni*, 82 pts); 2, Mrs J. H. Partridge (Crawley, *Nannostomus anomala*, 80 pts); 3, Mr J. Pelham (Brighton, glowlight, 79 pts); 4, Mr J. Smith (Brighton, pencil fish,

78 pts). A.v. barb: 1, Mr J. Pelham (Brighton, nigger barb, 80 pts); 2, Mr N. Short (Mid-Sussex, rosy barb, 79 pts); 3, Mr J. Bishop (Mid-Sussex, rosy barb, 78 pts); 4, Mr A. G. Hart (Clapham, cherry barb, 77 pts). Danios, carps, minnows: 1, Mr C. Swinburne (white cloud, 80 pts); 2, Mr C. Weller (Mid-Sussex, *Labeo nuchii*, 79 pts); 3, Mr P. Saunders (Clapham, giant danio, 78 pts); 4, Mr P. Saunders (Clapham, giant danio, 75 pts). Rasboras: 1, Mr R. Biggs (Kingston, *Rasbora jacobsoni*, 84 pts); 2, Mrs E. Coleman (Brighton, redtail scissor, 82 pts); 3, Mr R. Keeping (Basingstoke, scissor tail, 79 pts); 4, Mr G. Greenhalf (Kingston, *Rasbora borzoiensis*, 78 pts). A.v. fighter: 1, Mr J. E. Howe (Mitcham, red, 69 pts); 2, C. Weller (Mid-Sussex, red, 68 pts); 3, Mr J. E. Howe (Mitcham, red, 66 pts). A.o.v. labyrinth: 1, Mr A. W. Zurmuehle (High Wycombe, *Ophrosenna goramy*, 87 pts); 2, Mr G. Aylard (Kingston, *Ophrosenna goramy*, 85 pts); 3, Miss J. Stewart (kissing gourami, 81 pts); 4, Mr H. Armitage (Portsmouth, leeri gourami, 80 pts). A.v. tooth carp: 1, Mr H. Armitage (Portsmouth, *Panchax playfaii*, 80 pts); 2, Mr H. Armitage (Portsmouth, *Aph. vexillifer*, 79 pts); 3, Mr H. Armitage (Portsmouth, Florida flag fish, 78 pts); 4, Mr D. Ellis (Kingston, *Aph. bicirratum*, 77 pts). Dwarf cichlids: 1, Mr G. Fellerman (Clapham, *Nannacara anomala*, 85 pts); 2, Mr J. A. Chapman (Independent A.S., *A. ramirezi*, 83 pts); 3, Mr R. Cooper (Kingston, *A. agassizi*, 81 pts); 4, Mr C. Ward (Brighton, *P. aribensis*, 79 pts). A.o.v. cichlid: 1, Mr P. Collins (Reigate & Redhill, blue acara, 83 pts); 2, Mr G. Greenhalf (Kingston, blue acara, 80 pts); 3, Mr C. Ward (Brighton, Jack Dempsey, 78 pts); 4, Mr T. D. Smith (Willesden, firemouth, 77 pts). Corydoras catfish: 1, Mr T. P. Goggin (Crawley, *C. palatus*, 78 pts); 2, Mr P. Saunders (Clapham, *C. palatus*, 77 pts); 3, Mr J. Stemp (Reigate & Redhill, *C. ornata*, 75 pts); 4, Mr H. Armitage (Portsmouth, *C. julii*, 74 pts). A.o.v. tropical cat: 1, Mr A. W. Zurmuehle (High Wycombe, *Diaconema urostrata*, 78 pts); 2, Mr D. W. Ellis

(Kingston, *Plecostomus*, 77 pts); 3, Mr B. Shelton (Brighton, upside-down catfish, 76 pts); 4, Mr D. W. Ellis (Kingston, *Hoplosternum thoracatum*, 75 pts). A.o.v. tropical egg-layer: 1, Mr J. E. Howe (Mitcham, weather loach, 79 pts); 2, Mr J. Ray (Brighton, red-finned shark, 78 pts); 3, Mr M. Hurley (Brighton, *Labeo bicolor*, 77 pts); 4, Mr R. Browning (Brighton, blue Australian rainbow, 76 pts). Tropical breeders livebearers: 1, Mr G. Fellerman (Clapham, half-beaks, 79 pts); 2, Mr R. Cooper (Kingston, merry widows, 77 pts); 3, Mr N. Short (Mid-Sussex, red swordtails, 75 pts); 4, Mr R. E. Partridge (Crawley, guppies, 74 pts). Tropical breeders egg-layers: 1, Mrs J. H. Partridge (Crawley, *N. anomala*, 77 pts); 2, Mrs J. H. Partridge (Crawley, penguin tetras, 76 pts); 3, Mr B. Jackson (Crawley, *Copina gattata*, 75 pts); 4, Mr A. G. Hart (Clapham, corydoras cats, 73 pts). Common goldfish: 1, Mr R. Whittington (Reigate & Redhill, 79 pts); 2, Mr W. Leach (Reigate & Redhill, 77 pts); 3, Mr L. Wateau (Mid-Sussex, 75 pts); 4, Mr T. W. Leach (Reigate & Redhill, 72 pts). A.v. shubunkin: 1, Mr R. Whittington (Reigate & Redhill, Bristol, 90 pts); 2, Mr R. Whittington (Reigate & Redhill, Bristol, 85 pts); 3, Miss D. Morris (Reigate & Redhill, Bristol 81 pts); 4, Mr W. Leach (Reigate & Redhill, shubunkin, 79 pts). A.o.v. fancy goldfish: 1, Mrs J. Stillwell (Portsmouth, fantail, 81 pts); 2, Miss D. Morris (Reigate & Redhill, fantail moor, 80 pts); 3, Miss D. Morris (Reigate & Redhill, twintail veiltail, 78 pts); 4, Mr T. P. Goggin (Crawley, oranda, 77 pts). A.v. river & pond: 1, Mrs J. Stillwell (Portsmouth, pumpkin-seed bass, 81 pts); 2, Mr A. Dixon (Wimbledon, gudgeon, 79 pts); 3, Mr V. B. Hunt (Portsmouth, European dogfish, 78 pts); 4, Mr D. W. Ellis (Kingston, golden rudd, 77 pts).

STONE A.S. was formed in February 1964 as a result of four keen local fishkeepers spending each Friday evening discussing their hobby. The response to their decision to find out whether there was sufficient interest in aquatics and tropical fishkeeping to enlarge the group enabled the Society to be formed. A successful first Open Table Show last year gives hopes of a repeated

success this year when the second one is held on the 16th October. In the meantime, members enjoy meetings such as the colour slide show held recently on common and uncommon tropical plants. A joint running commentary was provided by Mr G. Leadley and Mr C. Barlow, who gave the benefit of their personal experiences with the thirty species of plants shown to a very appreciative audience.

NEWS of an interesting job with fish comes from **CLAPHAM A.S.** A member of the club is starting a fish farm in Ghana early in 1967 and wants an assistant to run it. Passage would be paid and anyone interested should write to the Clapham secretary: Mr J. Rankin, 79 Tooting Bec Road, London, S.W.17.

JUDGES Mr Robert Mealand, Mr Cyril Brown and Mr R. Esson remarked that they could not recall a similar show for many years where so many F.B.A.S. Gold Stars were awarded. They were referring to the very successful **CATFORD A.S.** annual open show held in June at the Catford and Lewisham Institute. Competences came from Tipton, Manchester, Birmingham and Nuneaton in the north and Gillingham, Chatham, Gravesend, Sittingbourne and Sevenoaks in the south. Over 400 fishes were benched, the best classes being labyrinths with 33 entries, and toothcarps with 35. Even the coldwater entry was 24 fish. The major trophy, the F.B.A.S. Championship trophy was awarded to Mr T. K. Payne of the B.K.A. from Penkridge, Staffs for his *Cynolebiar whitei* (91 points). The best fish in show was a velifera molly (92 pts) shown by Mr T. Asquith of Catford.

Awards were made as follows: Plaques: 1, Mr R. Giles (red); 2, Mr R. J. Thorne (marginal); 3, Mr Deives (ostracod); 4, Mr J. Temple (various); Guppies: 1, Mr R. Bagg; 2, Mr C. Swinson; 3, Mr A. Jamison; 4, Mr T. D. Smith. Swordtails: 1, Mr J. Cobden; 2, Mr J. Wilson; 3, Mr Greenhalf; 4, Mr W. Wren. Mollys: 1, Mr T. Asquith; 2, Mr J. Cobden; 3, Mr R. J. Thorne; 4, Mr J. Cobden. A.O.V. livebearers: 1 and 2, Mr R. Cooper; 3, Mr G. E. Greenhalf; 4, Mr R. Cooper. Labrynth: 1 and 2, Mr B. M. Barber; 3, Mr R. Stewart; 4, Mr J. Wilson. Characins: 1, Mr R. J. Thorne; 2, Mr A. Harding; 3, Mr R. Bagg; 4, Mr T. Gillman. Dwarf gchids: 1, Mr D. J. Woodward; 2, Mr R. Cooper; 3, Mr N. D. Lucas; 4, Mrs P. Bone. A.O.V. cichlids: 1 and 2, Mr Challenger; 3, Mr D. J. Woodward; 4, Mr R. F. Choe. A.V. barbs: 1 and 2, Mr T. Gillman; 3, Mr S. G.

Mooney; 4, Mr T. Gillman. Danios, rasboras and minnows: 1, Mr R. Bagg; 2, Mr S. G. Mooney; 3, Mr J. Wilson; 4, Mr Ken Owen. Egg-laying toothcarps: 1 and 2, Mr T. K. Payne (B.K.A.); 3, Mr M. Padwood (B.K.A.); 4, Mr W. Wren. Corydoras catfish: 1, Mrs P. Bone; 2, Mr S. Seay; 3, Mr S. G. Mooney; 4, Mr S. Jones. A.O.V. catfish: 1, Mr A. Jamison; 2, Mr R. Giles; 3, Mr J. Cobden; 4, Mr J. Temple. A.O.V. egg-layers: 1, Mr S. G. Mooney; 2, Mrs T. E. Brown; 3, Mrs P. Bone; 4, Mr W. B. Bos. Brooders livebearers: 1, Mr H. Cooper; 2, Mr C. Felleman; 3, Mr S. G. Mooney; 4, Mr Deives. Brooders egg-layers: 1, Mr J. Cobden; 2 and 3, Mr T. K. Payne; 4, Mr Deives. Singletail goldfish: 1, Mr B. M. Barber; 2, Mr A. Jamison; 3, Mr D. W. Ellis; 4, Mr B. M. Barber. A.V. fancy goldfish: 1, 2, 3 and 4, Mr W. B. Bos. A.O.V. coldwater: 1, Mr J. L. Calver; 2, Graham Owen; 3 and 4, Keith Owen. A.V. plant: 1, Mr A. Jamison; 2, Mr J. E. Marshall; 3, Mr A. Jamison; 4, Mr J. E. Marshall.

TROPICAL marine aquaria were the subject of an interesting lecture given by Mr J. Chalmers to **HENDON & D. A.S.** in June. The talk was accompanied by slides and a display of equipment and accessories. The cost of setting up and maintaining these fishes caused quite a discussion. The speaker pointed out that if more fishkeepers tried to keep marines, prices would fall to a more realistic level with the larger demand. In the meantime, it was obvious, pioneers in this new and largely unexplored aspect of the hobby were at a disadvantage in that having to learn by their own mistakes was proving expensive and disheartening.

READING & D. A.S. members had a lively discussion at the June meeting, at which the subject was *Molliesia*, and in particular in connection with that part of the talk relating to identification of the various types of mollies. The importance of positively identifying a type of fish was readily appreciated by the audience. It was explained that good stock lines of fish could easily be ruined by the introduction of a specimen that, while appearing to be a good example of its species, might contain traces of cross-breeding. Some of the listeners had had experience of this and were anxious to know how to avoid it.

THE show given by the **BETHNAL GREEN A.S.** in June was part of the exhibition of the work of the various clubs meeting at the Bethnal Green Mens Institute. The fish were of a very high standard and the furnished tanks (18 in. by 10 in. by 10 in.) reached a good standard although

many of the plants would have been displayed to better advantage in larger tanks. One original exhibit had made use of a plastic compound in place of natural rock. Awards were as follows: Individual furnished aquaria: 1, Mr L. Bromney (80 pts); 2, Mr D. Mills (75 pts); 3, Mr W. Wren (73 pts); 4, Mr M. Parry (72 pts). A.O.V. class: 1, Mr L. Bromney (silver shark, 80 pts); 2, Mr T. Gillman (tiger bar, 87 pts); 3, Mr L. Bromney (lissatus, 86½ pts); 4, Mr W. Wren (bleeding-heart tetra, 86 pts).

JUNE was a busy month for members of **BRADFORD & D. A.S.** The main monthly meeting (held on the first and third Wednesdays in the month at Unity Hall, Rawson Square, Bradford) was addressed by Mr L. Greenall of Tadcaster, who spoke on toothcarps and the vast numbers of fish that came under this order. At the next meeting, club member Mr J. R. Smith spoke on the problems of culturing worms. The number of awards collected by members during the month was high. At the Dewsbury Show, Mr D. Carr won the award for best fish in show with his flying fox. Mr A. Firth took second in barbs, Mrs First second in characins, Mr D. Carr first and second in carps and minnows, Mr C. Holdsworth first and second in catfish and loaches and second in toothcarps, and in the coldwater class Mr L. Booth took first, second and third. At the Thorne show Mr D. Carr took first in carps and minnows. At Swillington on the 19th, Bradford was awarded best fish in show, six firsts, five seconds and two thirds.

BRISTOL TROPICAL FISH CLUB now has a total membership of 90 and the increase in numbers has made it necessary for a new meeting place to be found. All future meetings will be held on the third Tuesday of each month at the Ship Inn, Redcliffe Hill, Bristol 1.

ALTHOUGH the attendance of the second day of the week-end 'International Tropical Fish Exhibition', held in Manchester in June, gave some evidence of the extent of the interest in the event that had been

Continued on page 162

Dates for your Diary

6-13th August. **PORTSMOUTH A.S.** Open Show at Portsmouth Community Centre, Twyford Avenue, Stamshaw, Portsmouth. Open to public 8-13th inclusive. Benching 6th August; judging on 7th; prizegiving and breakdown evening 13th. Further details from show secretary Mr W. T. Ryder, 493 Commercial Road, Portsmouth, Hants.

14th August. **GORTON & OPENSHAW A.S.** Second Annual Open Show at the Conservative Club, Gorton Lane, Manchester 18. Benching 12.00-2.0 p.m. Judging 2.15 p.m. All enquiries to Mr Len McCourt, 36 Railway Street, Gorton, Manchester 18.

21st August. **MIXENDEN TROPICAL FISH SOCIETY** First Open Show at the Mixenden Community Centre, Clough Lane, Mixenden, Halifax. Benching time, 1.00-2.30 p.m. Schedules obtainable from the show secretary Mr B. Winters, 48 Hambleton Drive, Mixenden, Halifax.

21st August. **FANCY GUPPY ASSOCIATION (LIVERPOOL section)** First Annual Open Show. Norris Green Boys Club. Admission free. Schedules from Mr W. Armistage, 12 Orrell Lane, Liverpool 9.

24-27th August. **MIDLAND OPEN AQUATIC SHOW and TRADE EXHIBITION** at Bingley Hall, Broad Street, Birmingham 1. This year 51 open classes are being featured and in addition the British Killifish Show and the Midland Open Guppy Show are all being staged together for a single admission charge of 2s. Details from secretary of the Midland Aquatic Show Committee, Mr J. Edwards, 34 Veronica Close, Selly Oak, Birmingham 29.

27th August. **HOUNSLOW & D. A.S.** Open Show at Chatsworth School, Heath Road, Hounslow, Middlesex. Show schedules from Mr R. Scurry, 36 Argyle Avenue, Hounslow.

3rd September. **HIGH WYCOMBE & D. A.S.** Open Show at the Rye, High Wycombe, Bucks. Schedules from show secretary Mrs V. Pike, 16 Ashley Drive, Tylers Green, Penn, Bucks.

3rd September. **FEDERATION OF BRITISH AQUATIC SOCIETIES** Assembly.

3rd and 4th September. **NOTTINGHAM & D. A.S.** Third National Fish Show at the Drill Hall, Derby Road, Nottingham. Show secretary: Mr W. J. Christian, 40 Moor Lane, Bunny, Notts.

4th September. September Convention of the **FEDERATION OF SCOTTISH AQUARIST SOCIETIES** at The Good Templar Hall, Gray Street, Broughty Ferry, Angus. Host Club: **DUNDEE A.S.**

11th September. **HUDDERSFIELD TROPICAL FISH SOCIETY** Open Show at the Friendly and Trade Societies Club, Northumberland Street, Huddersfield. Further details from Mr L. Kaye, 6 Totties, Holmfirth, Huddersfield.

17th September. **NEWPORT A.S.** Fourth Annual Open Show at the Drill Hall, Stow Hill, Newport. Classes (26) include two for marine fish. Show secretary: Mr M. J. Parry, 45 Western Drive, Gabalfa, Cardiff.

18th September. **GARFORTH & D. A.S.** Open Show at Church Hall, Church Lane, Garforth, Leeds. Benching 1.00-2.30 p.m. Further details from Mr R. A. Clarke, 66 Derwent Avenue, Garforth, Leeds.

23rd and 24th September. **BRISTOL A.S.** Annual Open Show, including marine classes with special trophy. Benching on 22nd September. Full details and programmes from Mr M. S. Bellis, 2 Fairfield Place, Southville, Bristol 3.

24th September. **CAMBRIDGE & D. A.S.** Second Annual Show, Tracy Hall, Cockburn Street, Mill Road, Cambridge. 4.00 to 7.00 p.m. Free, all welcome. Further details from Mr G. P. Rivett, 19 Goding Way, Milton, Cambridge.

25th September. **BLACKPOOL & FYLDE A.S.** Open Show at the Harrowside Solarium, South Promenade, Blackpool. Further details from Mr C. A. Jones, 4 Halts Lane, Poulton Le Fylde, Lancs.

2nd October. **HEYWOOD & D. A.S.** Open Table Show. Details awaited.

15th October. **EAST LONDON AQUARISTS & PONDKEEPERS ASSOCIATION** Annual Show, Ripple Road School, Barking, Essex. Details available from show secretary Mrs P. Harris, 86 Leigh Road, East Ham, London, E.6.

16th October. **STONE A.S.** Second Open Table Show. Further details from show secretary Mr K. J. Harvey, 61 St. Vincent Road, Walton, Stone, Staffs.

20th-22nd October. 39th Annual Open Show of the **SCOTTISH AQUARIUM SOCIETY**, McLellan Galleries, Sauchiehall Street, Glasgow, C.2. Thursday and Friday 2.00-9.00 p.m.; Saturday 10.00 a.m.-9.00 p.m. All details from Mr John Miller, 14 Alloway Avenue, Kilmarnock. Also on the 21st and 22nd the **FANCY GUPPY ASSOCIATION (SCOTTISH Section)** are staging an Open Guppy Show. Entry forms and details from Mr A. Wallace, Canal Road, Johnstone, Renfrewshire.

29th and 30th October. **BRITISH AQUARISTS FESTIVAL** at Belle Vue, Manchester. Enquiries to show secretary: Mr G. W. Cooke, Spring Grove, Field Hill, Batley, Yorks.

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Club News

Continued from page 159

aroused, the endeavours of the promoters were not otherwise supported as they deserved. A very fine display of guppies by the **FANCY GUPPY ASSOCIATION** contained entries from all parts of Britain and many from overseas, but the entries from the British Killifish Association were disappointingly few. In spite of adequate provision of space the Exhibition was poorly supported by the trade, although it is understood that stands had been planned for inclusion by several firms. A large-scale sale of raffle tickets for some valuable prizes had been engaged in for some weeks before the event and the unprecedented success of this scheme must have offset any financial losses that might otherwise have been incurred.

CUPS, shields and individual trophies made a most impressive array recently at the annual dinner of the **ISLE OF WIGHT A.S.**, at which over 40 members, wives and friends were present. The dinner

was held at the Grantham Hotel, Cowes, and Miss Ann Carter, Shanklin Carnival Queen in 1964, presented the prizes, which were won by the following: Society's challenge cup for maximum points over the year; this was won for the third time and for the second successive year by the secretary, Mr E. Davison. He secured 29 points (which with his 25 handicap made up the 54 maximum). He also won the Plant Cup (a new trophy presented by Mr S. Stevens). Guppy Cup, presented by Mr J. Gardner; Mr S. Stevens (for the fifth successive time). Coldwater Fish Cup, presented by Hendon Club; Mr S. Stevens. Hora shield, presented by Mrs Hora and the late Mr B. Hora for the best furnished aquarium; Mr W. Bradley of Newport. Shield for best tropical fish; Mr W. Bradley; runner-up, Mr E. Davison. Tetra Cup: Mr J. Woods. Novice Cup for tropical fish, presented by Mr E. Bottrell; Mr S. Hurt. Ladies' Cup: Miss Jean Nolan of Sandown. Medals for winners of three first prizes during the year: Mr R. Chapman of Lake, Mr L. Davis and Mr E. Davison; similar medal for 1965, Mr. R. Parker.

AT the first meeting of the new **GLOSSOP A.S.**, the following officers were elected: chairman, Mr M. Fidler; vice-chairman, Mr W. E. Foster; secretary, Miss J. Woodcock, 26 Thorpe Street, Old Glossop; treasurer, Mr M. Fletcher; show secretary, Mr E. Fletcher; committee, Mr D. Cook, Mr B. Perry and Mr J. E. Potter. Meetings are held on alternate Thursdays at the Station Hotel, Glossop, and a warm welcome will be extended to new members.

ELECTION of Mr Peter Battista of the Cardiff A.S. to the **SOUTH WALES TROPICAL FISH STUDY GROUP** brings the total membership to eight. Principal officers of the Group are: chairman, Mr Richard Wigg; secretary, Mr R. Dennis Johns (3, Collard Crescent, Witchell Estate, Barry, Glam.). With the exception of Mr Battista all members of the Group are Class 'B' judges on the Federation of British Aquatic Societies' panel.

A CHANGE of Secretary should be noted for **HUDDERSFIELD TROPICAL FISH SOCIETY**. The new secretary is Mr L. Kaye, 6 Totties, Holmfirth, Huddersfield.

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