

# The AQUARIST AND PONDKEEPER

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## Editorial

WE are, we like to think, as much aware of the changes occurring in the world around us as any other man in the street, but somehow feelings of surprise and amazement still arise within us when fresh wonders are reported. It never fails to set us a-wondering, for example, to read reports which show what big guns can sometimes be brought to bear on quite small targets these days. As an instance, let us spare a thought or two for the team of frogmen of the Royal Canadian Navy and the underwater-camera team of the National Research Council, who, along with others of the Canadian Department of Fisheries, are engaged in investigations at Roaring Bull Rock, off Yarmouth, Nova Scotia.

The matter which has promoted this activity and co-operation between the government departments might seem to be one which would not be given a second thought by the Navy, let alone cause it to pitch in with its equipment and man-power. The problem is this: are metal traps for lobsters better at catching these animals than the old-fashioned lobster pots? It must be noted that this is no idle thought of some powerful official who, a moment after thinking of it, mobilised the Navy to settle his curiosity. No—this work is the culmination of four years of studies by the Department of Fisheries and, such must be the excitement of it all, it has attracted willing helpers from all quarters. So that now, from a diving chamber a camera will film the habits of lobsters faced with the choice of a metal trap or the more-familiar pot, whilst around the scene drift naval frogmen observing things more closely. And all unwittingly the lobsters will, by the revelation of their preference, seal the fate of their own future generations, for the Canadian Minister of Fisheries, Mr. J. Angus MacLean, has said that results of the tests may have far-reaching effects on lobster fishing in the Atlantic provinces. It is all very deserving of leading to something, and if it produces more *cotelettes d'homard*, hats off to the frogmen say we.

# Experiences with Unusual Fishes

by V. L. TREW

**M**OST of us, when hearing a certain expression, conjure up a picture in our mind; the one which always brings back vivid memories for me is "queer fish," although I must say most of the ones I have met were on the dry side of the aquarium!

More than 20 years have gone past since I first became associated with the "aquatic" world, and as a young lad leaving school I took the plunge right into the middle of it. Good fortune gave me a job which I had always wanted—something unusual with plenty of interest. I was taken on the staff of one of the best-known aquarists in London and until the second war broke out enjoyed every day of my work.

Of the many interesting hours that were spent I think the major ones were after it had been decided to open a large aquarium on the roof of a well-known West-End store, as it was then that most of the unexpected fishes came into my hands, many of which I never knew existed. My first experience of this was when, on opening a can two butterfly fish jumped out onto the floor. From then onwards this fascination of peering into new arrivals, cautiously but hopefully, took a firm hold.

Sometimes, however, it was not only the fishes which caused a stir but the publicity they got. One of our leading evening papers had half a page allocated to the story of the squids which hatched out in one of the aquaria. The eggs came with a consignment of marine fishes, etc., and looked like a small bunch of black grapes. These were almost discarded until it was found that one tank still needed occupants. I cannot remember now just how many days it took them to hatch but when they did they bore a remarkable likeness to the adults. Their tentacles were plainly seen and even at that early age it was possible to make them eject a tiny amount of sepia by holding a planting stick close to them.

On several occasions I have found similar eggs on our south-east coast. At Ramsgate, in August, a few years ago six were picked up scattered among the sea-weed left by the tide. On opening one the eye could be seen, also a certain amount of movement, so I feel sure that should any of you have access to plenty of good clean sea water and wish to try the experiment for yourselves, it would prove fruitful and certainly interesting. The eggs of the octopus, squid and cuttlefish are, however, very much alike, so it may not be possible to know which species you are hatching, but this is really unimportant; the main object would be to see how far you could get in rearing them.

Another personality in the aquarium was an electric eel. He got to the exalted position of being tested for T.V. at Alexandra Palace. My own encounter with him was not so favourable. During my daily routine of cleaning front glasses I sometimes put my hand and arm into the tank to perform this duty at a greater speed, and by standing on the lower bank of aquaria you were able to look over the surrounds to see if the job had been accomplished satisfactorily. On this occasion I had not noticed which aquarium I was doing until I looked over the top and my eyes caught sight of the large lettering **ELECTRIC EEL**. The speed at which my hand was removed was comparable to that of a jet plane, and I do not mind saying now that the small beads of perspiration on my brow were not entirely due to the effort I was putting into the cleaning!



Photo:

"Clara" the cowfish

V. L. Trew

A leading company of battery makers did a number of experiments on him to find out how the current acted and quite an informative diagram was placed with other information on the aquarium.

One of the more docile inmates was the cow fish; the accompanying photograph gives a good idea of what it looked like, but only by seeing the living specimen could you really appreciate its mannerisms. Description is difficult, but if you can imagine a fish with a box-shaped body you will have a fair picture. The actual colour varied from light yellow to a delicate shade of pink, which was seen to change as the light caught it from different angles. Its movements through the water were purposeful but there was a gentle grace about them; the caudal fin was carried for the most part folded and, occasionally, when at rest, it would swish this almost like the bovine name-sake, but should speed be required the tail would open like a fan. The head was perhaps the most striking feature, with eyes that reminded me of a chicken's; the "horns" were prominent and had a slight roundness at the points, and the mouth was reminiscent of a parrot's beak. At first it was difficult to get it to take food, but once it had settled down the problem was not so much to make it eat but what to give it. "Clara," as I always called it, soon made it plain that only the best was good enough, and would consume two oysters each day and refused any other shellfish.

As you can imagine, it is the unusual which attracts the general public, so every effort was made to fulfil this demand. It had been suggested to one collector that an octopus would be a worthwhile proposition, and that if he could get one to London "alive" he would be paid for his trouble. This episode gave me a lot of work and some amusement.

Late one afternoon the telephone rang, and I was asked to get our largest tank ready to take an octopus which would arrive sometime the next day. Not an unreasonable request you may think, but only the previous day I had worked for some hours setting it up with large carp. Undaunted, however, I set about the task of changing over. The supply of sea water arrived later that evening, and by 10 o'clock next morning all was ready. It was not until the afternoon that "his nibs" arrived. My employer came in with a very red-faced collector, carrying between them one of those large German cans, and Oswald was tipped almost uncer-

(Please turn to page 5)

# Hints on Building a Fish House

by AQUARIUS

IT is not intended in this article to give plans and measurements of actual fish houses as each aquarist may have different conditions and positions in which the house is to be built. Rather will the idea be to give advice on various features which can be incorporated into the building of any fish house.

The type of house may vary greatly; it may be possible to build only a lean-to type, or an existing structure may have to be adapted. Again there may be room only for a certain size of house or cost may be the limiting factor. Every experienced aquarist has a dream fish house in which he envisages all the latest improvements and advantages. I doubt if any owner of a fish house is entirely satisfied with his lay-out and has not some improvement or alteration in his mind which he would like to carry out. Although you may have to make do with the conditions on hand, with a good deal of planning it is possible to make a reasonably well-equipped fish house for all that.

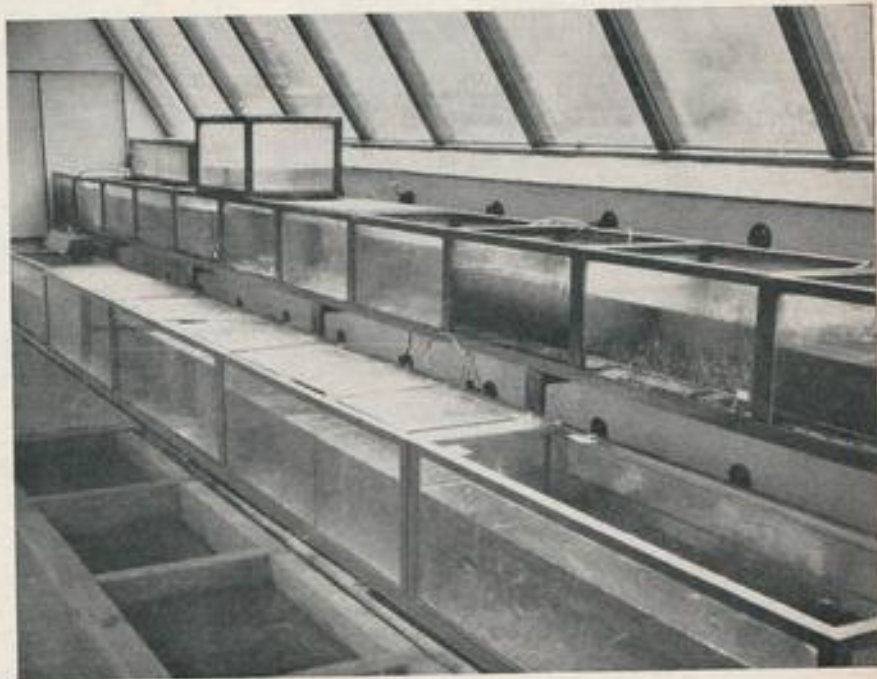
The house you build may have to last you a long time, and so it is important that the plan is well considered before an actual start is made. Try to see other fish houses or pictures of them. Have a chat with one or two club members who have fish houses. You will be surprised how much you can learn from these, as no doubt all have some useful

advice to offer. Don't be a "Jimmy know-all"; almost every aquarist will have some point which may be very useful to you, and there is no disgrace in asking for information!

## Site

Where it is possible to site the house ideally the following points should be borne in mind. Site it as near the dwelling house as possible. This is important as it will be easier to reach it in bad weather, and running water pipes and electricity to it will be easier and cheaper. If there is room for only a lean-to against an existing wall, this may be an advantage, as it saves the cost of one side and the wall will give plenty of shelter and reserve some warmth. The important point to watch when building such a house is to be careful with the junction of the roof of fish house with the wall. The mortar should be removed along the line and a flashing-off lead or zinc inserted and then cemented in. This will stop any water from running down the back of the fish house, as long as the flashing is brought forward far enough to cover the top roof member.

How the house will stand in relation to the sun is another point to watch. The advice given to greenhouse builders is to see that the house runs from north to south. I do not agree with this, as it will be found that in the winter when the sun is low in the sky, the glazing bars of the roof prevent a great deal of the sun from reaching the house during the few hours when sun can be expected. The usual excuse given for siting north to south is that too much sun would enter the house in the summer. Never worry about too much sun! It is always possible to shade out any sun which is not required but I have yet to find an easy way to encourage sun in a badly sited greenhouse in the winter. If a



The tiered arrangement of the aquaria in this fish house is seen behind the lower series of concrete ponds. This is part of a fish house owned by Mr. Dudley Redman of Biggleswade, Bedfordshire

Photo 1

G. W. Shevington

tropical fish house is planned then every bit of extra sun warmth which can be obtained will be very valuable.

### Materials

Material used for the main construction may be decided on the amount of cash available for the project, but do not be misled by this. Often the cheapest in the beginning turns out to be the dearest in the long run. The ideal material is that which requires no annual treatment, either with paint, creosote or other preservatives. Bricks and mortar make a fairly permanent job, needing, perhaps, re-pointing very rarely, but the material to be preferred is asbestos sheeting. This can be of the corrugated type or the flat.

Corrugated asbestos sheeting is by far the stronger, especially as roofing material. It can be cut with a saw (don't use your best one) and drilled for fixing and requires absolutely no further preservative treatment. It will last for years, and instead of getting weaker with age it strengthens. Even old sheeting which has been used for some other structure can be adapted as long as the fixing holes are kept on the top ridges when re-erecting. It is essential when using this material for roofing that the fixing holes are made on the tops of the ridges, or water might seep through the holes. Always use galvanised screws or nails and use a washer with each one.

If timber is preferred then use one of the red types which resist the weather and do not need preservative treatment. To conserve a great amount of warmth an inner lining should be provided. This can be of thinner sheet asbestos or hard-board. A gap of about 1½ in. should be left and this is filled with either fibre-glass wool or some other insulator.

Whether the house is built as a permanent fixture or as a sectional one which can be moved if necessary will depend on several factors. If you are only a tenant then a sectional house will be required, for unless the structure is removable it becomes a part of the house proper and cannot be removed if the residence is vacated. Plans should be submitted to the local council for approval before the building is commenced. A sectional house need not cost much more than an ordinary one. You will need four extra uprights for the walls and some special fitting for the roof so that it can be removed when necessary. The sectional house can have two sides and ends bolted together, when they can soon be dismantled. When fixing the bolts and nuts see that a liberal coating of grease is applied to prevent rust. If this is not done the whole bolt may revolve when the nut is worked on for removal.

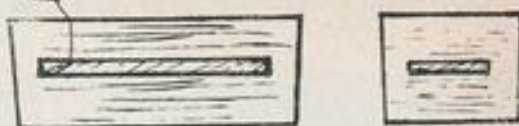
The sectional house must have a very firm level base on which to stand. This can be a concrete footing, or old railway sleepers can be used as long as they are bedded evenly and firmly. If a water pipe is required to the fish house see that this is laid in good time before too much structure is assembled.

### Floor Ponds

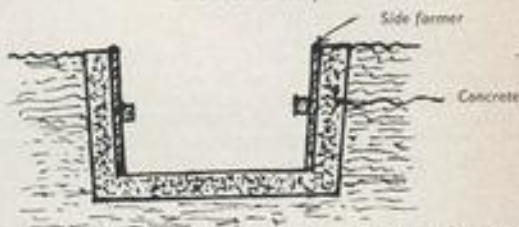
It is a great advantage to make small ponds in the fish house. They can be made down each side, to a depth of about 9 in., along the whole length, but do not make them in one piece. It will be better to make fairly short complete ponds, each not more than 3 ft. long. This makes it easier to construct them and easier to maintain after. Each could hold a different species of fish, and any one could be emptied for cleaning or sorting the fish far more easily. Any ponds made should be completed before the house proper is begun. Allow for the width of the walls and then mark out the sizes of the ponds. See that room is left for a path not less than 2 ft. wide. Three feet is better if it can be managed but in the small house space may be very valuable.

Divide the length of the fish house into equal sections so

Strip for holding. (1 in. x 1 in.)



Shapes of wooden formers for sides (left) and ends (right) of small concrete ponds



Cross-section of a small concrete pond with the wooden formers in position

that the small ponds can be made all the same length. This will make it much easier for construction. The ponds can be made one at a time. First dig out and allow for the thickness of the concrete. For ponds of the size required three-quarters of an inch of concrete thickness will be sufficient. The sides of the ponds can slope slightly. If made in clay or firm ground there may be no need for any timber or other framework; the concrete can be laid directly on the firm sides. Alternatively, anything which would prevent the soil from falling in can be used. Hard-board or strong cardboard can be used, even sheets of stout paper would do.

The shaping of the insides of the ponds is more important. Four pieces of plywood will be required, two for the sides and two for the ends. These pieces will be three-quarters of an inch shallower and shorter than the outside of the pond. They can be tapered slightly towards the bottom by marking off an eighth of an inch from each end at the bottom and chamfering off to nothing at the top. This makes their removal later on easier.

These pieces of ply can be painted with a bitumastic paint to preserve them. The end pieces must be cut so that they fit inside the side pieces when they are in position. Paint the formers with old sump oil on all parts which will come in contact with the concrete. Now mix one part of fresh cement to three parts of clean sharp sand. This should be grit varying from a quarter inch to fairly fine. Spread a layer three-quarters of an inch in depth over the bottom; do not mix with too much water for this concrete. Now place a quantity of concrete against one side and press the side former against it. The side will stay in position whilst you do the same to the other side. Now deal with the ends, so that when done the sides and ends stand in position with a three-quarters of an inch gap all round.

Now, with a slightly looser mix, fill the gaps, jabbing the whole time with a flat stick to make sure that the concrete is forced into all corners, especially at the base. Continue filling until the top is reached. A continual chopping with the stick on the concrete will ensure that all air is forced out and will prevent air holes being left. After a couple of days the formers on the inside can be removed. First run a thin-bladed knife along the edge to prevent the concrete edge being broken, and press each end piece inwards. These can then be lifted out and the sides will then come away easily.

The outer formers will have to be left in position, so the use of scrap material for this will be appreciated. The inside formers can now be cleaned ready to make the next

pond. When the concrete has set quite firmly the next part of the construction can be begun. Positions and sizes of the tanks will have to be decided so that the windows can be sited. A very good plan for the ambitious aquarist is to have three tiers of tanks along the length of each side of the fish house. The tanks can be housed on strong angle-iron frames with perhaps brick or concrete supports if the length is great. The lowest tanks can be about a foot above the ponds to allow for easy access. They can be a good width, 15-18 in., and the next row can be about 9 in. above these and less deep from front to back. A top row can be another 9 in. above the second row and narrower still. This allows light from above to reach all the tanks.

#### Lighting

With continuous rows of tanks like this it is not possible to have windows in the sides of the house, but a window can be placed at the end and also one in the door. The roof is the place where most light will have to enter. This can be almost all glass if required and constructed with glazing bars, or sections of it can be glass. For the person of wealth there is the possibility of using one of the corrugated transparent roofing tiles which fit in well with the corrugated asbestos roofing, and give all the light needed. Even Perspex can be obtained at a cost for this purpose.

The end away from the door can have a sink with run-away and a table to fit on for working. A shelf or two can be fitted there for accessories and foods, etc. If the door can be sited so that it does not face north or east this will be an advantage. If the fish house is small the door will have to open outwards. As a matter of fact, this type of door allows less wind to enter if it is used carefully when entering.

## SANSEVIERIA

by JACK HEMS

THE use of house-plants to enhance the appearance of the decorative aquarium has become very popular over the last few years; and there is no question that their employment as an artistic adjunct to the tastefully planted tank has done much to add to the popularity of the aquarium as a feature of modern room decoration.

The plant commonly known as bowstring hemp or mother-in-law's tongue (*Sansevieria*) is one of the most accommodating and, at the same time, one of the most aesthetically pleasing of exotic plants used for room decoration. For so long as its leaves are given a wipe every now and again to remove dust, which clogs the pores, and it is not overwatered—little or no water at all is the best policy to adopt during the winter time—it will retain its sculptural beauty almost indefinitely.

It will survive for weeks on end in a poor light, but it soon wilts if it is subjected to cold draughts; and a position on top of the tropical aquarium, or in close proximity to it, is just the place for it.

*S. trifasciata laurentii* is the species most often offered for sale in the florists' shops. This plant produces 2 feet long, sword-shaped leaves slightly waved along the golden-yellow edges. The leaves push up through the compost as tightly rolled spikes; and then proceed to unroll themselves into the typical flat sword-shape; that is, as they increase in length. The young leaves are always heavily marbled or mottled with varying shades of grey-green, silverish-green and yellow.

*Sansevieria* flourishes best in a small pot packed with equal amounts (in bulk) of leaf mould, peat, coarse sand and broken brick. The plant may be propagated by division of the rhizome, or by leaf-cuttings inserted for at

A fairly large tropical house could have double doors with a small porch between the two to save heat loss when entering or leaving.

When measuring the length for the number of tanks required, do allow at least an inch between each one; otherwise it will be difficult to remove any tank required. Also make sure that each tank can be readily reached for servicing.

Once the small ponds have been constructed and before any actual building is begun it will be an advantage to concrete the path along the centre of the house. A good smooth path will be a boon for ever after, and is much easier made before the actual house is built. It is possible to have double roofing, and in such a case it will be an advantage if the inner section can be removed in sections for cleaning purposes.

Any electric wiring and installations can be done when the house is finished. A good master switch and fusebox combined should always be fitted just inside the door. The heating of the tanks in a tropical house will best be done by individual immersion heaters. It will be found cheaper (with electricity) than trying to keep the whole house at about 75° F. all the time. Tanks not in use can have the heaters detached. Where a number of tanks are heated they will give off plenty of warmth for the house in general.

If space heating is preferred then a stove can be fitted to heat water pipes, but this means that the aquarist will have always to be on hand every morning and evening to clean and make up the boiler fire. An alternative method of space heating is by using gas to heat the boilers, and even an electric immersion heater can be used for the same purpose.

least two-thirds of their total length in sand enriched with some John Innes potting compost. An interesting point about propagating the plant from leaf-cuttings is that the new plants formed will not or very rarely reproduce the light-coloured edges to the leaves, or the mottlings.

*Sansevieria* is ideally suited to growing in the deep-sided dry vivarium housing lizards or certain species of snakes. It will even flourish in a rather humid, closed case containing frogs, salamanders and toads, so long as its pot is insulated against too much moisture, and nothing wet or damp such as *Helix* or *Tridacna* is permitted to grow around the base of the plant.

Readers may wonder how the term mother-in-law's tongue came to be applied to the plant. The answer is not very flattering: the name stems from the fact that the leaves are very long, and extremely bitter!

## Experiences with Unusual Fishes

(continued from page 2)

moniously into his new quarters. All eyes were on the limp form, slowly descending to the bottom, for signs of life, and I could almost feel the sense of relief from our friend when the octopus started to move about. An hour or so later, over a cup of tea, the laugh came when the collector told me that for the best part of the journey he had been pumping air into the can by means of a bicycle pump, and of the dirty looks he got to his reply of "An octopus" when asked by other passengers "What have you got in that can?"

There can be no doubt of the interest that comes from fish-keeping, and of all the various entertainments which are available to-day I would still give them a miss just to be on hand when a large consignment of fishes from overseas arrives to be sorted. I do not think there is anything more exciting than to open up the cans in the hope that a few will be entirely new to you.

# East is East . . . But West is Best

by L. R. BRIGHTWELL

I HAVE just put nearly 300 miles between myself and the sewer-swept coast of the Newhaven to Hove stretch of the English Channel. Writing this (in late January) at an open window framed in still obstinately flowering roses and fuchsias, with stone pines and palms rooted on the very fringe of the nearby sea, one naturally overflows with tender thoughts and kindly feelings for the area so recently vacated.

One can confidently predict therefore that in, say, 50 years' time the Portobello sewer, which in the last 6 years has virtually banished all inshore plant and animal life from Friar's Bay (near Newhaven) to Shoreham, will be diverted inland and nature will readjust herself. Fearing I might be merely an angry old man, I have for 6 years worked in close touch with the admirable biological departments of Brighton's two fine Colleges, as well as with the Field Club of the famous Varndean Grammar School, and our findings are unanimous. There's nothing like team-work in studying nature; the individual can all too easily jump to rash conclusions.

In 50 years therefore, the Colleges, instead of as now (with the sea on their doorsteps) purchasing "material" from Research Stations over 200 miles away, will dredge all that they want at minimum expense. The White Dover area being, as it is, fed by the Western Ocean, the Bay of Biscay and the North Sea, has well beyond sewage range a flora and fauna comparing well with that of Plymouth, Millport or Calleroats. Many happy trips on now vanished Newhaven trawlers have established this to the satisfaction of all my team workers.

Another 50 years may well see the once world-famous Brighton Aquarium regain much of its late Victorian glory. According to Brighton's local joke factory, it was entirely due to a careless clerical error, made in 1945, that monkeys found their way into the Aquarium and not, as was originally intended, into the Brighton Corporation Council chamber!

Still looking on the bright side therefore, 2 years of lecturing on Sussex marine life not only made me many friends but convinced me that the not-too-distant future should see Sussex marine naturalists enjoy all the privileges which should have been theirs long ago.

Only a year or so back I touched upon the beneficent wave of "marine aquariumitis" which has swept the smiling West Country in post-war years. Doubtless the proximity of Plymouth Aquarium, the mother lodge of marine biology, and close associations with Philip Henry Gosse, have much to do with it; geography and climate perhaps still more. A glance at the map will show that this corner of England has something in common with the Clyde area of Scotland, land-locked creeks taking the place of the famous firths. The amazing wealth of sub-tropic vegetation, within splash-reach of the sea is sufficient testimony to the climate. Marine-aquarium fans could have no more Halycon hunting ground.

The big grey top-shell, *Monodonta lineatus*, shares honours with the common wrinkle. In the nearby Isles of Scilly, really an isolated scrap of Cornwall, it is the accepted edible sea snail, the wrinkle for some reason being seldom found in Scillonia. In some of these densely wooded creeks I have actually picked up both the great and the queen scallop stranded at spring tides, also the parchment-tube worm *Chaetopterus*. It is common to lean over the boat's side and just scoop up scallops with a prawn net. Prawns are so abundant as to be slightly referred to as

"shrimps," and young hermits which do not come inshore further east until Easter are now scuttling everywhere in an amazing assemblage of shells, even in the beautiful wattle-trap and English stromb, or pelican's-foot (*Aporrhais*).

The plumose anemone (*Metridium*) can be collected at low tide, and any fine day sees tidal pools gorgeous with the fully expanded opelet (*Anemonia sulcata*). A year ago, the local naturalist caught, in a prawn net, the sea horse, which has only twice been recorded as a chance vagrant in Plymouth Sound. Sou'-west gales here mean bigger seas, but remove less roofs and chimney pots than in Sussex, and amongst the abundant jetsom is evidence that out in deep water must be scattered beds of the 18 inch long fan mussel *Perna*. In Italy there is a small tourist-trap factory where the byssus of this huge bivalve is woven into socks and neckties, though in England similar efforts have scarcely proved a get-rich-quick proposition.

The great spider crab, *Maja spinada*, has long been regarded as a summer "plague" in Sussex, and though a little trade in the big claws, at 1s. 6d. a pound, was done, 6 years of endeavour by the local fishery inspector and myself failed to put it, as in France and Spain, on the market. It was deemed too much trouble to de-shell the meat after boiling. Mevagissy has found the answer. Its crab-meat factory deals with the crabs in bulk. A compressed-air gadget simply blows the meat out of the shells, ready for deep-freeze or canning as required. Finally, the sea grass *Zostera*—all but exterminated by a mysterious disease in 1933—is in west Cornwall being slowly re-established!

Just now "fresh pitchards!" is the principal street cry of southern Cornwall, but presently all eyes will be on blue-shark fishing . . . £3 per rod, 10s. return for mere on-lookers. My new home is in the heart of Cornwall's oysterland, but good mussels can be had gratis, and the energetic dig for a variety of clams. The razor clam (*Ensis ensis*) is taken by an old Paignton device, a sort of giant corkscrew, which winks out a shellfish that burrows vertically at the rate of a foot per few seconds. On a coast where even the Mediterranean peacock weed, *Patonia*, and the star coral anemone, *Gorynactis*, make flowery big areas of sea floor, it is no wonder that marine aquarists are loath to leave this area, and all who can, like myself, stay. Falmouth's small but charming little Aquarium I hope to describe some other time.

Of course, no Eden is everyone's cup of tea. There are some who would regard this haven as too isolated. In fact it is proud of one of its local sayings: "One need not be crazy to live at Saint Halycon's . . . but it helps!"

## Cacti in the Fish House

MANY species of cacti can be raised from seed as easily as most other half-hardy plants. Sow the seeds in a pan of John Innes Seed Compost. Do not cover small seeds but just press in any large ones. Damp, cover with a piece of glass, shade and place in a warm spot. The top of a tropical tank will do well. Keep moist but not too wet whilst germination is taking place. Once a few seedlings are up give some air and light. No direct light from the sun must reach the seedlings whilst they are small or they will get a bad check.

THE AQUARIST

# Fancy Goldfish Breeding—14

by A. BOARDER

IN this series of articles all the fancy goldfish for which standards have been made by the Federation of British Aquatic Societies have been dealt with. There are, however, a few varieties sometimes seen at shows for which no standards have been introduced so far. There is little doubt that as the demand arises the new standards will be brought in. The prospective breeder of these varieties has therefore to plough a lone furrow, but just because he may be reluctant to show any of the fish does not mean that he has to forgo the pleasure of keeping and breeding these unusual types.

One of the most spectacular varieties is the celestial. This fish has been well known in this country for many years and it is very surprising that no standards have been made for it so far. Standards have been made for the lionhead and yet I do not see many more of these than I do celestials. One feature of the method of pointing fishes under the new Standards is the adoption of the five "venties" of points. I do not like this system for fancy goldfish, but it is suitable for judging any fish for which no standards have been made. Celestials could therefore be judged under this principle.

The eyes of the celestial goldfish are the important feature. These have been so developed that they have moved from the side of the head to above so that they are able to see only above them. They are quite grotesque and are not everyone's favourite. The fish should have divided tails and resemble the fantail in shape, but the best ones have no dorsal fin. Most seem fairly hardy and

## 14. Celestials, Bubble-Eyes, Pearl Scales

easy to keep. It might be supposed that owing to the peculiar placing of the eyes the fish would not be able to find their food. This is not the case, since they have a

very good sense of smell and so can feed quite well. It is not, however, a good plan to keep these fish with ordinary types of goldfish as they can get knocked around a bit by vigorous feeders.

Most of the celestials seen recently have been scaled, and nacreous types are not as yet very much in evidence. Although they are hardy enough to winter in an outdoor pond it is not a good policy to introduce such fish into a pond. There are so many other varieties much more suitable than celestials.

When breeding such fish the emphasis must be on the eyes. In the young the eyes are not so very different from those of ordinary goldfish, but they move up towards the top of the head as the fish grow. Only fish which have the eyes well placed should be used for breeding. The other features such as body shape and finnage can come later on.

The bubble-eye goldfish is another grotesque fish which has large water-bubble-like sacs round each eye. These can look like huge blisters and one is afraid to touch the fish for fear of breaking them. I cannot see these fish getting very popular as they cannot be considered handsome; they are just freaks. However, there are sure to be some aquarists who show a preference for this variety, but so far no standards have been made for them. Most fish of this variety seen here so far have been of the fantail type without a dorsal and with the huge bubble eyes. Many have been bred in this country and it has been found that they breed fairly true to type. Obviously there should not be any sharp-edged rockwork in the tank for these fish, as the possibility of damage to the delicate membrane round the eye would be too great.

Another variety of goldfish seen fairly often since the war is the pearl-scale. This fish is usually seen as a fantail in shape but the scales are slightly cup-shaped and so stand out in tiny bumps from the sides of the fish. There is nothing else about this variety to distinguish it from any other but, of course, all must be scaled or metallic, not

Bubble-eye goldfish; the sac-like development around the eye is well shown



Photo:

Laurence E. Perkins

Pearl-scale goldfish, a relatively recent importation from China

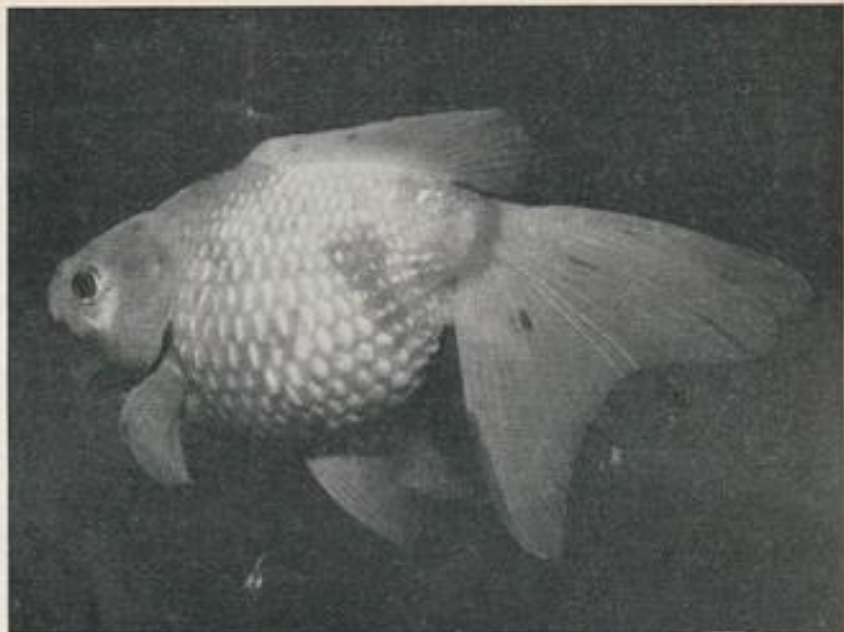


Photo:

Laurence E. Perkins

nacreous or matt. To establish a strain of pearl-scales, it will be necessary to try to pick out parent fish with good fantail shapes but with the cupped-shaped scales well developed. Obviously it would be useless to use any fish which had not the desired scales very evident. I do not think that a separate standard is required for this fish. All the Federation would have to do would be to state that in the fantail standards a variety with pearl scales would be recognised.

As the pearl-scale has a body shape similar to that of the fantail there is no special care needed in the breeding of this variety. It should be fairly hardy, but as a pond fish it would have no special value. The distinguishing pearl scales would not be evident in an open pond and so would not justify the inclusion of such a fish.

The pom-pom goldfish could be shown in any class for veiltails or fantails, which ever variety it favoured. Actually the name is given to those fish which have the nasal appendage very well developed. Some have large bulbous nasal flaps and some are even fringed. These can be quite an adornment and add to the unusual appearance of any fancy goldfish. This feature is mentioned in the Standards as applicable to fantails and veiltails.

With any of the varieties mentioned it is up to the owners to show such fish in the classes for any variety fancy goldfish. The judge could then assess them according to the recognised system of pointing. At most shows these days the fancy goldfish have to fight among themselves, and I have seen moors, veiltails, fantails, orandas, lionheads and even American sun-fish battling it out! Perhaps one day the hobby will become so organised that each show will provide at least one class for a specified fancy goldfish, and if agreement among the clubs could be reached it would be possible to get a class for each kind of fancy goldfish to itself at one show a year.

It is not to be thought that the varieties dealt with in this series comprise all the fancy goldfish. There are many more to be found in China and Japan. Some are occasionally

seen here and their pictures are also to be found. There is no doubt that several new varieties are likely to be seen in this country before long.

*(The next and concluding article of this series will deal with the preparation for and actual showing of fancy goldfish.)*

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## True Story

**A** WELL-KNOWN showman wanted 400 goldfish for a scheme he had in mind, so he despatched a driver and van to collect them. Later the same day, the showman, who needed the goldfish rather urgently, visited the garage to see if the driver had returned.

He decided to enter the garage by the rarely used rear entrance. As he opened the door, he spotted in the shadows a jam-jar full of water containing two forlorn-looking goldfish. The showman thereupon retraced his footsteps and entered the garage instead by the front entrance, where he found the driver.

"Have you brought the goldfish?" the showman enquired of the driver.

"Yes sir!" replied the driver dutifully, waving his hand in the direction of a nearby fish tank. The showman walked over to the tank with the driver and peered at its contents.

"How many goldfish did I ask you to fetch?" asked the showman.

"Four hundred, sir," replied the driver.

"Well I can see only 398 goldfish here," said the showman, in mock surprise, and he walked away to leave the driver puzzling over his employer's uncanny mathematical powers.



# AQUARIST'S Notebook



by

RAYMOND YATES

I MUST admit that my tanks are rarely troubled with white-spot disease and such odd visitations which occur have more nuisance value than anything else. Mercurochrome is the general standby for this pest and rarely fails. However, some time ago I found signs of the trouble in a tank with a large variety of fishes, some of which were not considered to be the type which can stand up to mercurochrome. As it happened I had some mercurochrome available but it was very old stuff indeed and this drug can be very doubtful when warm, very old or brand new.

The longer one is in the hobby the more fatalistic one becomes, and I decided to risk my usual proportions of two drops of a 2 per cent. solution of the mercurochrome per gallon. The only fishes which showed signs of the disease were clown loach and pompadours, two of the very species which are supposed to be allergic to this chemical. Most of the inhabitants of the tank showed no ill-effects but the *Palmatochromis* coloured up brilliantly and paradise fish lost much of their activity. The clown loach did not like the new situation at all and, far from hiding away, spent all their time as near the surface as possible, either resting on vegetation or on the thermostat wire holder or thermometer sucker, looking as near as fish can "the picture of misery." I felt that my three clowns were doomed, but hoped for the best. "One sera, sera" was the only realistic attitude to adopt. I ran aeration non-stop, which helped a great deal, but I soon realised that the clown loach would die if left as they were.

I then decided to remove about 6 gallons from the tank (30 gallons) every evening and added fresh water to which had been added 2 drops of mercurochrome per gallon. This certainly seemed to save the day. None of the other fishes took the disease and the clowns bucked up sufficiently when the fresh water was added to go on foraging expeditions. Clown loach roll and lie on one side normally and it is hard to tell when they are not pulling your leg, but when you are used to their habits (and they to yours) you know when they are in trouble. I found this outbreak very difficult to eradicate and it was a month before the tank was free.

During or soon after treatment several losses occurred; it is hard to say with old fishes why this happened but one tends to blame the treatment. Two large *Corydoras julii* catfish died within a week of each other, although *C. paleatus*, *C. arcuatus* and *C. myersi* were untroubled. Two neons also died; these gave the impression of respiratory trouble. I had thought the pompadours to be in danger from this drug but from start to finish no adverse effect was observed. On the contrary, I never had a moment's worry with this species.

I did lose one of the clown loach. In the fourth week of the treatment the only sign of the disease appeared to be on the smallest of the three clown loach. This was an undersized runt of a fish which had refused to grow and became stunted and unattractive. I decided to treat this specimen on its own and, deliberately, doubled the mercurochrome dose in its isolation tank. Two days later it was dead. It was no real loss but I felt that my tank treatment of 2 drops per gallon (with nightly changes and aeration) had been very near the point of no return as far as clowns were concerned. Some people in the past (including myself) have said that clown loach do not get white spot. From what I have seen they either prove immune in the thick of an epizootic or get it themselves when almost all other fishes are free. What a life!

I have found that with mercurochrome some fishes in time tend to get fungus growths on fins or tail. This will

often clear up when the water is eventually changed. However, it so happened that I had four *Aplocheilichthys lineatus*, of which two had badly bitten tails; these two developed fungus. I isolated both these fish and gave them a bath in mercurochrome and phenoxetol over 48 hours. All trace of the fungus had gone by then and I returned them to their tank.

Mercurochrome is hard on some plants and they can be removed from a tank to be treated and kept in a large bucket, preferably the white-enamelled variety, which can be filled with water and kept at tank temperature with the aid of a submersible thermostat. This drug dyes the water a greenish-red and tints the algae and mulm red, but fishes do not seem to be unduly affected by eating this stained algae or by rooting among the sediment on the bottom. Mercurochrome makes nasty stains on clothes but these can be removed by sponging with equal parts of water and alcohol, after which the stain can be loosened with glycerine. When the stain has almost disappeared wash with warm, soapy water and ammonia. With coloured fabrics the fastness of the colour should be ascertained in advance. In the tank there is no permanent stain; changing the water brings a gradual dilution. In small quantities the greenish glint in the water is quite as attractive as that obtained by using acriflavine, so often responsible for the "green water" seen in dealers' tanks.

Algae, like the poor, are always with us. Algae can be removed with a scraper or cotton wool and in other ways but there is often some which defies all attempts to eradicate it completely. Such a case is the type which embeds itself into the rubber of rubber tubing, thermometer suckers, electric wiring under water and so on. You can rub it with brushes, scrub, do what you will, it defies all efforts at its total destruction. I got over this difficulty by immersing the affected part in a strong solution of hydrogen peroxide. Ten minutes of this and your algae menace has gone.

The wives of some hobbyists probably consider all fishes as poisonous creatures, but most of our finny friends can be eaten without risk. However, there are exceptions and these can produce very unpleasant effects indeed. Fish is considered to be poisonous when toxic symptoms are produced by eating it. A venomous fish is one which can produce noxious effects through injury as a result of stinging spines, stings or teeth. Luis Marden, writing in the *National Geographic Magazine* (February 1956) gave some interesting information based on the work of Dr. Bruce Halsted, a man who has made a special study of ichthyotoxism. In one type of poisoning of this nature it appears that the tongue and lips begin to tingle, the sensation spreading to the hands and feet. Numbness sets in and an arm or leg swells to double its normal size, the pain being agonising. The patient sweats, skin eruptions occur with itching and paralysis or temporary blindness may follow. Some sufferers have complained that all their teeth are loose (an illusion). Sensations of heat and cold are reversed. Hot objects feel cold and a cold shower gives one the impression of being boiled alive. It is said that one victim who recovered blew on a dish of ice cream to cool it. An

example of such a dangerous customer to eat for dinner is the polka-dot trigger fish (*Balistoides niger*), whose victims can die of respiratory paralysis. There is no known antidote. The Manchester (Belle Vue) Aquarium had one of these fish on view last year.

I looked in at Blackpool Tower Aquarium in February, when one can really have a look at all the many tanks in peace and quiet. The fishes on view were excellent, as usual. There were quite a number of the less well-known fishes on show including the glass tetra (*Roeboides microlepis*), bleeding-heart tetra, *Nannostomus trifasciatus*, *Alestopetersius caudatus*, *ladigesii*, the unusual glass angels (*Gymnochanda filamentosa*), cardinal tetras, red-nosed tetras, dwarf cichlids in *Apistogramma reitzigi* and *A. ornatiplivis*, archers, kissing gouramies and *Leporinus*. Some chocolate gouramies took my eye; they seemed happy at 79° F. although many hobbyists have found them difficult, probably because they kept them at too low a temperature. They like 85° F. I noticed a number of new tanks being put in to add to the 41 existing tropical tanks. The enormous marine tanks were as vivid as ever and I noticed one with a 2 ft. corner crack on its inch-thick plate glass, which fronted a tank as large as the whole ground floor of many modern houses. I wondered what would happen if the glass gave way! It is surprising the number of very large specimens one sees with injuries; one in particular caught my eye, a huge golden orfe with a lump on its head as big as a tennis ball.

News on the hobby from beyond the iron curtain is hard to come by, but occasionally odd scraps of information crop up. Such an instance occurs in the fascinating book *Life in Russia* by Admiral Stevens (formerly naval attaché to the U.S. Embassy in Moscow). Moscow Zoo is in a small park near the city centre and is patronised by large crowds, half of which seem to be children. The Aquarium there is very small, half underground and always jam-packed. In the southern part of Moscow is the large Kalitnikosky market which does a retail business in animals. It is a big enclosure in a field opposite a cemetery. The fish section is entered through a lane lined with fishing poles, reels, lines and nets. Everyone who wants fishes takes their own containers, which are very hard to get. Glass jars contain goldfish, guppies, Siamese fighting fish and so on; even *Tubifex* is on sale. One tank contained tiny fish under an inch long, quite transparent but with a glittering sheen. These sold at 1 rouble each. The dealer advised visitors to buy a couple of these fish, which would make them rich because they would quickly have a tankful of progeny!

Mr. D. McCann Pullon, a well-known member of the Nottingham Aquarists' Society, wrote some notes on "Lighting the Aquarium" about 8 years ago for the club's magazine. These have now been re-issued and there are one or two points worth passing on to a wider circle of hobbyists. Mr. Pullon mentions that, as is well known, the lower frequencies of light which constitute the red end of the spectrum prove the most beneficial to plant growth. He suggests that as a general rule the cheaper the lamp the higher the proportion of "red" light in its radiation. In this connection lamps of less than 40 watts issued by some firms prove very suitable. Personally, I have found that 15 and 25 watt lamps purchased from a chain store are no less successful in plant growth than higher wattages, and I think Mr. Pullon makes a good point here. He considers the 25 watt lamp the best type for general use, particularly when the lamps are under-run, which lengthens the life of a lamp. He views with disfavour pearl or opal lamps, although for my own part I have a preference for these. However, the brightly coloured ones (used for Christmas

or outside illuminations) and the pink shades must be avoided as losses have been known through condensation and subsequent toxicity.

Mr. Pullon suggests that as the tropical areas get 12 hours of daylight this period can be adopted as standard for artificial illumination, with an hour or so each way making no appreciable difference. This is sound advice; most tanks are under-lighted, that is, they do not have artificial illumination for long enough. Mr. Pullon gives a table for calculating the number of 25 watt lamps needed for a tank containing a variety of plants. He suggests one 25 watt lamp per sq. ft. of surface for 12 in. deep tanks, one lamp per  $\frac{1}{2}$  sq. ft. of surface for 15 in. deep tanks and one lamp per  $\frac{1}{3}$  sq. ft. of surface for 18 in. deep tanks. He makes the excellent point that depth of water must be taken into account as the intensity of light decreases inversely with the square of the distance from the source of light. For example, if the light strength at 9 in. is  $x$  units, then the light strength at 18 in. will be  $x$  divided by  $2^2$ , or one-quarter of the strength at 9 in. He recommends more than one light for each tank, apart from the very smallest ones, as light is spread more evenly and plants grow more vertically than would otherwise be the case. If possible independent switching of each lamp is helpful, but this can be overcome by removing any bulb and inserting a dud where one of the lights is not needed for a time.

There is little authentic data on how fast fishes can swim and none worth mentioning on tropicals. However, it is interesting to consider certain aspects of this matter. As with most land animals few fishes can keep up a fast speed for long; they are built only for short bursts of speed for the purpose of catching their prey or evading danger. Recorded instances indicate salmon doing 26 and pike 20 miles per hour, and perch 12, roach 11 and carp 9 m.p.h. Dace, chub, barbel and bass can do about 7 m.p.h. according to French sources, and mullet up to 9 with rainbow trout up to 12. Sea fishes produce higher speeds, tunny being credited with 50 m.p.h. and sharks also probably reach this speed. Sail fish for short periods have reached 68 m.p.h. Marked fishes have given some information on long-distance swimming over a period; a salmon appears to have done 620 miles in 10 days and an eel 750 miles in 93 days. Hobbyists will agree that their own fishes can outdo all these—that is when a net appears over the tank and all the inmates disappear with the speed of light!

Whenever I am in Bolton I never fail to visit the free municipal Aquarium in the basement of the Art Gallery and Library. The 16 large tanks have always something worth seeing whatever the season. On my last visit (December 1957) I found fewer plants than usual but these are not missed in such enormous aquaria, three sides of which are "natural" rockwork. Silver sand had been used in some of the tanks and this contrasted well with some of the large freshwater fishes on view, although it is not so suitable for tropicals. Even finer sand was used in some tanks with very big river fishes, but no sediment appeared to be disturbed as one might have expected with such continuous movement as the fishes provided. Golden orfe when large lose their really attractive lemon colour and tend to be more buff, and (like so many of us) their waist line increases so that they seem far removed from the slender lines of youth. Many tanks contained fishes with terrapins, and some of the terrapins were really large (one as big as a saucer), but the fishes were not worried. One tank had 14 fancy goldfish which were a delight to watch.

Recently, a newcomer to the hobby told me of a wonderful fish he had seen which was a tropical but which I couldn't place. The description suggested a veiltail but he told me

(Please turn to page 14)

# An Enthusiast in Crewe

by RAYMOND YATES

TO most people Crewe brings to mind a huge railway junction, Rolls Royce works and the once popular song "Oh, Mister Porter." To me it has the bitter recollection of being the only place from which I missed the last train home after giving a lecture. To many aquarists, however, it means the home of Mr. Charles Perry, the well-known tropical-plant specialist and breeder.

An out-and-out enthusiast, Mr. Perry is no newcomer to the hobby. A lady friend of the family gave him at the tender age of five a 4 in. roach to play with (at least he assumed this was her intention), and this was kept in an old-fashioned earthenware bread mug. This contraption was provided with a wooden lid. Every time our budding hobbyist removed the lid to look at his pet the roach would turn over onto its side, reverting to an even keel once the lid was replaced. No explanation being forthcoming our young enthusiast determined to get to know more about fishes.

However, the years came and went and it was not until roughly 25 years ago that a visit to Blackpool Tower Aquarium rekindled interest in the hobby. A fish pond measuring in the region of 9 ft. long and 5 ft. deep, was duly built in the garden. Taking external advice on this project, Mr. Perry was told that half of it could be filled in as it was far too deep for plants. Not feeling inclined to comply with this seemingly defeatist advice Mr. Perry accordingly built concrete ledges at each end to accommodate the aquatics. During the war the pond was emptied and served as quite a reasonable air-raid shelter!

On the cessation of hostilities Mr. Perry found himself left with one shubunkin and one common goldfish, the former being a female. In those days fish were very scarce indeed and 50 of the offspring from this pair were disposed of to a Birmingham dealer at nearly 5 shillings each. It will be seen that at that time fish were almost worth their weight in gold! After this successful sale six scaled fantails were purchased from Mr. Boarder's stocks and two calico fantails obtained elsewhere. Breeding results were

highly successful but, after a few years, Mr. Perry turned to the tropical side of the hobby.

His most interesting breeding results have been with orange chromides, *Apistogramma ramirezi* and *Aphyosemon cognatum* and *A. ringa*, the two last-named varieties were crossed but the resultant hybrids proved sterile. Recently he has been breeding angels and *A. agassizi*, dwarf cichlids being his pet variety. For some years line-breeding of blue scarftail guppies and American flagtails has been undertaken, two consignments of these having been sent to U.S.A. (their original home)—which is coals to Newcastle with a vengeance! Mr. Perry estimates that he has bred about 50 different species since he started in the hobby, which is good going.

Although he has not bothered much with shows, partly because Crewe is some distance from the major centres, he has obtained first and second awards at the British Aquarists' Festival for his tropical plants and has also won major awards with his guppies, angels and breeding exhibits. His main fish house is roughly 18 ft. by 12 ft. and contains 90 tanks ranging from 14 in. to 5 ft. Heating is by paraffin and electricity.

As a successful supplier of tropical plants for the hobby I asked him if he had any hints or tips to pass on, but in his view there is little which can be added to what has already appeared in aquarium literature. To quote his actual words: "Mine just *have* to grow as they represent bread and butter." He believes in good light, not too fine a compost and a little peat to give them a start. The rest is just a matter of finding out by trial and error which tank suits which particular species best. For sending through the post plants are wrapped in old newspaper, re-wrapped in water-proof paper and forwarded in cardboard boxes. This method seems adequate, as no complaints have ever been made.

Beginners tend to expect too much of water plants newly planted. It takes time for a plant to establish itself and patience is needed. In the garden, at planting-out time, young seedlings are quite a long time before they pick up and growth becomes obvious. Some years ago I obtained some of Mr. Perry's spatterdocks, and these have been really wonderful plants, producing one new leaf weekly on each plant.

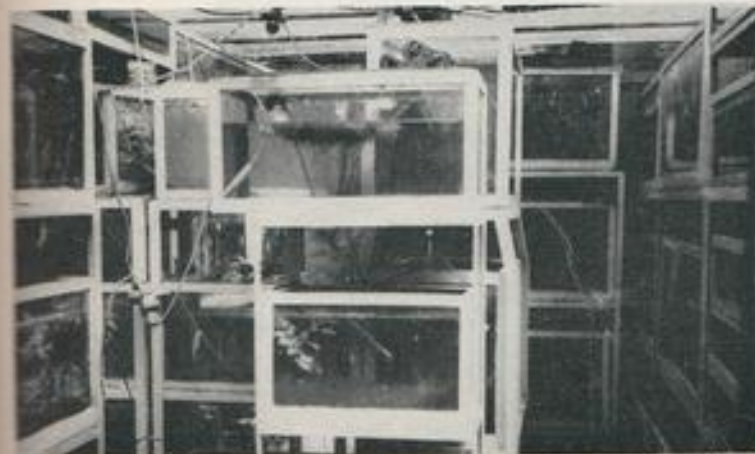


Photo 1

Raymond Yates

A corner of Mr. C. Perry's main fish house

# GOLDFISH FALLACIES

by N. E. PERKINS (Photographs by Laurence E. Perkins)

CONSIDERING that the goldfish is the oldest domesticated species of fish and that until the advent of the more easily maintained tropical aquarium it received the undivided attention of aquarists, it is really quite surprising to find that our knowledge concerning this creature is more than a little obscured by the numerous fallacies with which it is surrounded, and this notwithstanding the more recent specialist societies.

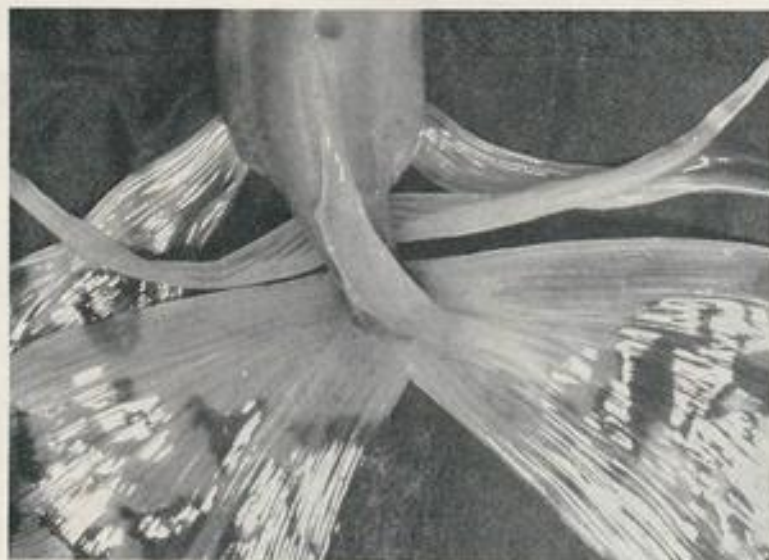
That we lag behind eastern technique in the production of the more bizarre forms is evidenced by the fact that these tend to lose the developed characteristics (such as cranial growth, protruding eyes, etc.) when bred in this country, even though bred from foreign parents which exhibit the characteristic to a marked degree. It is generally claimed that this is because we attempt to standardise too many characteristics at once, whereas such as the Chinese concentrate on the particular characteristic that separates the variety from others, i.e. upturned and enlarged eyes in the celestial.

This, however, appears to me to be not entirely true, for I well remember seeing upwards of 200 young celestials which had been flown in from China and all of which exhibited a remarkable conformity to pattern, most having reasonably divided finnage and twin anals as well as smooth backs and well-developed, correctly positioned eyes. I was lucky enough to secure a pair of these youngsters and have been breeding from them for the past 3 years, although it is only now that I am satisfied that some of this year's youngsters will equal the best parent for eye development. However, I am far from satisfied that they will equal what is considered good by the Chinese, for I do not think we see anything like their best fish over here at any time.

Having mentioned divided finnage it might be as well if

we examined this expression which is so frequently and unfortunately, erroneously used by goldfish enthusiasts and specialists alike. Many standards stipulate "fully divided caudals," though this is sometimes modified to "fully divided to the caudal peduncle." This creates the entirely erroneous impression that such fish exist, at least among show specimens. Now, while it would be foolish to say that such specimens have never existed (the goldfish being such a variable form) it is quite true to state categorically that they do not appear on the show bench. The very best specimens exhibit at least  $\frac{1}{2}$  in. of joined finnage, this consisting of very short rays, usually three in number, which overlap one another and most definitely project beyond the caudal peduncle. A web-tailed or partially web-tailed specimen will usually have more than three, the extra rays being progressively longer until the last extends on its own to act as the joining member.

Does the use of such specimens for breeding purposes immediately affect the offspring? Far too little research has been carried out for any definite answer to be given although, of course, we might rightly conclude that continued use of such types would eventually eliminate the true divided finnage altogether. From my experience the percentage of divided finnage from parents continually selected over the years for this particular feature is amazingly low—usually well below 50 per cent., and the use of partially web-tailed or even a fully web-tailed specimen as one of the parents has resulted in a similar percentage, there being no marked indication of an increase in web-tailed offspring. That this might follow in later generations has not been borne out by facts, but (and here the point is very important), should the imperfect fish so used have some other marked imperfection such as an upturned snout or twisted finnage,



View from above of the tail of a veiltail which is described as having a "fully divided caudal fin." The point of division occurs considerably beyond the caudal peduncle

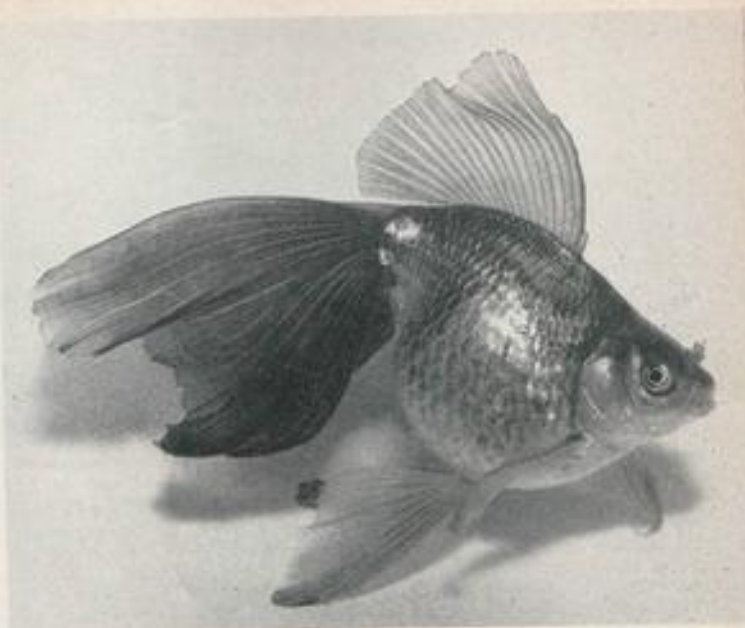
then it is more than probable that a very large number of the fry will exhibit the same feature.

Certain undesirable features seem to have a very dominant effect upon the young, pointed finnage and very long bodies being two such examples found when attempting to breed the veiltail, but there are many other apparently minor defects which show the same tendency. I am more than doubtful, though, that the use of a fish which differs from an ideal specimen merely by a degree of the amount by which the upper margins of the twin caudals are joined would materially affect the strain. However, it would appear that whilst every endeavour should be made to ensure the use of as near-perfect specimens for breeding as is possible, should a specimen arise which has some desired characteristic which is exceptionally well developed whilst also exhibiting some fault such as a single anal where two are required, or partial web-tails, then such a type should be used and careful records kept to ensure that a repeat performance does not occur with any of the offspring.

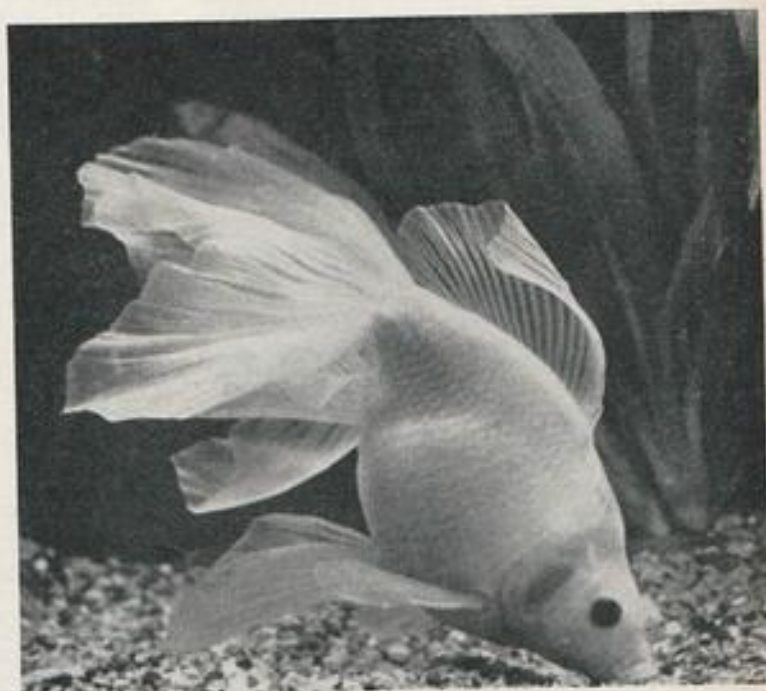
Generally, among the more fancy varieties the chief characteristic of the variety takes time to develop so that with normal culling during the fry stage such types as do show some excessive development will at least be reasonable specimens in other characteristics. I imagine that this is largely what has occurred in China, so that although a general conformity is aimed at by the selection of suitable types during the early stages of their growth, exception is made at a later stage where the main characteristic of the variety is of such quality that its inclusion in the strain, regardless of some other defects, is considered essential. Personally, I think they go further than this and proceed to line-breed that particular specimen.

Another fallacy concerning the more fancy varieties is that they must be maintained at 60° F. or above, and although many are now falling away from this view and suggesting that a period when the fish are allowed to go cold so that hibernation commences is not only beneficial but also assists the breeding cycle, they usually emphasise that such treatment must occur in aquaria as the fish will certainly not winter out. Now, unless the degree of coldness is going to be nicely adjusted and this carries with it some peculiar hazards such as dropsy and other complaints, the water in totally unheated aquaria in coldhouses is likely to occasion the fish far greater hardship than it would experience in a pond.

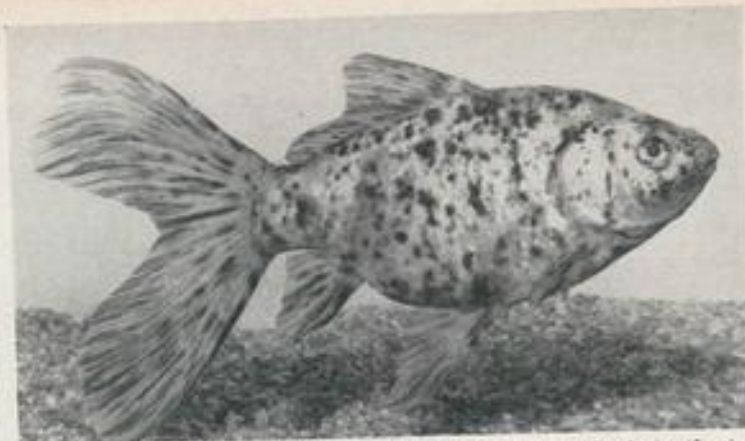
First of all, in very cold weather the water will be 4° C. colder than that of the lower levels of a reasonable pond



A veiltail that in the original system of three types of scaling in goldfish would be classed as "scaled" or "metallic"



Extreme opposite of the "metallic" type of scaling is shown by this veiltail, classified as "transparent" or "mat"



A "calico" or "nacreous" type of shubunkin in the three-type system of scale classification

since water is at its densest at 4° C. and water of this temperature will remain at the bottom of the pond, whereas with the aquaria heat is lost all round and the volume is sufficiently small to be completely cooled to 0° C. Moreover, on warm winter days the temperature of the aquarium water will rise accordingly, a factor causing considerable harm to the fish.

My view is that partial hibernation is bad, so that if the fish are not to be allowed to remain in a pond then their quarters had better be maintained at 50° F. so that they remain reasonably active. When fish are kept in outside pools for the summer period only it is advisable to remove them before the advent of the bad weather, since any interference with them after a few hard frosts is fraught with danger. I personally would never remove such fish unless the pool was so shallow that a complete freeze-up was possible, and even then would take care to keep them in the same water in as cool a place as was consistent with the temperature of this water; any attempt to raise it being brought about as slowly as possible.

Human beings have a peculiar habit of dividing, quite arbitrarily, certain forms of life into different groups and

proceeding from this to the foundation of "laws" concerning these groups. When subsequent events show that the "laws" do not always function, then other groups within the groups must be arranged to allow for this lapse of nature in failing to comply. Some years ago there was much talk of the three scale groups amongst the goldfish varieties. Some of us argued then that the neat division into three was hardly in accordance with observed facts, and that what was far more probable was that the scaling of goldfish varied from a condition where the greatest amount of iridescent factor was present through every conceivable phase to that of complete absence of iridescence.

I read now with some amusement that other types, suitably labelled "pseudo-nacreous," etc., are now being "discovered" and tested for genetical peculiarities. This quest for genetical laws amongst one of the most variable species is rather like trying to solve a jigsaw puzzle by cutting the existing pieces into still smaller particles, and appears to lead those concerned into a veritable maze of other innumerable possibilities whilst completely bemusing the newcomer to fish-keeping.

## Aquarist's Notebook

(continued from page 10)

it wasn't a goldfish. At last, quite baffled, I showed him a picture of a veiltail and, sure enough, that was it. He was flabbergasted to discover that this "angel" was still a goldfish. Bolton has five of these plus several comets and others, plus a dozen moors. I was delighted to observe a large pal fish quite 6 in. long, a size not often seen in aquaria. Unlike most of its type this one spent most of its time hiding under a ledge and did not indulge in wild dashes up and down the tank, although it had no companion pal. At this size the fish has intense colour, particularly in the white-tipped dorsal. Other giants were *Leporinus*, *Labeo bicolor* (several) and *Plecostomus*. Freshwater enthusiasts will enjoy seeing the large chub, dace, roach, rudd, perch, pike, eel, bream, some very active golden tench and orfe.

\* \* \*

Little is heard of the lamprey in Britain but this predatory horror (the sea lamprey) has caused untold havoc in the U.S.A. Over a period of 14 years the catch of lake trout

in Lake Huron diminished from 1,750,000 pounds to 1,000 pounds, and that from Lake Michigan fell from 5,000,000 pounds to 340,000 pounds approximately. Eel-like in shape, the lamprey reaches a length of 18 in. when full grown. It is provided with a rasp-sucker mouth which enables it to attach itself to any fish indefinitely and feed on its poor victim's life juices. Any variety of freshwater fish is attacked by this parasite fish but main losses are naturally most obvious in the trout population. A single adult female will lay over 60,000 eggs in the rivers and streams and the fry remain for up to 4 years before coming downstream to the lakes. Here science is at hand to help keep them at bay. Whilst the young lampreys are making their lakeward run they have to pass an electric underwater fence. This puts a barrier of 110 volts A.C. current in their way and either turns them back or immobilises them. It has proved most effective and up to 25,000 sea lampreys are stopped yearly by this means. Like the Pacific salmon, these fish die after spawning. Warm-blooded animals are immune from attack as the lamprey will not adhere for long to such a host. Apart from electric fences weirs also hold them back. It may be wondered how they ever succeeded in getting past Niagara Falls; the answer is that they go by way of the water in the man-made canals.

# PERMA BLACK MOLLIES

by C. WRIGHT

ON quite a number of occasions I have been asked to write something about black mollies as it is well known that I have a very good strain of these beauties. But instead of writing about mollies in general I have decided to give my own experiences, which may or may not assist a beginner to make up his mind whether to keep them or pass over to the more brilliantly coloured fishes.

As I sit here I have in full vision a 6 ft. tank containing a trio and some 60 young about three-quarters of an inch in length—a very fine sight; but if it is a showy community tank you want, then I can think of nothing better than mollies mixed with good red platys. Try it and see for yourself.

My breeding stock are the offspring of a trio purchased in 1938. I mention this because in spite of what has been written about in-breeding, this strain has had no outside blood introduced in all that time, nearly 20 years; in spite of that the young are born jet-black with no vestige of silver, even the eyes are not visible. Now I will tell you how I nearly lost this strain.

In 1949 I was able to secure a good male midnight molly, straight from America, with a nice large dorsal fin trimmed with orange. Although the body colour of my own mollies was far superior, I had ideas about giving them this lovely dorsal fin. I immediately set aside three tanks, one 18 in. by 10 in. by 10 in. and two 24 in. by 12 in. by 12 in., which I numbered 1, 2 and 3. In no. 1 tank (18 in. by 10 in. by 10 in.) I placed the male and in tanks 2 and 3 a single fish, the largest of a brood about 5 weeks old and which looked to me like developing into females. These were given special attention and at 4 months were really nice fish, but only one was a female. Nevertheless, I had what I wanted, a virgin female. I waited till she was 5 months old, then placed her in tank no. 1 with the male midnight molly and left the two large tanks without fish.

As you may guess, these tanks had by now a luxuriant growth of plants, all *Vallisneria spiralis*, and were well seasoned. Seven weeks later I was rewarded with my first brood of six youngsters, which to my dismay looked like guppies; but in a week they started to develop a speckled appearance. At 2 weeks old I put them into tank no. 2 (24 in. by 12 in. by 12 in.) to grow on.

Thirty days after the first brood the female delivered a nice batch of 36 young, but only three showed any trace of black on them. These I put into tank no. 3, and the rest into tank no. 2 with the rest of the first brood, a very disappointed man. They followed the same pattern as the first brood, but as they grew so did the amount of black increase until at 4 months they were a decent speckled molly and very attractive (at least they sold well!).

The three with black turned out to be of fairly good colour compared with the rest and were two males and one female. The two males were placed in a community tank of egg-layers to grow on. The female was left on her own until she was 5 months old. In the meantime the parents had been separated, after the last brood, by a glass partition across the tank. The female produced two more broods at 29 days intervals, then no more for 3 months so I considered that she was clear.

My next move was to take the parent male and put him with his daughter, who by now had occupied tank no. 2 for nearly 3 months on her own. Then I took the largest of the two males from the community tank and placed him in the small tank no. 1 with his mother, the youngsters by

now being nearly three-quarters of the size of the parents.

Once again the game of patience had started. This time it was 11 weeks before I had the first batch. This was in tank no. 1, the female dying after delivering four young, which once again disappointed me by having only a very small percentage of black pigmentation. By this time I had disposed of all the young in tank no. 2, so in there the youngsters went. Three weeks later the young female had her first brood of six, still with only a small percentage of black but the largest in size that I had had so far.

I started the waiting game for them to be of a size for breeding. This time I put father to grand-daughter, half-brother to half-sister and brother to sister. By the time I had results from these nearly 2 years had elapsed since I started, so I took a careful stock of what I had achieved. The result was very disappointing. I had some fish near-black at birth that eventually took about 7 months to become all-black, but even then they lacked that black lustre which was the pride of my own originals and which were still producing jet-blacks at birth.

While I had been playing with the others I had also been selectively breeding them, playing all the time on a large dorsal fin, and I had a small amount of success, the fin being higher and about half as long again. I decided to call a halt on experiments and to breed once again for the market, but more than satisfied that the purchasers would have good value for their money. In the first 12 months I raised 2,248 for sale, and all real good fish. This, from six females, I think was a good total.

My method for raising this total was unorthodox but nevertheless gave good results. The parents were housed in three breeding tanks. I had three females and two good males in tank no. 1, which was 72 in. by 12 in. by 10 in. with a glass partition 18 in. from one end. By juggling with the heaters I was able to keep this end always about 4° warmer than the main body, then, when I knew that a certain female was about to deliver or was a few days' overdue, I netted her gently into the warmer water and results were generally achieved within a few hours.

The young were then removed to their growing quarters as soon as I could manage it (usually within 48 hours). I suffered a few losses this way but not enough to worry about, as final figures proved. The actual number of fish raised to maturity (about 12 weeks) from this tank (6th February, 1952 to 13th February, 1953) was 997.

Breeding tank no. 2 was 36 in. by 12 in. by 12 in. and contained a nice trio, and from 6th February, 1952 to 19th February, 1953, 846 fish were reared from this tank. Tank no. 3 was a 24 in. by 12 in. by 12 in. and contained a picked pair from the spawning of 6th February in no. 1 tank. These had been separated until I thought that they were fit for breeding. The actual date of putting them together I have not got, but as the first shoal of young appeared on 3rd July, 1952, I should say that it was about the end of May, when they were about 4 months old. From then until 20th March, 1953, I reared 153; these figures are authentic and have been copied from my book of notes kept in the fish room. Nowhere in that book can I find mention made of any fish that were not all-black at birth.

Now for a few words about conditions, feeding, etc. First the tanks: they were a disgrace to any pisciculturist in that at the end of the 12 months the sand was covered with from 1 to 3 in. of mulm, but they were really thick with plants (*Vallisneria spiralis*). The only attention that

they had in that time was when the plants were so thick that the fish could not pick up from the bottom any food that was missed (I think that this was on about two occasions). I leave the reader to imagine the "fog" that arose when sorting out did take place! None the more for that, within 48 hours the water was crystal clear again, with a nice lot of young plants and a little extra depth of mulm. Never at any time was the water green or was there any excess of algae; under these conditions I had far better results than I have had before or since under what are considered to be ideal conditions.

My tanks in the fish house were nearly always as green as grass and the fish only seen when they nearly touched the front glass; the burning question now is, do mollies want green water or nice clean water like the platy family? Leave me alone and I will play for hours at fish-keeping! I must mention, before passing on to feeding, that never at any time have I used salts of any description: all water has been taken from the ordinary house supply and the pH, for those who may be interested, is a fairly constant 7.4.

Foods consist of Bemax, whalemeat, spinach, dried *Daphnia* and any type of bonemeal that I can get; these are mixed to a thick paste and dried in the gas oven. When really dry it is broken up into small pieces and put through a coffee grinder (who worries?—we don't drink coffee!) and ground into three grades, including one which is like dust itself. Live foods include *Daphnia* (when I can get it) and *Tubifex* worms (which I must say, to the horror of a lot of aquarists, that I use a great deal). The young are fed on micro worms and dust-fine dried food from the day they are born and on this feeding make remarkable growth.

I do not wish to tell readers that this is the correct way to breed mollies, but merely to convey to them my own methods (right or wrong) and my experiences with these charming fish.

My last words to beginners are: should you decide to do any breeding yourself with any type of fish, make sure that you have a note book hanging on a convenient hook near the tanks so that it is no trouble to jot down your remarks. This article is built up from such notes.

## Flowering Rush of the Pond-side

by WILLIAM J. HOWES

AT first sight the aquarist will find it hard to believe that this charming wild flower is a native to Britain. It is very widely distributed, though it is, of course, local in the sense that it grows only in marshes and at the sides of lakes, pools, rivers and streams. When the flowering rush is really established in large clumps it presents an imposing sight when grouped beside the more usual irises at the waterside.

The foliage of flowering rush is attractive and, as its name implies, it is rush-like in appearance. It has long sword-shaped leaves which form an attractive contrast with the umbels of dainty rose-pink flowers growing on stems some 3 or 4 ft. high. Incidentally, the flowering rush (*Butomus umbellatus*) has an alternative, but much less appropriate, name of water gladiolus.

However, though *B. umbellatus* has quite a wide distribution and is sometimes even said to be "common," it is well worth introducing to the garden pool. It is an aquatic, and therefore this flowering rush will prefer to have its roots right under the water. Provision should be made for this when it is to be introduced to the garden pool, for it certainly grows best when in water 3 to 6 in. deep at the pond edge.

I have found that these moisture-loving plants may be transplanted quite successfully at almost any time of the year, but the best time for planting and dividing is after the flowering period, for it is best not to disturb it when actually in bloom. In fact, if the

aquarist cares to wait, its seeds may be gathered and sown and these normally set freely.

When it has become established in the margin of the garden pool, and finds conditions to its liking, it is more than able to hold its own among the other plants. Indeed, as with our native yellow flag iris (*Iris pseudacorus*) it is quite capable of increasing at an alarming rate, and therefore has to be rigorously trimmed to keep it under control or it may well smother its less vigorous companions of the pond-side!

The aquarist may well know that such pond-side plants as this serve a useful purpose. They are also extremely decorative, for they make the average garden pool look quite natural and therefore pleasing to the eye of any enthusiast.



Photo:

Flowering rush (*Butomus umbellatus*) growing wild at the edge of a lake

W. J. Howes



# The Garden Pond in April by ASTILBES

**A**PRIL is the month most pondkeepers have been looking forward to, for now is the time to plant up a new pond or to transplant any subjects needing this treatment. Most plants in an established pond will have now commenced to grow, and towards the end of the month it is possible that some of the fishes may spawn. Many readers will have constructed new ponds, and so a few notes on their treatment will be given first.

Once a pond has been constructed it is a good plan to keep it filled with water, so that the concrete sets firmly and most of the lime which could injure fishes can be cleared. The best way to do this is to leave the pond filled with water soaking for at least a week, then empty and scrub well with a stiff broom. Fill the pond again, leave for a week or so and then repeat the cleansing. If a pond has been filled and left for most of the winter then it should be quite safe if emptied, cleaned and refilled. Remember that all newly made concrete ponds are likely to be dangerous to inhabitants unless the free lime is cleaned off before any fishes are placed in the pond.

A small amount of lime is not likely to do much harm and the amount likely to be found in the water depends a great deal on the depth of the pond. A shallow pond will contain less water and yet can have almost as much surface area of concrete as a deeper pond. The concentration of free lime is the danger, and so it can be well understood that the greater the volume of water the less will that concentration be. Some people who make a pond are too eager to get plants and fishes in, and cannot wait until the water is in good condition first.

The surest way to success is to plant the pond up and then wait until some of the water plants grow before placing any fishes in the water. Once some active growth of the plants is seen it will be found that the water becomes more suitable for the fishes. They will also feel more at home with some shelter available than if they were placed too soon in a freshly made and planted pond. A little patience now can save a lot of worry later on. After all, good fishes are not cheap and so it seems senseless to take risks.

The next problem with a new pond is whether to place soil or sand at the bottom in which to set the plants or to leave the base quite clear and plant in pots or pans. I have no hesitation in advising pondkeepers to abstain from placing any soil or sand in the pond. Keep the base quite clear and plant all subjects in suitable pots or pans. Even the use of earthenware or concrete boxes is to be preferred to planting in open soil. The average garden pond made with concrete will collect a great deal of dirt and filth in the form of falling soot, dust and the matter from decaying vegetation, to say nothing of the droppings from the fish and snails. Unless this is cleaned from the pond annually it is possible to so pollute the water that the fishes become ill, contract fungus disease and die. Added to that is the possibility that the depth of the water will gradually lessen, as it is probable that at least an inch of mulm can collect in a pond each year.

Another point often lost sight of is that any water plants placed directly into soil at the pond's bottom will grow very rampantly and will prove very difficult to keep under control. A new pond will always look a bit bare for a start but, after all, you could not expect to plant a garden and have everything in flower in a few days. There is no doubt, provided that everything has been correctly planted, water plants will soon make luxuriant growth, and what was an empty concrete pond in April can be a splendid sight by June or July.

All types of water plants can be planted in April, and if



Photo:

Laurence E. Perkins

Hornwort (*Ceratophyllum demersum*), a useful underwater plant for the pond

water lilies have been ordered, this month is when they will usually arrive. All fairly strong rooting plants like the lilies should have a large pot with sufficient good loam to provide nourishment to get the plant well started. Later on it will be found that some of the roots leave the pot and spread out over the base of the pond in search of extra nourishment. This is quite all right and will not prevent the removal of the container when this is required for cleaning purposes. Any tall flower pot can be made and prevented from falling over by arranging a quantity of concrete round its base. An easy way to do this is to place a shovelful of concrete on some newspaper and press the base of the pot into it; then allow it to set for a few days and remove the paper.

All types of underwater oxygenating plants can be planted in small pans or even plastic or concrete boxes. Most of these plants soon make rampant growth and may send out roots all over the place. They can, however, be controlled quite easily by pulling out or cutting off the surplus growth. It is probable that many readers new to pondkeeping will place too much emphasis on the oxygenating plants. It appears general knowledge among most beginners that underwater plants are an absolute necessity and that no fishes could live for long in any pond without them. This is not true, as any pond with a reasonable surface area will extract enough oxygen from the atmosphere to satisfy the fishes. In fact, fishes could be kept for unlimited periods

in ponds which did not contain a single water plant. They are, however, useful for the fishes to spawn in, also they provide a good deal of food for certain species of fish. If controlled breeding is to be carried out in the pond, when the eggs have to be taken away for incubation, then it is not a good plan to have underwater plants growing all over the pond. It is far better to keep the pond fairly clear and to place bunches of water plants only at the shallow part of the pond so that the eggs can be collected quite easily once laid.

Established ponds will probably need some attention now, but this will depend on how long the pond has been made. After about 3 years it is almost certain that some of the plants will have grown to such an extent that there is a danger of overcrowding. A pond which has looked beautiful for a few years can become so over-grown that the surface of the water is completely covered by leaves.

The pond will then lose its beauty but can be soon made to return to normal by some judicious pruning. If the plants had been set in removable containers in the first place it will be an easy task to slide them from the pond for treatment. The root-stocks of water lilies can be cut with a sharp knife, and remember that it is better when dividing to discard as much as possible of the old stock and retain the newer growth from near the outside. Some fresh loam may be needed to replant the lily, as it is surprising how the

soil can disappear from a pot immersed in a pond for a year or so. Some well-rotted turf is as good as anything for this job as the fibre among it will tend to keep the soil in the pot.

Do not worry if the water turns green at this time of the year. The increasing power of the sun will encourage the formation of green algae, tiny water plants, and these will soon thrive and fill the pond. Algae is unsightly but not harmful to fishes. It is an oxygenator but if it gets very dense it can check the growth of the other water plants, especially those which have been freshly planted.

It is often stated that it is of no use emptying a pond and refilling as the new water would soon get green again. However, I consider that it is a very good plan to empty and refill when freshly planted water plants are in the pond. The fresh water will not go green for some days and this will give the plants a chance to grow. When they do get well established it is probable that they will choke out most of the green algae and the water will become clear.

A good method to adopt when the pond is new and the water plants have not yet grown up strongly, is almost to cover the surface of the pond with duckweed, which will cut out much of the sunlight from the water and check the growth of the algae. Once the other plants have grown well the duckweed can be removed either by nets or flushing off with a hose.

## Herring Alive-o!

**I**N an East Anglian newspaper very recently there appeared a photograph of a *live* herring, reportedly the first ever seen in Yarmouth, where millions of herring are landed every autumn.

This fortunate fish was seen swimming in a barrel of salt water that had been left on the deck of a drifter at sea. It was concluded that it had fallen from the net as the catch was being put into the hold, and the crew decided to bring it back alive. A Peterhead expert at Yarmouth said that in his 50 years' experience he had never known a herring to live more than an hour or two in attempts to fetch them back.

So, after the good folk of Yarmouth had looked at their first *swimming* herring, the fish was taken out to sea and put overboard in the region where it had been caught—a pleasing bit of sentiment, surely . . . in the Aquarium at Corstorphine Park some herring were kept alive for *almost 4 years!*

Mr. Tom Beveridge, curator at the Aquarium, explained that the difficulty of keeping a herring alive out of the sea is its "softness." Damage to even a few scales is sufficient to kill it off within a short time. There are other factors to be taken into account—the time of year when it is caught; whether it is caught before or after spawning; the temperature of the water in which it is kept; and so on. Considerable external and internal damage is done to herring in trawl nets—perhaps only a few out of thousands netted are completely unblemished.

The herring which were kept alive for nearly 4 years at Edinburgh Zoo were caught by Mr. George Wilson, a Newhaven trawler skipper, before the Second World War. Mr. Wilson previously had given many herring to the Aquarium, but none of these had survived for long. Then he had the idea of not hauling his net until the fish broke the surface. He lifted each herring out individually in a bucket, and later sent 28 more fish to the Zoo.

"They might have been living yet," said Mr. Beveridge, "but, during the war, when the Home Guard were carrying out an exercise on a nearby golf course, explosions loosened rocks in the herring tanks. The disturbance in the water,

the falling stones, and the lime from the stone, killed all the fish quite quickly."

He has tried a few times since then, and, while he has managed to keep herring for four and a half to five months, he has never come anywhere near to matching that earlier record.

—*Edinburgh Evening News.*

## Cover Picture



Photo: Laurence E. Perkins  
As the pond comes to life in spring it attracts these aquarists-to-be. This year it is tadpoles and sticklebacks—one day it might be *Daphnia* for the fishes at home

THE AQUARIST

## OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

I have been toying with the idea of keeping a sort of log-book, setting out my achievements in breeding the rarer species of "tropicals." I wonder whether you could give me some idea how to set this book out, and guide me with regard to appropriate headings?

Your best plan would be to use large white or coloured index cards procurable from a stationer's shop specialising in office requirements. The cards should be ruled up and headings provided such as temperature at the time of spawning, pH of the water, colour and composition of the compost, plant life (if any) and species, position of aquarium (that is in relation to a window) or strength of artificial light, date when the fishes spawned and so forth. Each card should have the name of the fish (scientific name) printed in bold capitals. The cards should be filed in alphabetical order, so that it is only a matter of moments to turn up all the details of a given species.

I have just purchased a 18 in. by 10 in. by 10 in. tropical aquarium. Would you please suggest six pairs of fishes that I could house in this aquarium without any danger from overcrowding?

The following fishes (single pairs of each species) would live very well in your aquarium: white-cloud-mountain minnows, guppies, flame fish, *Barbus schubertii* and *Pristella riddlei*.

The hood on top of my aquarium is made of aluminium, and the light sockets are of brass. I have been told that as the water condensing inside the hood and on the brass sockets drops back into the aquarium it will poison the water. Is this true? If so, what should I do to remedy the situation?

Your best plan would be to paint the inside of the hood with two thin coats of a high-class white enamel paint. The brass sockets may be covered with rubber sleeves cut from an old cycle inner tube. Drops of water falling back into the aquarium from metal objects such as brass will, in time, have an adverse effect on the health of the fishes.

I am thinking of placing a glass division across the centre of my aquarium so as to make two separate compartments. Will it be all right if I paint the glass sheet green?

So long as the painted glass sheet is given a good soaking in several changes of water, it should not do any harm. However, a natural growth of algae on the glass would be more satisfactory. If the sheet of glass is placed in a bucket of water and stood outdoors where sunlight can reach it, the surface of the glass will soon become coated with a bright green mossy growth.

I have a plant of *Spongeton alveatus* in my tropical aquarium, but it has grown very stringy, and the leaves just lay on the top of the water. How can I produce a more robust growth?

Plant the corm in a small pot containing a mixture of clay and ordinary garden soil topped with an inch or so of coarse sand. Give the plant plenty of bright top light. You will soon note a remarkable improvement in the plant's appearance.

Please will you tell me the sort of conditions that silver fishes (*Momotactylidae*) like best?

The silver fishes live, in the wild state, in salt and brackish waters, and often ascend some distance up rivers. But they often flourish quite well in ordinary freshwater. It would be advisable, however, to add some evaporated sea salt to the water in their aquarium, and maintain the temperature at between 75° and 80°F. They need plenty of live food and meaty food to keep them in good condition.

I am very handy with tools, and wonder whether it would be a worthwhile proposition to make a wood aquarium for housing tropical fishes?

Aquaria made of wood usually turn out very successful for either coldwater or tropical fishes. But use well-

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Many queries from readers of "The Aquarist" are answered by post each month, all aspects of fish-keeping being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent so that a direct reply can be given.

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seasoned teak, oak, cedar or mahogany rather than other wood for their construction. And use iron nails or screws for joining the sections rather than brass. The aquarium should be glazed in the usual way with a proprietary cement or one made of well-kneaded putty mixed with some dry red lead. Give the aquarium a very good soaking in several changes of water before furnishing it with plants or fishes.

Please tell me the best conditions to suit mollies. I wish to breed them successfully.

Mollies need plenty of swimming space in well-oxygenated water. A 24 in. by 12 in. by 12 in. tank stood in a brightly lit position suits them best. That is, for one pair or a trio. As the species appreciate slightly saline water, a level teaspoonful of evaporated sea salt may be added to every gallon of water contained in the tank. This degree of salinity should not have any adverse effect on the plant life. Feathery-foliaged plants or a mat of floating plants such as *Salvinia* should be provided to offer hiding places for the fry. A temperature between 72° and 75°F. is about right. Mollies prefer a lot of vegetable matter in their diet, and plenty of duckweed, algae and finely chopped cooked spinach is always appreciated.

Are bumble-bee fish (*Brachygebius xanthazona*) easy to breed in captivity?

Bumble-bee fish are not easy to breed in the aquarium. Perhaps it would be more correct to say that they do not spawn freely in captivity. When they do spawn, however, they usually deposit their eggs underneath a stone or inside a flower pot. After fertilisation, the male assumes care of the eggs. The eggs hatch out in about 5 days, and become free-swimming about 2 days later. The fry require the usual microscopic live food (Infusoria) until they are big enough to eat micro worms and the like.

Is there any danger attaching to the use of glass wool as a filtering medium?

We are not over-fond of glass wool as a filtering medium. Fragments of glass wool often have the habit of working into the skin and under the nails of the aquarist using it; and we do think that splinters of glass wool can cause distress to the fishes if tiny splinters of it stick in their sides. We always favour charcoal, coarse sand or ordinary cotton wool to pack a filter.

Will the application of extra heat alone cure white-spot disease?

Although many authorities say that extra heat coupled with certain chemical preparations should be used to treat an outbreak of white-spot disease, we have usually found that extra heat alone will cure the disease if it has not taken too great a hold on the fishes. Maintain a temperature 10 or more degrees above the normal for a week to 9 days and, during this time, siphon the bottom of the aquarium as often as possible; that is to say at least once every day. Add fresh water heated to the same temperature to make good the loss of the water drawn off. After the spots have cleared from the fishes, keep the temperature up for a few days, and then, very gradually, permit the temperature to sink back to its former level.

# our readers



# write

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.

## Alien Introductions

IN the February issue a correspondent (Mr. E. J. Druce of Birmingham) takes me to task for advocating the introduction by aquarists of fishes and plants to suitable waters which are devoid of these varieties. He refers to the introduction of Canadian pond weed and the elimination of fairy shrimp in midland areas. Strangely enough, he forgets the other two popular bogies of the "leave-things-alone brigade," the rabbit in Australia and the grey squirrel here.

It is hard to know just what he has in mind but it seems likely that he is worried about angling waters having extra vegetation introduced or further species of fishes which would perhaps compete with the present inhabitants for the available food supply. He uses the word "alien," which seems rather out of place when one considers that most of the plants grown in our gardens and vegetable plots are aliens. Of the 17 different coniferous trees which occur in Britain only three are native. In recent years the bitterling has established itself in certain areas of Britain—surely not an undesirable alien? Wheat, the very staff of life, as far as we are concerned, is an alien, being derived from an Asiatic grass.

Frankly, I feel Mr. Druce's objections are based solely on the horror he experiences at the thought of somebody introducing English fishes like minnows or gudgeon to his favourite angling water. Of all the fishes which we have in this country, two, minnows and rudd, have nothing like the distribution they deserve. The onset of industrialism coupled with the depredations of anglers of all ages have made many waters fishless, and the general public does not give two hoots for this vanishing wild-life frontier. The tendency nowadays seems to be that fishes should be seen only in aquaria, they have no right of consideration against sewage, road spraying and detergents.

In spite of Mr. Druce's points I fear I must continue to advocate increasing the fishy population by introducing "lost" varieties to those waters which are in need, and they are many. As regards plants, most of our semi-urban waters sport but two or three plant varieties and some of the not-so-often-seen aquarium varieties could well be introduced. Of course, plants have to be put where they belong; some like soft water, others hard, some stagnant, some rapid streams. To mention a few, we could do with more willow moss, hornwort, frog bit, water violet, water-cress, bog bean and cold water *Vallisneria*. In some areas all these are plentiful, in others none exists.

Mr. Druce mentions the Canadian pond weed, which he describes as "Barrington's curse." This expression dates back far into the last century. Mr. Druce omits to mention

Address letters to The Editor, *The Aquarist*,  
The Butts, Half Acre, Brentford, Middlesex

that after this plant had, in fact, run riot, it suddenly began to wane and die off and has never since caused alarm.

RAYMOND YATES,  
South Levenshulme, Manchester.

I AGREE with Mr. E. J. Druce (*The Aquarist*, February) about the introduction of weeds into various waters. They can carry algae spores which could grow and soon fill a pond and cause no end of trouble to anglers, who may have spent money and time to improve their waters.

To put minnows in waters is bad enough—but sticklebacks! Never! They are our greatest pest and nuisance, and more besides, once sticklebacks are in, they are almost impossible to get rid of.

If my fellow anglers caught me putting "cockies" in they would have me in as well.

H. CHORLTON,  
Bolton, Lancs.

## Wrong Newt

MAY I point out that the caption to the lower photograph on page 259 of your March issue should read male smooth newt, *Triturus vulgaris*, and not male crested newt.

JOHN CLEGG,  
Curator, Haslemere Educational Museum,  
Haslemere, Surrey.

Our apologies are offered to readers for this slip.—EDITOR.

## Unusual Spawning

INDEPENDENT Aquarist Society member, Mrs. Joyce, on looking into her community tank had a very pleasant surprise, for she saw a baby neon tetra which appeared to be only a few days old, swimming freely. Anxious not to lose this prize possession she transferred it to a floating container and hopes to rear it. At the time of writing it is 10 days since her discovery and the fish is doing well. The tank in which it was found contains 20 neons, several other characins and guppies. This must be one of the very few instances of a neon spawning and hatching in a community tank on record.

N. D. HUDSON,  
Independent Aquarist Society.

## Observations

A FEW weeks ago I completely emptied an aquarium (24 in. by 12 in.) and re-set all the compost, plants, etc., and placed the fishes in their new home (a 18 in. by 10 in. tank). The fishes, mainly guppies, included a fantail goldfish which since its purchase has had some

black pigment on its fins and body. When the water in my newly set-up tank turned green I switched the overhead lights off for a few days, in which time the water became crystal clear, but to my great surprise the fantail was seen to have lost all its blackness. Has any other fish-keeper had this experience?

Another point which interests me is that when I top up my tropical tank with water direct from the taps—mixed hot and cold, a number of snails die off each time, and now none is left in this tank. I have also a coldwater tank which needs regular renewal of the water as its occupants are axolotls, but the queer thing is that the snails in this tank remain active and thriving. Heated water straight from the taps seems to harm them whereas cold water does not. The water supply comes through all-copper piping.

M. J. BROOMFIELD,  
Tiverton, Devon.

#### A Reader's Suggestions

THERE must be many regular readers of *The Aquarist* who possess some book of reference on tropical fishes, and many who wish their book could be better and more detailed. It occurs to me that *The Aquarist* could so easily help us all, merely by an extension of your present series "Tropical Fishkeepers' Refresher Course."

I suggest that an extra double page (i.e., four sides) be added to the magazine as a removable centre page, this to be printed more or less in the same way as the present form, except, of course, that we should then get details and photos of four fishes each month.

These pages would for the present form a "loose-leaf" collection capable of being bound if so desired. It might even be possible to print some of the less well-known fishes in colour. Obviously this idea would have to be considered very carefully, keeping each set of four fishes in the right groups, orders, families, etc., and consideration given to the numbering of the pages for eventual indexing.

I do not know just how this would affect the cost of the monthly issue, but I for one would not object to paying an extra copper or two each month when I know I am building up a valuable book of reference.

At the present rate of one fish per month a 400 pages book would take over 33 years to collect, by which time I suspect some of the pages would be so dog-eared as to be beyond binding!

For the initial stages I would suggest that the subjects chosen should be amongst the more uncommon fishes not covered by the cheaper books. What do other readers think?

Food for thought. Why doesn't some enterprising dealer sell sheets of thin, finely perforated Perspex? This would be so useful for filters, breeding traps and tank dividers.

G. F. SMALLRIDGE,  
Tankerton, Kent.

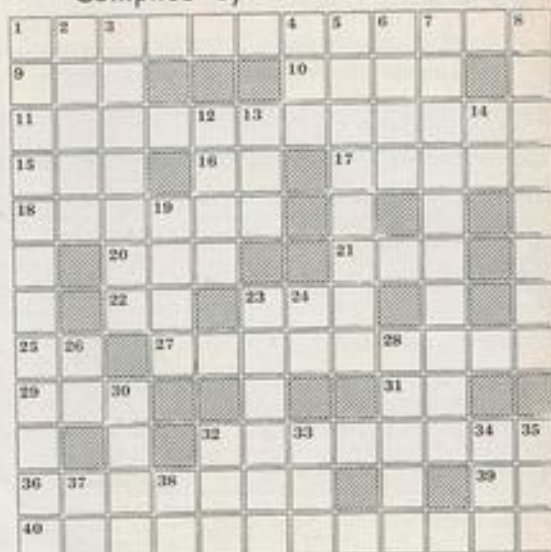
#### American Correspondent

I AM a third-year college student majoring in biology and with a great interest in aquarium fishes. I hope to do graduate work in ichthyology with an emphasis placed on aquarium fishes. Two phases that interest me are the study of behaviour and photographing fishes. I wish to correspond with young persons (between 18 and 25) who are interested in aquaria, particularly along scientific lines. I am hoping that your journal could help me contact someone in the described category.

KEITH ARNOLD,  
918 West Lovell Street,  
Kalamazoo, Michigan, U.S.A.

## The AQUARIST Crossword

Compiled by J. LAUGHLAND



#### CLUES ACROSS

1. Gus gets round Eli after *Barbus* (6, 6)
9. Ivan's better half? No, three-quarters (3)
10. Could be a fin, but was a Scot in *Kidsnapped* (4)
11. Alias gourami (12)
15. Alias bait-can, perhaps; or nasty egg returns (3)
16. Source of 13 Down (2)
17. Seahorse might be this for mermaid (5)
18. Fish or other creature lacking natural pigment (6)
20. Poetic effort of *Elodes* (3)
21. Whale (3)
22. Half the weed for us (2)
23. So might we describe the African jewel fish (3)
25. Junior officer cut short (1, 1)
27. Put a loose to be minus flower-leaf (9)
29. 100,000 rupees (3)
31. Can describe garments for big women, or the fish that got away (1, 1)
32. Lost toes for bony fishes (8)
36. Rich ape leads to *Epiplatys* variety (7)
39. Gasp from mid-pool (2)
40. A gem of a fish from the Dark Continent (7, 5)

#### CLUES DOWN

1. Siamese fighting fish (5, 7)
2. Perhaps an English girl, surely French Agell? (5)
3. Name of American trout introduced to British waters; iris (7)
4. Gosh-stopper used when unhooking pike (3)
5. A moss ale (anagram) (8)
6. A slip of gleaming fish-skin used as bait (4)
7. Innerbreed (10)
8. Aquarist eating these little fishes dares sin (8)
12. How to sharpen knife-fish? (4)
13. In emergency can provide a square meal for fry (3)
14. As 39 Across when gent gets out of more (2)
19. Ide is responsible for most of the notion (4)
23. Plural of genus (6)
24. And Latin in our pets' names (2)
26. Thanks for the answer (2)
28. Not caught (5)
30. A fish that could be arch in an odd way (4)
32. The crose left the detective mixed in concrete (3)
33. To give over before reaching end of line (3)
34. Tope loses its softness (3)
35. Brighter and greater portion of sole (3)
37. High frequency (1, 1)
38. Mixed type (2)

#### PICK YOUR ANSWER

1. 'Better are small fish than an empty . . .' The missing word in the proverb is: (a) bowl; (b) dish; (c) pan; (d) plate.
2. *Barbus filamentosus* was named by: (a) Cuvier and Valenciennes; (b) Day; (c) Regan; (d) Steindachner.
3. Unarmoured catfish with flat heads are referred to the family: (a) *Bunocephalidae*; (b) *Callichthyidae*; (c) *Doradidae*; (d) *Loricariidae*.
4. The silver-tip tetra is the popular name of: (a) *Hemigrammus crysoleucas*; (b) *H. nanaus*; (c) *H. pulcher*; (d) *H. ulreyi*.
5. *Mareula* is represented by about: (a) 30 species; (b) 40 species; (c) 50 species; (d) 60 species.
6. *Gambusia furcata* is indigenous to: (a) Brazil; (b) Cuba; (c) Florida; (d) Mexico.

(Solutions on page 22)

G. P. H.

# News

## from AQUARISTS' SOCIETIES

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

A TABLE Show for Novices was held at the meeting of the **Southend Aquarist Society**. The event was won by the club's youngest member, Howard Preston, who also took second and third places. The Annual Open Show will be held from the 6th to the 14th September at the new Exhibition Hall, Southend Pier. Every class will be an open class schedule and entry forms are available from Mr. G. Hedger, 67, South Avenue, Southend.

THE main item at the **Middleton and District Aquarist Society** meeting was a general discussion on tropical fish breeding in which the experienced members answered the questions of the newer and less experienced. The attendance was the smallest for some time due to the arctic conditions outside.

THE next meeting of the **Goldfish Society of Great Britain** will be held on Friday, the 2nd May, at the George Hotel, Hammersmith Broadway at 7.30 p.m. During the evening there will be talks on "Imperfect Fish" by Capt. L. C. Betts, M.B.E., and "Heads of the Basic Varieties" by R. J. Affleck. The table show will be for the Four New Varieties.

THE annual show of the **North Staffordshire Aquarist Society** will be held on the 5th, 6th and 7th June at the Charles Street School, Hanley, and full particulars may be obtained from the Secretary, Mr. L. J. Perks, 6, Radford Road, Cliffe Vale, Stoke-on-Trent. At the annual meeting held recently trophies were presented to Miss P. Richardson, winner in the tropical section, and Mr. K. Barker, winner of the coldwater competition. Meetings of the Society are held at the Bell and Bear, Shelton, Stoke-on-Trent, on the first Tuesday of each month, and new members can be assured of a warm welcome.

THE list of officers elected at the **Bedford and District Aquarist Society** annual meeting was as follows: Chairman, Mr. R. R. Meads; Vice-chairman, Mr. E. Gentle; Hon. Secretary, Mr. K. Joy; and Treasurer, Mr. G. Booth. Last year's Chairman, Mr. L. Georgeson, is now a Vice-President.

THE following members were elected for vacant posts at the annual meeting of the **Harrow Aquarists' Club**. Secretary, Mr. L. Capstick, 27, Anglemede Crescent, Pinner, Middlesex (Pinner 7525). Show-Secretary, Mr. R. Campion; Librarian, Mr. D. H. E. Freeman. Meetings are held on the first and third Mondays of each month in the Y.M.C.A., Gordon Road, Wealdstone, and visitors would be welcomed.

CLUB members are invited to visit the **Blackpool and Fylde Aquatic Society** when in that area. Meetings are held on the second and fourth Wednesdays in the month at the Veevers Arms, Cookson Street, and a pleasant evening is assured. February events included a Quiz, which was illustrated by means of an epidiascope, and also an auction. Arrangements are being made for the Annual Show in September.

RECENT events of the **Guildford and District Aquarists' Club** have included the Annual Meeting at which there was little change in the existing appointments. The new President is Mr. C. C. Patrick who is a Founder

Member of the Club. The March talk was by Mr. Aylott on "Breeding Egg Layers and Tropical Plants." The Secretary is Mrs. Doris A. Patrick, 98, Nightingale Road, Guildford. Phone 68002.

THE latest news from **Walthamstow and District Aquarists' Society** is that a Three Day Show is being organised this year on the 14th, 15th and 16th August. Schedules will be sent to Societies and all previous exhibitors. The Secretary is Mr. W. J. Chesneau, 44, Capworth Street, Leyton, E.10.

THE new Hon. General Secretary of the **Federation of Guppy Breeder's Societies** is Mr. B. Ashman, 19, Knighon Road, London Road, Romford, Essex. Mr. A. Holloway resigned the position through ill-health.

MALE swordtails and playis were on show at the second table show this year of **Guest Keen and Nettlefolds Pond and Aquarium Society**. The principal winner was Mr. L. Hyde and other awards went to Messrs. Fellows, Lane, Horne and McLeod.

ACTIVITIES of the **Dunstable and District Aquarists' Society** for March included a lecture by Mr. Russell Holland, the F.B.A.S. speaker, on barbs and also discussions on the Use of the Microscope and "How to Set Up a Furnished Aquarium." The Secretary is Mr. John Long, 12, Chester Avenue, Luton.



### The Aquarist's Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained at cost price by all readers of *The Aquarist*. The design is pictured here (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 2s. together with the **Aquarist's Badge Token** cut from page x, to **Aquarist's Badge, The Aquarist, The Butts, Half Acre, Brentford, Middlesex**, and please specify which type of fitting you require.

SEEDS of the giant water lily *Victoria Amazonica* were on view at the meeting of the **Carassius Club**. They had been sent to Mr. Mason who hopes to produce one of these specimens in his hot-house pool. The main topic of the evening was Twinstail Breeding and there were many and varied opinions on this controversial subject.

MEMBERS of the **Bradford and District Aquarists' Society** were recently entertained by an illustrated lecture given by Mr. C. Graham. The versatility of his knowledge of plant life he is also an aquarist, photographer, climber and naturalist. He is also the Treasurer of the Federation of Northern Aquarium Societies.

ARRANGEMENTS are being made by the **Riverside Aquarium Society** for visits to breeding establishments during the summer and those interested should contact the Secretary, Mr. T. Thewless, White Building, Barley Mow Passage, Chiswick, London, W.4. In a recent table show for cats and loaches a *Myxus tengara* won first place for Mr. A. Huxley, and among the future events are table shows for Guppies and Barbs.

A FILM show held recently by **Poole Aquarists Association** proved a great success. Among the films shown were "Spawning of Siamese Fighters" and "Spawning of Thick Lipped Gouramis." Both of these were in colour and every detail was shown clearly. Additional features were "Spawning of the Black Widow" and an underwater picture "Wonders of the Deep."

MEMBERS of the **Keynsham Aquarists Society** were guests of **Bath Aquarists Society** recently, and a quiz between the two societies resulted in a win for the visitors by 25 points to 20. A general discussion on a variety of subjects concluded an enjoyable evening.

A REQUEST has reached us from the hon. secretary of **Bristol Aquarists' Society** who would be pleased to hear from other secretaries on any subject relating to any aspect of the hobby. Mr. R. W. Savage, 36, Sevier Street, St. Werburghs, Bristol, 2, is the hon. secretary.

### NEW SOCIETY

AT a meeting held on the 4th March the **Orpington and Chislehurst Society** was formed. Meetings will be held on the first and third Thursdays of each month and the secretary is Mr. Peter Nash, 60, St. Pauls Wood Hill, Orpington, Kent. New members would be most welcome.

### Crossword Solution

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

PICK YOUR ANSWER (Solutions)

1 (B), 2 (A), 3 (A), 4 (B), 5 (A), 6 (A)

THE AQUARIST