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1955

Editorial

JUST about a year ago, we said, on this page, "to many people the rectangular frame aquarium (and more so its angle iron stand) is an ugly creation, an anachronism in a tastefully decorated and furnished room." There have been no great changes in aquarium design since then, but there are encouraging signs that, increasingly, thought is being given to the aquarium in relation to the home. On pages 140 and 141 of this issue we print photographs of some examples of what "the aquarium in the home" can mean to different people. These adjustments of aquarium to room design are the work of Mr. Philip Dee, who is a complete enthusiast for making the fishes fit in with the surroundings.

We would like to suggest that at all the large aquarium shows and exhibitions open to the public there should be one section set up as a living room corner scene. In this, amidst furnishings on loan from local stores in return for name display, an aquarium or aquaria should be set, built into a mock wall, incorporated into a cabinet, forming the major part of a dividing screen making an alcove in a lounge, or used in any way which blends with the surroundings or renders the tank an asset to the design. This would, we feel sure, attract many more home-lovers to fish-keeping, for there are people who want to be able to watch their fishes in comfort and who will not have a bare angle iron tank and stand (all that the dealer usually displays) in their lounge because it does not "fit." Again, we repeat the question we have asked before: "are aquarists' societies in their publicity ventures, and aquatic traders, paying sufficient attention to this question of the aquarium setting?"

Because we think the answer to this question is still "No," we invite readers to send in for publication descriptions and or photographs of the way in which they have used aquaria in their homes, or practical suggestions for ways in which aquaria can be attractively used; we will also be glad to learn of any exemplary installations seen by readers in their travels.



Photo :

Laurence E. Perkins

An article on aquarium decor in the home appears on page 140. Its author, Mr. Philip Dee, is seen here with one of his framed wall aquaria

October, 1955

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How to Culture Grindal Worms

A useful live food for fry between micro-worm and white worm feeding stages

by DR. F. N. GHADIALLY

Photographs by the author



A quantity of fine red sand and a non-rusting tin are the basic materials for a Grindal worm culture



This picture shows that the porridge used as food for the worms is of a creamy consistency. It is poured on the sand surface



Grindal worms from an old culture are shown being transferred to the sand around the porridge in a newly prepared tin

THIS easily cultured worm, approximately one quarter of an inch long, is suitable for feeding fry which have passed the micro worm stage but are yet too small to accept white worms. It was first isolated by Mrs. M. Grindal of Sweden from a culture of ordinary white worms, where it probably appeared either as a contaminant or a mutant form a few years ago. Since then pure cultures of these worms have been maintained by numerous aquarists. It is an extremely prolific breeder and with very little trouble quantities far in excess of the needs of any amateur fish breeder can be produced in quite small metal boxes.

The requirements for breeding this worm are very similar to those necessary for cultivating ordinary white worms, and as in a previous article (*The Aquarist*, July, 1955) these have already been discussed at some length, to avoid needless repetition only a brief account bringing out the salient points of difference between the cultivation of these two worms will be given here.

Most aquarists cultivate Grindal worms in small metal boxes varying in size from two-ounce rectangular tobacco tins to the "Oxo" box shown in the photographs. The latter is made of aluminium and is ideal for the purpose as it does not rust. A metal box is preferable to a wooden one as the medium has to be maintained in a far more humid state than that required for white worms. It will be remembered that a wooden box was recommended for white worms.

The medium commonly employed is either pure peat or a mixture of peat and sand exactly as that used for white worms, and the Grindal worms are fed on the same sort of diet, namely well cooked oat porridge. This method is used extensively and yields fairly good results but the collection of large quantities of pure worms from any but the most thriving cultures is difficult. The reason for this, I think, is that such a medium is rather too coarse-grained for our requirement; the small worms apparently get lost in the medium and unless sufficient worms are present to form fair-sized clumps, harvesting the culture is difficult.



After a few months a culture looks like this. The surface of the medium is covered with worms, which extend up the tin's sides

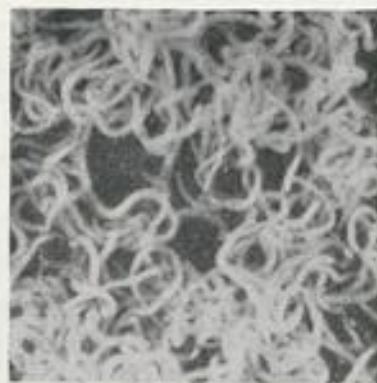
The method illustrated in the series of photographs accompanying this article shows how these worms can be made to grow as a thick sheet on the surface of a very fine grained medium, from which situation they can be very easily harvested in large numbers. This method in my hands has proved very satisfactory from all angles. The medium used is very fine red sandy soil; as a matter of fact it is almost pure red sand obtained from the weathering of sandstones.

Sufficient of this is placed in an "Oxo" tin to form a layer about 1½ inches deep. Water is now added to make the medium wet, but not so wet that water runs out when the box is tilted. A spoonful of fairly thin well-cooked porridge made from oats and water is then poured on the surface of the sand as shown in the photograph. The porridge should be of a creamy consistency so that it pours freely from the spoon yet not so thin as to allow it to seep through the layers of sand. Next a generous quantity of worms are placed on the surface of the medium just around the porridge. These have to be obtained in the first instance either from a dealer or a fellow aquarist; later on, of course, worms from old cultures may be used to seed new ones.

The amount of porridge placed on the medium must be proportionate to the number of worms available for starting the culture. It is better to put too little than too much to begin with, more being added as soon as the first lot is eaten up by the worms. Avoid "drowning" the worms when adding fresh lots of porridge in the early stages, but once the culture really gets going a spoonful of porridge should be poured on the culture every day or every other day, choosing as far as possible a different area each time. Keep the box closed with the lid and stand it in a warm place. These worms prefer a higher temperature than do white worms hence they do well in a heated fish house or when the box is stood on the cover glass of an aquarium.

If a fair number of worms have been used to start off a culture, in three to four days the entire surface of the sand will be covered with a thick sheet of worms. They will also begin to climb up the sides of the box in great numbers and by the end of a week you will have more worms than you know what to do with. At this stage cut down the feeding so as to produce just enough worms for your requirements. If this is not done they will get overcrowded and the whole lot will suddenly die one day and foul the culture. However, handled with reasonable care the box will go on producing worms for well over a year. It is best to have at least two boxes going, even though one box can produce more than you need, just in case something goes wrong with one of them.

The method of harvesting the worms is simplicity itself.



Grindal worms under the microscope



A close-up view of the worm "sheet" growing on the culture's surface

They can be scraped off the sides of the box or the surface of the sand with a razor blade or a knife. As the medium used is almost pure sand a small quantity of this introduced into the aquarium by such a procedure will not in any way upset life in the aquarium. The culture may be neglected for quite a while without serious consequences. Recently I did not feed a culture of these worms for a month and kept them in a room at a temperature of about 50°F. As soon as warmth was re-applied and feeding commenced they began to grow once more with unabated vigour.

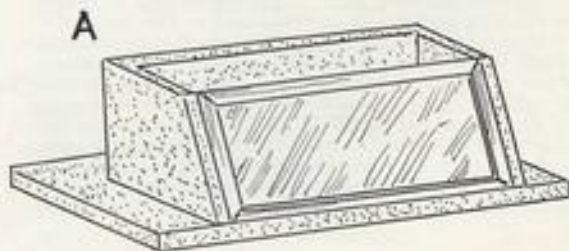
This, then, is perhaps the easiest live food culture to maintain and if for no other reason than this should find a place in the battery of live foods used to feed fish to-day. Finally, take care not to accidentally introduce Grindal worms in your white worm cultures. The former are such prolific breeders that they will crowd out the ordinary white worms from the culture.

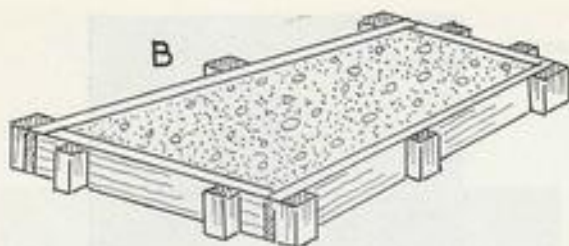
Garden Aquarium

by NICHOLAS BROWN

THE illustration at A shows a rather unusual garden tank that is largely of concrete construction. The tank as shown is not complete, for earth and small stones are piled against the sides so that the sloping glass front is actually set within a small rockery. To soften the rectangular outline at the top of the tank, artificial crazy paving is fitted round the edges. Similarly stones, mosses, etc., can be used to conceal the straight edges of the glass panel.

There will obviously be wide differences in area between the various sites on which it may be desired to build such a





Moulding the concrete base

tank. Although definite sizes are suggested below they need not be slavishly followed, though if the tank is of any size the thickness of the walls should not be reduced below two inches.

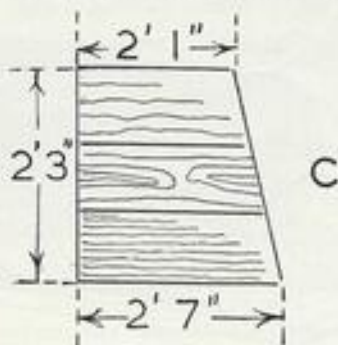
The work should be started on the base, which extends for about one foot beyond the side and back walls. The site is dug out to a depth of about six inches, and the earth rammed flat. A two-inch layer of small stones is then spread over the site and these also are well rammed in.

The Moulds

Wood of 4 ins. by 1 in. section is used for the sides of the mould. Four boards are stood on edge to outline an area of 7 ft. by 4 ft., and are nailed to stout pickets on the outer faces of the boards, as indicated on drawing B. The inside of these boards is lightly oiled or given a thick coat of whitewash, and the mould filled with a well rammed, 3:2:1 concrete mixture. The top of the base can be levelled off by drawing a straight edged plank across the top of the wet concrete. There is no reason why the frame of the tank should not be of brickwork, faced on the inside with waterproof cement. The easier method of construction will be to cast the sides in concrete, and the moulds for these can be prepared while the base is hardening.

Wood of one inch thickness should again be used for the moulds. The back is 5 ft. long by 2 ft. 3 ins. high, while the sides are 2 ft. 7 ins. long on the bottom edge, 2 ft. 1 in. on the top edge, and 2 ft. 3 ins. high, as illustrated at C. The sides are nailed on to the ends of the back, sloping edges of the side to the front (see D). Three extra, similar moulds are prepared, but with these the back is four inches and the sides two inches shorter than the dimensions previously given, so that when the smaller mould is stood inside the larger there will be a space of two inches between their inside faces.

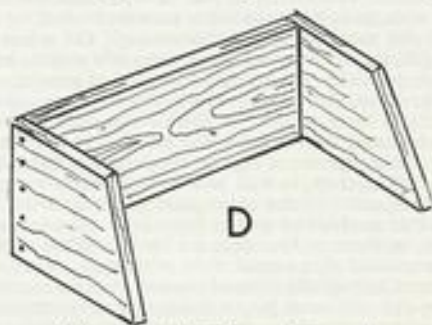
It will not be possible to fasten these moulds to pickets as the latter cannot be driven into the base. It will therefore be necessary to stand these moulds in the appropriate position and to put bricks or heavy objects against them to hold them in place while the concrete is poured. The



insides of these moulds should be oiled or whitewashed as before.

At the positions where the bottoms of the walls will rest on the base, the latter should be roughened with a pick to give a better key for the concrete. However, a stronger job can be made by reinforcing the walls to the base, which may be done in one of two ways. In the first, the position of the walls must be marked on the base while the concrete is still wet, and along their centre lines some metal rods of $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter are pushed into the still wet concrete so that they will project eight inches or more. As the concrete sets these rods will be fixed firmly in place, and give additional strength when the walls are poured in place round them. Alternatively, if the concrete on the base is allowed to set, holes can be chipped in it, the rods stood in the holes, and some cement poured in round them to hold them firm.

When the concrete for the walls is poured it must be well rammed and levelled off flush with the top edges of the mould. Ample time must be allowed for hardening before the moulds are removed, when the work should be covered with damp sacking until it has thoroughly dried. The time necessary between pouring of the concrete and removal of the mould will depend on the type of cement used; some



Sides and back of the wooden mould

indication of the period will often be printed on the cement sack.

The glass is held in a frame of 2 ins. by 1 in. wood that has a $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. deep slot sawn out of the inside edges to take the glass. The four pieces of wood are cut to length, and are sawn across their ends at an angle of 45° so that they fit together like a picture frame. They are held together by "corrugated fasteners" across the inside of the joints, there being two fasteners to each joint.

Boring Concrete

A special bit for boring holes in concrete can be bought quite cheaply, and with the aid of this holes are bored on the inside of the sloping fronts of the sides and in the base, the holes are plugged with small pieces of wood, and the frame secured by driving screws through its edges into the plugs. Before the frame is glazed, it must be given two coats of bituminous paint. Either plate glass or two thicknesses of thinner glass should be used for the panel.

Earth is piled against the sides and back of the tank. It is brought up level with the top of the tank for about one foot all round back and sides, and then slopes down gradually to ordinary garden level. Suitable rockwork and plants should be put on the sloping earth, while imitation crazy paving is laid on the level areas. The paving is made by making one inch thick cement slabs in shallow boxes, and scoring the crazing marks in the wet cement with a trowel.

The usual routine precautions with concrete tanks should be put into effect before coldwater fishes are introduced into the finished aquarium.

Blue Acara

(*Aequidens latifrons*)

ORDER:—Percomorphi, from Greek *perke*—perch, and Greek *morphe*—shape.

FAMILY:—Cichlidae, from Greek *kichle*—a kind of sea-fish.

SPECIES:—*Aequidens latifrons*, from Latin *aequalis*—similar or equal, Latin *dens*—tooth, and Latin *latus*—broad, and Latin *frons*—brow, or forehead.

A NATIVE of Panama and Colombia, this fish is one of the larger cichlids, growing up to six inches in length. Because of its size, lovers of "toy" tropicals may be tempted to ignore it.

This is a mistake, for its interesting habits and great beauty, coupled with its comparatively mild disposition, entitles it to a place in any collection of fishes, not as an inmate of a community aquarium, but in a fair-sized home of its own—say a 36 ins. by 15 ins. by 15 ins. tank. Small specimens may be kept for a time in a mixed collection, but careful watch should be kept in case they indulge their cannibal instincts. Lack of live food and cramped quarters are most likely to foster this cannibal tendency.

Even quite small specimens exhibit a decided metallic blue, although in some lights this might be reflected as green. Actually, close examination will show that the large scales have two different colour patterns. Those on the upper few rows have blue centres, outlined with greenish-brown, while the lower rows have greenish-brown centres outlined in blue.

The blue-green markings extend into the fins, overlaying the normal orange tint which is their basic colour. The body shape and colouring of both sexes are identical, except when the female is swollen with eggs, but the branched rays in the dorsal fin of the male, when mature, are elongated into a point at their upper extremities.

Live food is always preferable for blue acaras. A well grown specimen can tackle and swallow a five-inch worm without much difficulty and be ready for another in an hour or two. Small wonder then that they are almost always hungry when fed upon *Daphnia* and other small live foods. From almost the first day they will be constantly on the watch for your approach, and can easily be trained to take tidbits from your fingers. For aquarists pestered by large numbers of cyprids in their tanks, an acara or two is ideal. They will polish off every one of these tiny crustaceans, whose shells are too hard for the average fish to crush. What they will *not* do, however, is to eat cyprid eggs which have been laid in the tank. These will in time give rise to further batches of the little demons, providing more meals for the ravenous cichlids.

Acaras will tolerate temperature in the high sixties without suffering, but if breeding is contemplated, heat the water to around 76°-82°F. It can even be higher by several degrees before the fishes show signs of distress. I have kept them at 90°F. and over by accident until I discovered that my thermostat had jammed.

If several fishes are kept together males will fight bitterly unless there are enough females to engage their attention. They will then occupy themselves with trials of strength with the females in an endeavour to find a suitable mate. The rejected female of one fish might easily be an even match of a weaker male and thus find a mate after all. For several days the fishes will sort themselves out, locking lips together and dragging each other backwards and forwards



Male blue acara (one-third natural size)

in the tank—indulging in horseplay, mock battle, and fierce embraces.

Once a couple decide to spawn they begin to scoop holes in the sand, picking it up in their mouths and spitting it out in a different spot, or fanning it vigorously with pectoral and caudal fins. It is wise to remove any other fishes from the aquarium, leaving a single pair in sole possession. They do sometimes spawn with other fishes in the aquarium, but they are more nervous and irritable on such occasions, and may be tempted to eat their eggs.

Both fishes will busy themselves cleaning rocks in preparation for the reception of eggs, and it is now that small ovipositors begin to make their appearance at the vents of the fishes. Soon egg-laying begins. The female passes the eggs through her ovipositor on to the scrupulously clean rock surface, and the male follows to fertilise them. They are adhesive and remain firmly attached to the rock surface. Care is taken to ensure that they are laid in rows, and not heaped one on top of the other.

The infertile eggs are usually removed by the parents after spawning is complete, and then they mount guard, zealously shielding their eggs from all enemies—both real and imagined. A continuous current of water is made to flow over the eggs by vigorous fanning with the fins. This ensures that any sediment which might otherwise settle on them is briskly washed away, and no doubt also serves to partly aerate the stagnant water.

About four or five days after hatching, the eggs burst and the fry emerge. At this time the parents are always present, gathering the fry into their mouths and carefully depositing them in a previously prepared hollow in the compost, where they are so crowded together that they look like simmering jelly. They have just about settled in their nursery when the parents snatch them out of it and place them in another. This changing goes on every two or three hours for several days. At this time the fry are free-swimming and rise in clouds about their parents' heads. As there may be as many as two thousand they make quite a showing. At night the young will gather together at the bottom and their ever-watchful parents hover above them, tireless in their efforts to raise their huge family.

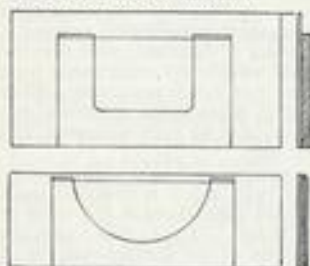
Feeding will undoubtedly be the biggest problem and unless unlimited supplies of food are available it is best to concentrate on raising a few really good fish. Starting with the smallest of live foods, increase the size to suit the growth of the youngsters. With adequate supplies this will be rapid—in fact, they should be at least an inch long when seven weeks old. As soon as practicable start feeding earthworm—at first grated, then chopped small, and finally whole. There seems to be no finer food for the little acaras than this. Even in England, however, it is difficult to find

(Continued overpage)

Microscopy for the Aquarist—13 by C. E. C. COLE

LAST month I mentioned the four inch objectives made by Messrs. Watson and Baker and emphasised their usefulness in enabling us to obtain an overall, magnified conception of the shape of many of the larger aquatic organisms. But this is not the only use to which the objectives can be put.

Messrs. Flatters and Garnett market two glass troughs (see illustration), selling at between two and three shillings each, in which creatures such as *Daphnia*, *Cyclops*, *Gammarus*, *Asellus*, small water beetle larvae, gnat larvae, etc., can be observed in a magnified image going about the ordinary business of life in a perfectly natural manner, blissfully unaware of prying eyes. Providing water lost by evaporation is replaced they can live for days. With an object glass such as the 4 in., the actions of quite a number can be watched at the same time, and moving the trough is reduced to a minimum.



Frontal and end views of two useful troughs made by Messrs. Flatters and Garnett. Aquatic organisms will live in these for several days and can readily be examined with the microscope.

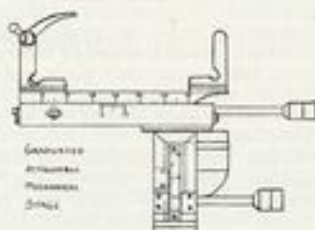
For the best results the trough must be vertical and not horizontal, so that the body tube of the microscope must be parallel to the surface of the table. This is easily achieved with those microscopes with a hinged joint, but is practically impossible with fixed-angle models. Looking through a horizontal body tube, however, is extremely uncomfortable unless the instrument is placed upon a stout box to bring the tube to eye-level.

A great deal can be learned of the habits of small creatures in this way, and hours will slip by unnoticed while you watch enthralled. Many a time have I let food get cold while I have waited for the hatching of, say, a gnat raft, or the change from larvae to pupa of creatures I have previously watched hatch from an egg.

With such an objective there is a slight reduction in the primary image of the actual size of the creatures being observed. A $\times 5$ eyepiece will magnify the image to approximately three and a half times the size of the original organism. Use of the $\times 10$ eyepiece will double the magnification, but reduce the size of the field of view. We therefore have a degree of control over the size of image without changing the object glass. Should this be desired it must be remembered that the 4 in. objective is screwed into the base of the draw tube, and must be removed before another object glass is swivelled into position at the nose-piece of the body-tube.

If in a hurry, and your instrument is one in which the draw tube can be slipped right out of the body-tube, do just this and slip back the eyepiece into the top of the body-tube. Usually this is not worth while. In fact, "hasten slowly" is an excellent piece of advice for budding microscopists to adopt in every branch of the science.

Increased magnification not only reduces the size of field, the depth of focus, and intensity of light (from any fixed source), but seems to increase the speed with which objects move across the field. There is a simple explanation of this. A movement of one-eighth of an inch in a field of



one inch is comparatively small, but in a field which is only one-eighth of an inch itself is from one extremity to the opposite extremity.

Thus to our technique of operation must be added extremely slow and smooth movement of glass cell or slip upon the stage. The gadget described in part 10 of this series is the cheapest and the best way to obtain control if no mechanical stage is available.

Nevertheless some of you whose enthusiasm has been sufficiently aroused will wish to know more about so-called mechanical stages, with a view to obtaining one when funds permit. There is, of course, no doubt that they are extremely useful when any serious study of really microscopic objects is undertaken, and will last several lifetimes if properly treated.

All reliable manufacturers produce one or more models. In their simplest form they consist of a device to hold a glass slip gently but firmly. By an arrangement of racks and pinions the slip holder can be moved either east to west, north to south, and vice versa, at a speed regulated by the fingers turning a wheel. Under no circumstances can they be operated speedily.

A costlier model is equipped with a vertical and horizontal scale, and these are particularly useful if one wishes to examine a particular spot on a prepared microscope slide. With the object in the dead centre of the field of view the readings on both vertical and horizontal scales are noted. At any time afterwards a further examination of the same spot can be ensured by replacing the slide on the stage, and moving the mechanical stage until the readings are exactly the same as previously recorded. It must be remembered, however, to note also whether the slide was being examined with name label on the left or right of the stage. Simple— isn't it?

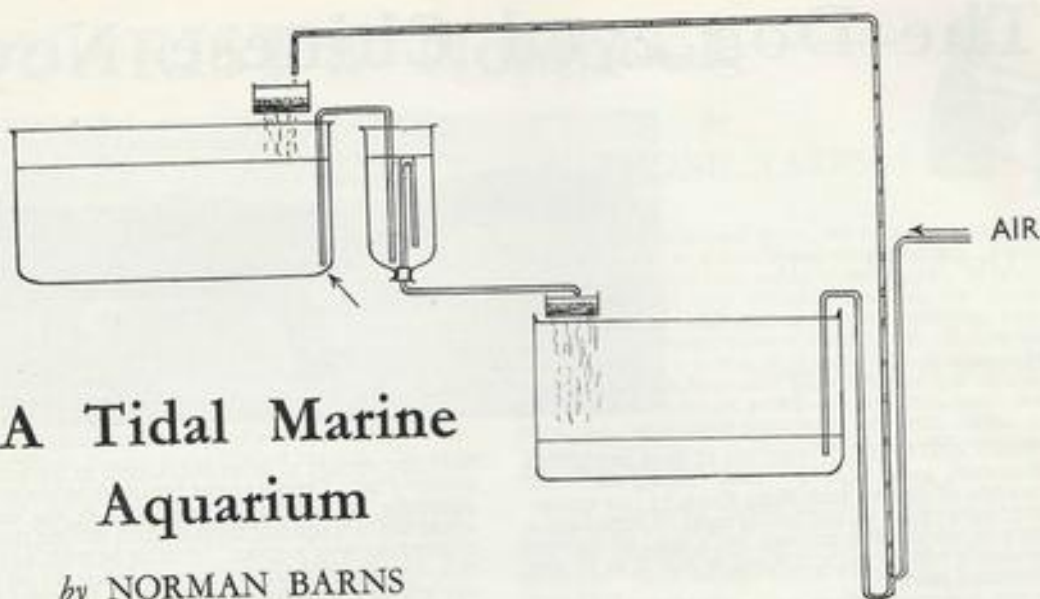
Mechanical stages cost from £11 to £18 each. However desirable for advanced work, which we shall eventually reach, they are not a necessity at the stage at which we have at present arrived.

Blue Acara

(Continued from preceding page)

sufficient worms during the summer months, so recourse should be had to a "wormery."

This is a place where conditions are favourable for the breeding of worms. Moist loamy soil is desirable. If a pit is dug and filled with soil of this nature it can be kept moistened by emptying tea leaves on to it, and covering with a tarpaulin or other waterproof material. During a prolonged dry spell washing up water can be added to it. In such a spot worms will congregate and are easily found by turning the soil over with a fork. Often this is not necessary, for the worms come up and frequently stay just beneath the cover—waiting for you to find them.



A Tidal Marine Aquarium

by NORMAN BARNES

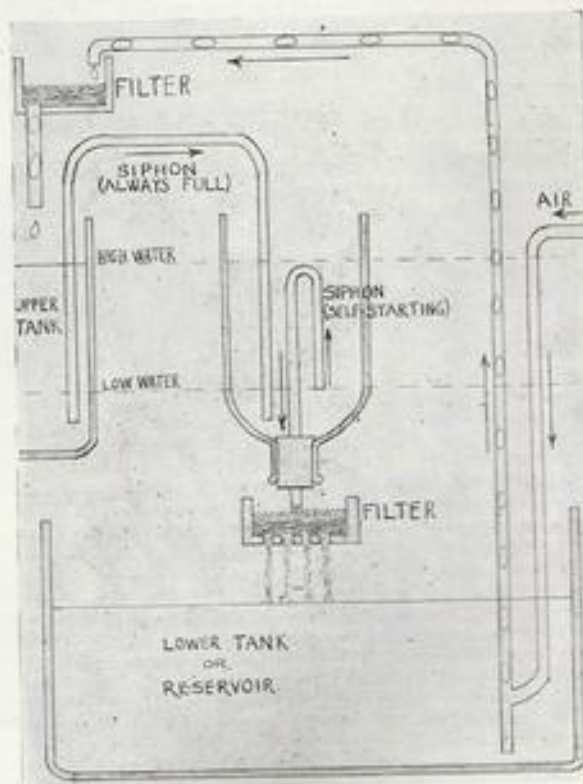
HOW often do those of us who keep marine aquaria look with dismay at the periwinkles high and dry and the opelet anemone half out of the water, waiting for the tide which never comes? Especially after the summer holiday by the sea do we wish we could convert our tank to a tidal one, and yet so often the books tell us to drill a hole in the side of the tank almost at the bottom, a task difficult in itself, and one which produces a far from ideal arrangement owing to risks of leaking, and of clogging which may be difficult to clear.

It is, however, a quite easy matter to convert your present aerator system into a combined aerating and tidal apparatus. You can do it by means of a separate automatic siphon which you mount by the side of your tank. Such an arrangement is also known as a Tantalus cup, and you make it in this way: first get a glass bottle, not smaller than one pint capacity, and cut off the bottom. To do this make a line all round the bottle where you want the cut to be made, then score it deeply all along this line with a triangular file, using a little turpentine as a lubricant. Next, lay strips of wet blotting paper all round above and below the scored line. Hold the bottle horizontally and apply a tiny flame, such as that from a match, to the mark. A crack will run along the line, so turn the bottle and follow the crack until it has travelled right round, when the bottom will drop off. The sharp edges can easily be smoothed with a file.

As for the tubing, this can be of glass, rubber or plastic, and must be bent according to the dimensions of your particular lay-out. If you are unable to bend glass tubing yourself, yet would like to use this material, you can probably find a schoolmaster or chemist friend who would do it for you. The accompanying drawings are self-explanatory, the important part being the arrangement of the levels of tanks and automatic siphon. The mounting of the siphon is also a matter of personal choice; only make sure you can easily remove it from its mounting. The boring of the stopper in the bottom of the siphon is a job best done expertly, but you can do it yourself, using a red-hot meat skewer, and then sealing it with pitch.

In the drawings I have shown the apparatus set up to work two tanks, but of course the lower one could be

(Continued overpage)



General arrangement of the tidal apparatus is shown in the top diagram (arrow at the left indicates danger spot through clogging). When the lower reservoir is shallow the air lift is made as in the top figure

The Dog-eyed Chinese Newt

by

Dr. E. ELKAN

Photographs by the author



SYNOPSIS *CHINENSIS* is not one of those amphibians frequently found in dealers' lists. Seeing that it has to come all the way from Hong Kong, its rare appearance need not surprise us, and having made its acquaintance we may even wonder why anybody but a dyed-in-the-wool newt specialist bothers to catch it and to send it on its long and hazardous journey.

The two specimens I have under observation are 5 ins. (127 mm.) long from snout to tip of tail. This is large for a newt. They are chocolate coloured on the back and sides, black with bright orange-red spots underneath. Their eyes well justify their name, they look very much like the eyes of a dog. As companions in one and the same aquararium my two specimens seem to be extremely badly suited. From the day when I first received them, one



head just enough to bring the nostrils to the surface for a breath of air. On one or two occasions he has shown some enterprise by climbing up the glass in the only corner where this was possible because there was the thermometer to give him extra support. Finding he could go no further than the top rim of the tank he stayed there for the rest of the day and then returned to the water. He never made any attempt to leave the water by the "shore" which, one would have thought, would have been much easier than to climb up the glass.

I have not been able, so far, to determine the sex of the two specimens. According to the literature available the two sexes look too much alike to allow for a reliable diagnosis. If they are still alive next spring their behaviour at that time may throw some light on this question. The dog-eyed newt seems to be common on the north-east coast of China. It was first described by Dr. J. E. Gray in the *Proceedings of the Zoological Society of London* (1859), where an excellent drawing of the animal can also be found.

If other herpetologists keep this newt, it would be most interesting to hear how their animals behave so far from home.

Side and ventral views of the dog-eyed Chinese newt are shown on this page

decided to take its abode on land, the other in the water, and as far as I know, they never meet. To understand these opposites in behaviour one would like to know the age of the two newts and their rules of behaviour in the swamps of China. Many newts have aquatic and terrestrial phases in their lives, but it is surprising to see two of equal size, imported in the same batch, behave in such opposite ways.

Their feeding habits too are by no means alike. The land-type, who spends all the time sitting under a piece of bark, has a good appetite. Every second or third day I can lift him out from underneath the "cave" by the tail, put him on even ground and offer him an earthworm. Being lifted up by the tail does not worry him in the least. He swallows even a medium-sized earthworm at once.

His aquatic companion seems to be on a slimming diet. If I can make him accept a small earthworm once a fortnight I am lucky. His "pond" is full of *Daphnia*, yet I have never seen him eat one. He holds himself completely submerged, making little movements with his jaw as if he was "chewing" water, and every 10 to 15 minutes he lifts up his

A Tidal Marine Aquarium

(Continued from preceding page)

nothing more than a reservoir if desired. If this lower tank is shallow the tubing is best arranged as shown in the small-scale drawing so as to make sure there is a good lift. The speed of flow can easily be controlled by a constriction on the siphon tube, but make sure that nowhere in the apparatus is there any metal part coming into contact with the sea water.

One last word of warning. Be careful to see that the inlet of the outflow pipe in the upper tank does not become clogged or the tank will continue to fill. Shellfish and other inhabitants of the tank are apt to crawl over the opening and block it, therefore it is a good idea to have several openings, (such as a rubber bulb with a number of holes in it could provide).

AQUARIST'S Notebook



by
RAYMOND YATES

OCCASIONALLY I meet hobbyists who introduce themselves with a remark such as "I am a coldwater enthusiast." This conjures up scenes of early morning dips in the Serpentine. In any event it usually leaves me cold. It is true that from time to time one meets a real coldwater enthusiast in the hobby but what the majority mean is that they are goldfish fans and nothing else. I have nothing against the goldfish but it is only one section, even if a large one, of the coldwater side of our hobby.

Frankly, I feel sorry for these fanciers who have never ventured beyond the goldfish in the realm of coldwater fish keeping. Some time ago I was asked if I would give a lecture on the subject by a certain club, and they told me subsequently that until then they had drawn a blank, as all other lecturers had remarked that "nobody could talk for more than ten minutes on the topic," or words to that effect. One reason why so few enjoy the thrill of keeping coldwater aquarium fishes is that they are put off by seeing enormous specimens of these fish in the various public aquaria. Large fishes are easy to keep in such establishments but, generally speaking, large fishes lose most of their grace and charm. For the coldwater aquarium fishes should not exceed six inches in length and preferably half that size.

A fairly large tank is best, four feet long is just about right. In this can be kept a selection on community lines of carp, goldfish, rudd, golden rudd, golden orfe, silver orfe, sunfish and small bass, American dogfish, bleak, tench and golden tench and very small perch. You have here fish for the surface area, centre and bottom of the tank. The sunfish, bass and perch will get on quite well with the other fish if the latter are larger than they are themselves. Such a list enables one to choose some good colour schemes apart from the goldfish. Orfe are very colourful as also are rudd, darker tones being provided by carp and tench. The dogfish are most amusing and get their name from the dog-paddle effect of their pectoral fins, rather like some members of the warm water lyretails, in particular the motions of blue gularis.

Small minnows do well in an aquarium but prefer aeration. Bullheads and sticklebacks are interesting but unwise bedfellows and the gudgeon is capable of disturbing the mulm to the despair of the aquarist. Roach are impossible. They are very prone to a number of diseases and although I have made many efforts to keep small specimens (down to less than one inch in length) they fall prey to disease in less than no time. Bream also are very difficult. Young dace need running water and chub when small are of little attraction. Loach can be found under stones in mountain streams but require shallow water, well aerated. Keeping them in 15 inch-deep tanks is hopeless. Ruffe are unattractive but offer no difficulty if live food is offered. Perch are often said to be hard to keep but this is far from true. They must have plenty of live food and cold water—perch cannot stand water temperatures much over 50°F.

The main difficulties with coldwater fishes are keeping the temperature down in summer, keeping the tank water sparkling clear, and feeding. The last is probably the worst headache of all. Dried foods and *Daphnia*, *Tubifex*, white worm, etc. are useless. They require much more bulk than these offer. This means chopped garden worms, insects and flies, maggots, minced meat, fish and cereals if they are to remain healthy, bright and alert. Some fishes are lightning quick, such as orfe, whereas dogfish hover over food and contemplate it for two or three minutes before even attempting to sample it. Plants also are a difficulty as they need light, and artificial light produces unwanted heat. In winter they die down anyway and a large tank without plant life looks drab however fine the rockwork.

One or two coldwater fishes can be kept at higher temperatures such as goldfish and bitterling but if you are having a coldwater tank set-up keep it cold. It is wise to begin with only two varieties such as, for instance—shubunkins and rudd, golden orfe and bitterling, carp and golden tench, mixed types of sunfish, etc. Before buying coldwater fishes it is wise to look for signs of disease, frayed or fungused tails, imperfect shaped fish or fish with hollow bellies (often found in young orfe in spring) and the fish louse, this latter more commonly met with on the slower bottom feeders such as tench and carp. Why not try out that spare tank as a coldwater set-up?

Some interesting points on the cultivation of *Cryptocoryne* were discussed at a recent meeting of the Nottingham and District Aquarists' Society and as these will be of major interest to aquarists in a wider field, a summary is given here.

In the first place it must be appreciated that there are a great many species of this plant, far more than the eight varieties most commonly known, and this may account for some of the difficulties experienced by fanciers. *C. Griffithii* seldom prospers unless planted in a more nourishing medium than tank compost. Clay and peat had been tried but a reliable one was a mixture of equal parts of granulated peat, clean loam and sharp sand to which a little bone meal had been added together with very small quantities of dried blood or sulphate of ammonia. This plant prefers a dimly lit situation. If leaves are not a deep rich green reduce the amount of light falling on the plant. Good specimens reach ten inches in height and it flowers occasionally. When a bud appears the water level should be reduced to two-thirds the height of the plant. It multiplies if undisturbed, by short runners from the rhizome.

C. cordata reaches 12 inches and *C. Mullerti* 15 to 18 inches in height. Apart from size these plants look alike and both will stand slightly more light than *Griffithii*. Additional feeding is better than relying on the compost. Clay pellets containing bone meal, dried blood and sulphate of ammonia hardened by baking in a slow oven are useful. *C. Willini* is a little easier than *cordata*. It benefits from additional feeding but remains small if overcrowded. It needs more light than *cordata*. *C. Nevelli* and *Beckettii* are much easier than the previous species. The former will reach seven inches and the latter four inches at most although both multiply much more rapidly than the other species. *C. Hartiana* is a fairly new but first class plant reaching 14 inches with leaves two inches wide. It has less stalk and more leaf than the other large "cryptos" and needs no feeding. Too much light dwarfs it and makes the leaves a much lighter green. Generally speaking all the leaves of cryptos are long lived and suffer from sediment or algae thereon. They prefer fairly soft, acid water and dislike sudden changes in pH, even more so than fish. They also object to being disturbed too often, growth being put back three months whilst the roots take fresh hold. These plants are attacked by a bacterial growth which appears as a white patch in the leaf which rots away. Cut off affected leaves and treat tank with acriflavine, giving only a mild dose.

The rarer and more unusual fish are not often seen in the

shops of dealers because they are snapped up almost as soon as they are offered for sale. The demand for these fish is generally greater than the supply so the keen aquarist will buy them as soon as he sees them on sale. It is a great mistake to think because one dealer has them that everybody else will, and that the price may prove cheaper elsewhere. With rare fish this just does not apply. You will look elsewhere and fail to find any, and when you return to the original dealer you will find he has sold out of the fish which took your eye. In life most of us think too often and too long about things with the result that we often go without what we really need. Much the same applies to fish. Snap up those rare specimens, opportunity does not knock twice.

Those aquarists who are swimmers know much more of what life is like under the surface than their land-lubber brothers. They have every opportunity to test and try out any pet theories they may have. If you have ever wondered how a shark feels when you shout at it under water try if yourself—the noise is deafening. The limitations of sight are also interesting, particularly looking upwards at the surface. With a mask, clear vision is obtained merely because there is an air space between the eyes and the water. This has the disadvantage of making everything look larger, about a third bigger than is actually the case. Underwater swimming is certainly now very much in vogue, even by those who never go near the sea, and a visit to the local swimming bath will show you more goggles and swim-fins than you ever thought existed.

Reading books on how to swim gives some help but does not assist those who want to engage in underwater work. To overcome this a book has recently been published which explains in simple language all the details of this new art. It is written for the absolute beginner, those who have never even seen underwater equipment. In the course of 80 pages details are given of the various items of equipment and their uses with many useful tips from practical experience. There is a chapter on the technique of hunting, another on fish, real and imaginary risks, advanced equipment and details of the costs involved. Reference is made to underwater swimming clubs, coastal regulations and, in fact, just about everything the novice needs to know. There are 18 photographs and seven line drawings. Aquarists interested in this new international sport will find this book instructive reading. It is entitled *Guide to Underwater Hunting* by Simon Codrington, and is published by Adlard Coles Ltd., at 7s. 6d.

It is comforting to report continued and increased interest in the aquarium at the London Zoo in Regent's Park. During 1954 the number of visitors to the aquarium was 378,196, an increase of 31,396 over the previous year, in spite of the shocking weather throughout the summer period. Even so, only one person in every six who visits the Zoo also visits the aquarium and this must be due to the fact that visitors have to pay a separate admission charge to the aquarium. Running public aquaria is quite a costly business and that is why a further charge is made. In 1954 the cost of running the aquarium rose by over one thousand pounds to £8,697, but the income from admission charges also increased to £13,894, leaving a comfortable balance.

Three books on fishes were presented to the Zoological library during the year and five dealing with reptiles and amphibians. For once in a way quite a large number of fish were donated to the collection, these including 100 harlequins, 10 mudskippers, 29 cichlids, six angels, 10 kissing gouramies, three clown loach, 22 red-spotted gobies, four fresh-water gobies, seven golden coral and one scarlet coral fish, one black shark (*Labeo*), 13 northern char, two bitterling, one orfe, 1 tench, one blenny, four *Pelmatochromis kribensis*, 10 young salmon and, last but not least, four black moors from Sir Winston Churchill. In addition,

the Hungarian Government provided three sterlets from behind the iron curtain. Ten varieties of fish new to the Regent's Park collection were added during the year.

Among the gobies only two are popular for the tropical freshwater tank, these being the wasp goby or bumble bee fish and the purple-striped gudgeon (*Mogurnda mogurnda*). Both are easy to keep if provided with a carnivorous diet. They are quiet fish and rest for long periods and give the impression of being tired out. Both have bad reputations for fin-biting and for this reason are not popular for community tanks. If well fed, however, wasp gobies are little trouble and the other fish in their tank soon learn to take avoiding action when the goby comes ambling up behind them. *Mogurnda* in aquarium literature is made out to be the worst biter of all but this is not strictly true. You will have trouble if you put them in a community tank with small fish but if they are kept with really large fish they completely reform and become model members of the tank. They are not easily frightened although they are very alert when in company with large cichlids and, in fact, the only fish which seem to really awaken their sense of danger are large-mouthed fishes such as blue gularis. The term "purple-striped gudgeon" is misleading as the fish is not too brilliantly coloured, and bears no resemblance to the common gudgeon of our English ponds and canals, but is much more like the American dogfish, so popular in cold-water tanks a few years ago. The eye of *Mogurnda* is blue, rimmed with black, and from time to time looks somewhat opaque, rather like the eyes of discus fish in certain lights. The aquarist may think his specimens have died, jumped out or been eaten by other fish if he cannot find them but actually they enjoy resting in the middle of thick clumps of plants and, by keeping perfectly still, are not easily seen. I can recommend these fish to hobbyists who will keep them only with much larger species.

The editors of club magazines all have a perpetual headache. I refer to the difficulty in getting suitable "copy" from their members. Nor is this trouble confined to clubs in Britain, as I have found numerous references to it in overseas magazines. The editor of a magazine issued by a Midland club wrote to me some time ago on this aspect and mentioned that although the club had almost 60 members only eight had bothered to provide him with any material for the magazine in the last 18 months. Of these eight four had submitted only one article. This editor suggested that it would be a good idea if a central pool could be formed and all used material sent there for issue to other club magazines. I agree that this would be helpful and if any club editors have any views on this I shall be pleased to hear from them. It must be remembered however, that many clubs interchange their magazines with others, even with clubs abroad, and this tends to defeat the object of having a central pool. Then again, the essence of a club magazine is that it is local and that the articles are written by people you know personally or by aquarists of national standing. A club magazine, however small, should have news and views about the activities of the club, one or two articles of fishy aspects, and some form of advertisement section for dealers, or members with equipment or fish for disposal. Most magazines I see are very well done but one or two could improve their attractiveness by making sure the type on their typewriter is really clean. Nothing is worse than blobs of dirt which are supposed to represent an a, e, o or u.

It is reported that a prisoner at Salisbury Gaol, South Africa, has made quite a good thing for himself out of the profits on the sale of goldfish bred in a pond in the prison grounds. This just goes to prove the truth of the old saying that where there's a will there's a way.

In the Water Garden in OCTOBER by Astilbes

TOWARDS the end of October we are likely to experience a fairly severe frost. The 28th of the month is about the usual time and rarely does a year pass without this happening. It may be fairly mild after this until the end of the year, but the early frost generally comes to blacken most of the above water leaves. It is better to remove as many of these dead leaves as possible, as not only will the appearance of the pond be improved but the water will remain purer than if many decaying leaves are allowed to remain. It is doubtful if the frost will be severe enough to cause the water to freeze over, at least this is unlikely in the south of England. Once the pond does freeze over there is plenty which can be done to improve matters.

The question as to whether pond ice should be broken or not is often asked and I consider that at least one part of a pond should be kept free of ice. Where there are fishes in the garden pond it is essential to open the ice not only to allow fresh air to get to the pond but to allow the foul gases to escape. Many people do not realise what is taking place under the ice on a pond. In consequence much harm can be caused by lack of care and thought on the part of the pondkeeper. The first and fairly obvious happening when a pond freezes over is that there is considerable expansion and great pressure is exerted by the ice. This force is sufficient to crack ponds which are not very well made, especially if no reinforcement was added when concreting. Never hit the ice to break it as this can harm life in the water. An easy method of making a hole is to place a water-can filled with boiling water on the ice and leave it for a time. A clean round hole will soon be formed and the handle and spout of the can will prevent it from falling further into the pond.

A fine chisel can be used as a form of stiletto to gently prick through the ice and make a channel all round the pond, if necessary. Some pondkeepers slightly lower the level of the water once a hole has been made as they find that the water does not freeze up under the ice cover and the air space beneath the ice allows a circulation of fresh air to the benefit of the inhabitants. This plan works

fairly well as long as there is not another very severe frost for this will only freeze over the surface again under existing ice cover. If the ice is left unbroken on the pond it is possible that the water beneath can become very foul. Any gases which form at the bottom of the pond through decaying vegetation are unable to escape and so the water loses its freshness and clear colour. If the frost lasts a week or two the water may get so bad that fishes are in danger of dying through lack of oxygen.

If ice has covered a pond for a week or two it is quite possible that when it thaws the water will look a very dark colour. If this is the case it is possible that some of the fishes may be badly affected by this and as much as possible of the water should be changed. This is especially important after there has been a heavy fall of snow, as it seems to have a bad effect on the pond water. During long severe spells it is important to examine the pond occasionally to make sure that a crack has not developed in it, allowing most of the water to drain away. This sometimes happens and it is difficult to do a repair during the cold spell. The fishes should be caught and placed in a safe place but little may be possible in the form of repairs to the pond until all frost has gone.

Temporary repairs can be made so that the pond will hold water until permanent help can be given in the spring. Many people get this trouble through not taking sufficient care to make a strong and thick mixture when making the pond. If only more time was taken when building a garden pond more time could be saved afterwards. Should a great crack develop and much of the water drain away, immediate steps must be taken to prevent the heads of water lilies and other water plants from being damaged by the frost. If the tops of the plants are exposed and water cannot be replaced, the crowns of the plants should be covered with straw or bracken to protect them from the cold until water can again be introduced into the pond.

It is unwise to try to cover a small pond with sacking or other material to prevent freezing over as the lack of light over a long period can cause considerable harm to life in the pond.

FRIENDS & FOES No. 40

Tipulidae

PHYLUM:—Arthropoda, from Greek *arthron*—joint, and *podos*—foot.

CLASS:—Hexapoda, from Greek *hex*—six, and *podos*—foot.

TIPULIDAE is a very large family with almost 300 members, included in 37 genera. By no means all the different species have aquatic larvae, but occasionally the aquarist finds representatives of the aquatic genera in his outdoor ponds. These, like their terrestrial relatives, are usually herbivorous, so are not likely to eat eggs or fry of fishes. They themselves fall prey to large fishes, and to carnivorous larvae and insects. The larvae are dependent upon atmospheric air for their existence, and have a pair of quite large spiracles on the last abdominal segment.

If forced to remain submerged they can close the spiracles within the fleshy lobes which surround them but manifest discomfort as soon as the air already in the air tubes is exhausted. Their heads can be withdrawn within the first thoracic segment. The larva

Crane Flies

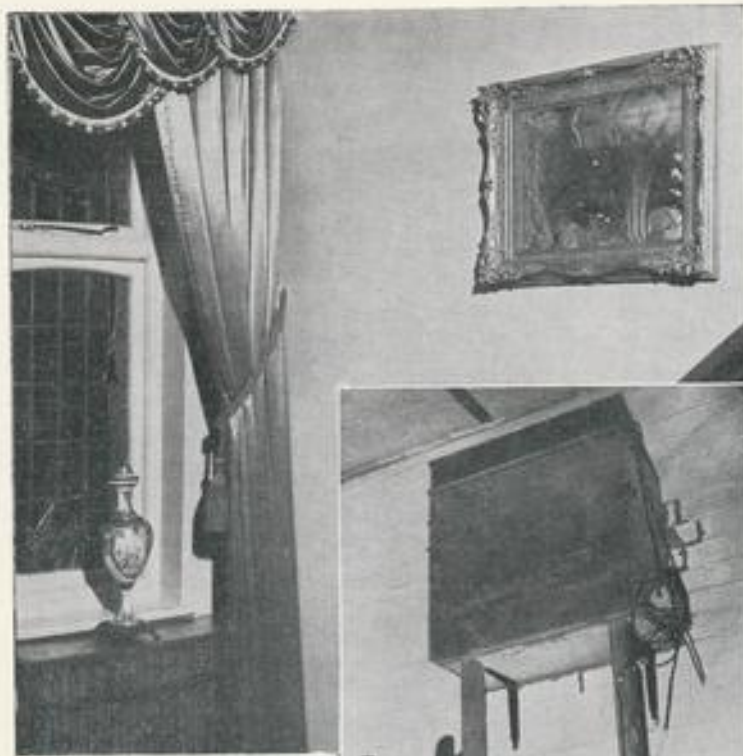


Larva with head extended (X2)

depicted above shows this extended. When moving while being examined it used its mouth to grip the glass container. Underneath its body were a number of fleshy protuberances, each surmounted by a fringe of minute hairs. These greatly assisted its movements.

Tipulidae larvae are unable to swim, falling heavily to the bottom as soon as they relinquish or are shaken from their hold. Pupation in the aquatic genera occurs in the same season that the eggs are laid, the larvae climbing out of the water and burying themselves in soft mud in late summer and early autumn. Both larvae and pupae vary in size according to the species.

C. E. C. Cole



Above is shown the gilt-framed aquarium "picture" in the home of Mr. P. Lewis. To the right is a view of the boxed tank behind the wall in a built-on garage



Sideboard, cocktail cabinet and aquarium are combined in the piece of furniture shown with the doors open and closed in the pictures in the centre of these pages. The cabinet is walnut and a hinged top permits access to the aquarium. It is the property of Mrs. Hobbs

Palm tree cut-outs in a "Palm Beach" scene surround the aquarium standing on a bronze-finished wrought stand in the home of Mr. D. Halsey, as shown on the left.

Aquaria and Deco

PHILIP DEE, who has become known as the "Aquarium Television" man, is an enthusiast for harmonious surroundings. Since he has had a good deal of experience in home surroundings, through his connection with *Aquarist* has asked Mr. Dee to describe

Photographs by LAURENCE E. PERKINS

THE trend to incorporate tropical fish aquaria in the home decoration plan, as a distinct article of furniture, is rapidly increasing. This article describes and is illustrated with only a few installations which will substantiate this fact, and I am fully convinced that having read the following words you will ask yourself many questions, so if I can be of assistance in answering or simplifying anything for you, I shall have at least served to further this up-to-date tendency. Although the emphasis in the accompanying photographs by Mr. Laurence E. Perkins, is on the aquarium as a unit, the reader can, with a little imagination, construct the rest of the picture of the room, or hallway surroundings from the descriptions which follow.



or in the Home

the B.B.C. Tropical Fish Man in Children's
between aquarium and home furnishings.
in adapting aquaria to blend with their
Ascot Aquaria of Clapham, S.W.4. The
of his ideas for the benefit of readers.

ENCE E. PERKINS

There is a definite air of distinction which impresses one on entering the hall-way of Mr. P. Lewis's beautiful home in Streatham. The close fitted green carpeting throughout the hall winds its way up the panelled stairway, enhancing the rich ivory coloured walls. The stained glass window, artistically draped with soft green velvet curtains, enraptures one with a feeling of supreme quality; even the radiator pipes in front of the window have been skilfully adorned with a gilt wrought iron grid. Amid such surroundings I tried to visualise an aquarium that would be suitably regal and elegant in design.

After much meditation the idea of an aquarium built in the wall to form a picture appealed to me, and I proposed the idea to Mr. Lewis, who was very

(Continued overpage)



To fit the exotic oriental surroundings of Mrs. Meyer's home in Streatham a jet black finish was given to the aquaria unit depicted above, and fishes and plants in gold were added to the frame. The large aquarium is for tropical fishes and a small tank below it is used for fry; the left-hand tank houses coldwater fishes

Standing on a hotel landing in London, the frame, cover and stand of the aquarium pictured to the right have been concealed with "Flexi-Mirror" strips to give a bright and sparkling finish



Aquaria and Decor in the Home

(Continued from preceding page)

much in favour of it. So with his approval I installed a tank in the outer wall of the house, the other side of which is the garage, and as shown in the photographs the aquarium is completely boxed in, with hinged sides, so that it is easily accessible for servicing. The unsightly angle iron I concealed with a gilt 3½ ins. wide picture frame, thus giving an enchanting and ever changing delightful picture, which, I suppose, one could call "ultra modern art." The aquarium interior is lined with imitation rock work to resemble a cliff face under water, with matching Westmorland stone, furnished with spatterdock, three varieties of *Cryptocoryne*, *Vallisneria spiralis*, *Cabomba* and *Hygrophila* and approximately eight species of the more common tropical fishes in fours.

When Mrs. Hobbs, of West Kensington Court, Cromwell Road, invited me to her flat with a view to designing a suitable aquarium, I did not know then that I should later be classifying it among my favourite designs. She explained that she required a sideboard, cocktail cabinet and aquarium. I think, possibly, the aquarium should come first, since she is a great lover of tropical fishes and tends to regard them as her "children," but since the aquarium is the smallest item of the three, the others must be given precedence. The object was to dispense with the sideboard and cocktail cabinet and somehow combine all three into an attractive piece of furniture, as living space in a modern block of flats is limited.

I have found that most sideboards eventually get used for all kinds of odds and ends instead of their original purpose for keeping table linen and cutlery, so I designed the cabinet as shown in the pictures, with three drawers, the two small ones for cutlery and the largest one, eight inches deep, for table linen. Above these I fitted shelves for glassware and drinks, and finally, of course, the bow-fronted aquarium, making it easily accessible for the slight attention required, by lifting the walnut top, which is hinged at the rear. When closed, it becomes an extremely attractive and dignified piece of furniture which is toned to match the other furniture in the room.

It stands on an emerald green close-fitted carpet; the soft furniture is green with cherry trimmings, and decoratively arranged curtains drape down beside the aquarium. As you can well imagine, visitors to Mrs. Hobb's flat are forever fascinated by this unique combination of exotic life installed in such a magnificent, yet at the same time useful article of furniture, which has given so much charm to this otherwise quiet corner.

The final choice of hotelier Mr. Bolton, of Sussex Gardens, London, was a 30 ins. by 15 ins. bow-fronted "Flexi-Mirror" aquarium, which I installed on the first floor landing of his hotel. It immediately seemed to bring life to the hotel, and Mr. Bolton noticed that the cold atmosphere that seems to embrace the stairways and corridors of a great many hotels was transformed into one of gaiety and warmth. Numerous types of floral decor had been tried in the past but somehow they lacked the life and brightness that this aquarium has given. It is so well illuminated that the whole landing seems to have been completely reconstructed. Looking up the long flight of stairs from the hall-way one's eyes are immediately attracted to the glitter from this aqua "fairyland," and approaching it down the stairs from the second floor it becomes the centre of attraction.

Mr. Alfred Hill and Mr. Douglas Halsey, of Northway, Morden, are both very keen hobbyists, and they have



Photo :

Laurence E. Perkins

An unusual aquarium and cover in Oriental style displayed at this year's National Aquarium Exhibition

realised like so many other people that the art of fish-keeping is rapidly becoming incorporated with home decor.

A photograph illustrates the choice of Mr. D. Halsey for his ivory and bronze decorated hall. It is a wrought iron unit finished in modern bronze. I designed the front-piece, which seems to have become very popular. It is a "Palm Beach" scene with an aperture cut out to conform with the picture, and it hides the angle iron aquarium frame. This frontpiece is tacked on to a thin piece of wood which rests upon the top front angle iron bar, so that it can be lifted off for a plain tank view.

Mrs. Meyer, who now lives in Streatham, originally came from Burma, and her orientally furnished home is breath-takingly exotic. There is an atmosphere of the mystic Orient, which almost seems to overpower one with enchantment, throughout the entire flat. Amidst such surroundings I was faced with the problem of placing a suitably designed aquarium unit. After considerable thought I eventually decided upon a design which I feel is most fitting. I painted the whole unit jet black and superimposed motifs of fish and plants in gold around the angle iron framing.

The top aquarium, which is surmounted by a Buddha, houses the multi-coloured tropicals; the lower left aquarium contains a variety of coldwater fishes and on the right hand side of the lower tank is a "maternity ward" and space for foods, etc. Personally, I think that this aquarium has added further distinction to the already wonderful oriental charm of this home.

In conclusion, I think that, given forethought, an aquarium can do more for a hall-way or lounge than merely represent a "tank of fishes," and I for one, delight in helping to display our interest in a manner which enhances, rather than condemns, the art of fish-keeping.

Black Angels in London

A PAIR of black angel fish, said to be members of the trio making the only examples of this colour mutation to be seen in this country, were on view at last month's show staged by the Association of South London Aquarists' Societies. Like the U.S.A. specimens described in *The Aquarist* last month, the fish were genuinely "all-black."

OUR EXPERTS' ANSWERS TO READERS' QUERIES

I am a beginner in tropical fishkeeping and wonder whether you will inform me whether I should be able to keep angel fish and guppies together in the same tank?

Very small angel fish will not do any harm to fully-grown guppies, but they will certainly chase after and eat guppy fry. As the angel fish grow into larger fish they will not be content with making a meal of baby guppies, but will attack the adult fish, especially the tiny males.

Is it possible to breed the kuhli loach in captivity?

The kuhli loach has been bred in captivity, but not very often. They are said to press their bodies close together when spawning, but very little is known about their breeding habits.

Would you please supply me with the names of some fishes which would live well together in a large community tank? Small species, please.

We suggest that you take your pick from the following: glowlight tetras, neon tetras, bloodfins, zebra fish, cherry barb, pearl danio, beacon fish, *Corydoras* catfish, guppies, platys and Australian rainbow fish.

I have just bought a silverish fish with flattened sides which the dealer said was a salmon discus. Please can you tell me the scientific name of this fish?

The scientific name of the so-called salmon discus is *Ephippicharax orbicularis*. The species comes from the Amazon basin and northern Brazil, and is easy to keep and feed. The salmon discus is quite at home in the community aquarium.

Please can you furnish me with some information about the breeding habits and general requirements of the pencil fish?

The genus *Poecilobrycon* (pencil fishes) is native to Guiana and the Amazon Basin. These fish are docile, and should not be placed with bullying or boisterous species. Pencil fish need a temperature of about 75° F., though they are hardy enough to withstand a temperature down to the middle sixties. Food should be given small, for the fish have tiny mouths. They are not fussy about what they are given

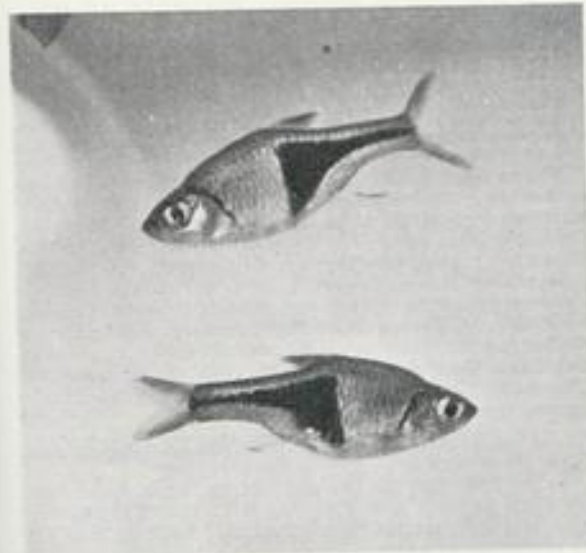


Photo:

Laurence E. Perkins

A fish that must still be placed in the "difficult to breed" class is the harlequin (*Rasbora heteromorpha*)

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.

to eat, and will take most dried foods, live foods, or finely minced meat. The pencil fishes do not breed very freely in captivity, but when they do they lay a few eggs in corners of the aquarium, close to the compost or even up among the surface plants. After spawning is over, the parent fish should be removed to another aquarium. The eggs hatch out in about three days, and the fry should be given the usual Infusoria, followed by tiny *Daphnia*, micro worms, or brine shrimps.

I am a newcomer to the interesting hobby of fishkeeping, but I am rather puzzled by the references to pH which I keep coming across when reading articles on aquarium keeping in magazines. What is pH, please?

In broad outline, water may be alkaline, neutral or acid. The pH (with a number) is the symbol or sign given to indicate the acidity or alkalinity of the water. pH 7 is neutral. Numbers above pH 7 indicate an alkaline condition; numbers below pH 7 indicate an acid condition. Most fishes flourish very well in slightly acid water with a pH of about 6.8. All the same, too much has been made of pH by some aquarists. If an aquarium is doing well, that is, has clear water, healthy plants and active fishes it is wise to leave well alone. Too much meddling with acids and salts often causes more harm than good. If you wish to acidify water naturally, filter it through peat or dried oak or beech leaves. Or place a handful of oak or beech leaves in about a quart of water and leave to soak for a week, after which strain the water into the aquarium. Peat water added to the aquarium will help to create acid conditions.

Please will you tell me the way to breed the harlequin fish?

The harlequin fish (*Rasbora heteromorpha*) is not a very easy fish to breed. The species needs acid water, and broad-leaved plants such as *Cryptocoryne* arranged in clumps in the middle of the aquarium, and some smaller clumps at both ends. Light entering the aquarium should be from the top, and not too bright. The compost should be spotlessly clean, preferably well-washed fine shingle or tiny pebbles. When the female is ready to lay her eggs, she will swim up to a leaf, turn upside down and rub her ventral region along its under-surface. The male follows close behind the female in order to fertilise the eggs as they are laid. After spawning is over, net the fish and transfer them to another tank. At a temperature of about 82° F., the eggs should hatch out in about 30 hours. Two or three days later, the baby fish should be swimming freely about the water looking for tiny live food—Infusoria. This all sounds very easy, but as we mentioned above, the species is not one that will breed for everybody. The pH value of the water, the quality of the light, the chemical composition of the water, the plant life, among other things, all play an important part in persuading these lovely little fish to lay their eggs. Some aquarists have been lucky from the start; others keep trying with no success. Like the neon tetra, the species needs studying and careful attention.

I stocked my new 18 ins. by 12 ins. by 12 ins. aquarium with several pairs of fishes including guppies, swordtails, zebra fish and half-banded barbs. All went well for a month or so; then, for no apparent reason, the fishes became listless and died. The

temperature of the water was maintained at about 82° F. The tank was brightly illuminated at night by electric strip-light, and I used to give the fishes extra oxygen by means of an air-pump. Can you please tell me what went wrong?

From your description, we think it highly probable that your fishes died either of "suffocation" or poisoning. Perhaps you allowed too much uneaten food to accumulate on the floor of the aquarium. Uneaten food will soon pollute the water, and send the fishes moping into the corners, or mouthing all over the surface for a breath, as it were, of pure air. Even an air-pump cannot restore badly polluted water to a healthy condition within a few hours and the oxygen content of the water at the rather high temperature will be lower than normal. On the other hand, you might have had some metallic object in contact with the water. Brass, copper, zinc, galvanised iron and the like will soon contaminate aquarium water and kill the fishes—and even some of the plant life. We advise you to check your aquarium set-up. Make sure that the compost is thoroughly clean; see that no metallic objects are in constant contact with the water; make sure that your heater and thermostat (if you are using one) are functioning properly, for sudden cessation of current when the weather is cold will lead to bad chills and other disorders. Warn members of your household not to lean over the uncovered aquarium with lighted cigarettes in their mouths (cigarette ash is not good for fish), or put their hands into the aquarium immediately after they have been using soap, washing powder, insect sprays and the like. Quite a number of fish fatalities may be traced to carelessness in simple aquarium hygiene.

I have a 18 ins. by 12 ins. by 12 ins. aquarium stocked with a pair of small angel fish, a pair of platys, a pair of mollies, some guppies, a pair of bloodfins, and a male fighting fish. I should very much like to introduce a few more pairs of fish into the aquarium, but wonder whether the tank would stand it?

It would be unwise to introduce any more fishes into your aquarium. The angel fish will increase in size during the next few months, the mollies must have plenty of space in well-oxygenated water; and the guppies, mollies and platys will surely drop young sooner or later; so you see

your aquarium is scarcely large enough to support the fishes you have at the present time in comfort.

I am thinking about installing fluorescent lighting over my aquaria, but I have been told that this type of lighting is not very successful. What is your opinion, please?

Water plants do not grow very well under the bluish-white fluorescent tubes, but they seem to prosper under the tubes which emit a yellowish or "warm white" light. Your local electrician or electricity department would advise you on the most suitable tubes to use, for you must bear in mind that fluorescent tubes give a much more intense light than ordinary strip-lights or conventional pearl or clear glass lamps in reflectors. For example, a 40-watt fluorescent tube gives the equivalent of about 60 to 80 watts in ordinary lighting.

I have a tropical aquarium in perfect condition with healthy fishes, and a fine growth of water plants. But I am worried because a few days ago I noticed a tiny grey or dirty yellow creature "sporting" among the underwater foliage. This tiny creature seems to feed on algae and decaying plant life. I have not seen it attack or take any interest in the fishes. Can you possibly identify the creature for me—it swims in a jerky, erratic fashion? Do you think I should transfer the fishes to another aquarium?

Perhaps the tiny creature you have noticed is a *Cyclops*. *Cyclops* is easily recognised; for its two eyes are fused into one dark mass, and the female carries about with her two pear-shaped egg-sacs which look like tiny water-wings attached to her body. Most of the smaller fishes will eat *Cyclops*, but a few of the larger species consider it beneath their dignity. If your fishes are enjoying good health, leave well alone. If, on the other hand, you would prefer to be free of the interloper in your aquarium, transfer the fishes to another tank, and increase the temperature of the water by a full 20 degrees (we presume the aquarium is maintained at around 75° F.). In the meantime, add a 5 per cent. solution of methylene blue to the water, drop by drop, until the water, plants and compost take on a distinctly bluish tinge. After a day or two reduce the temperature to normal, siphon off some of the water from the bottom of the aquarium, and add fresh water to make good the loss of the old water.

COLDWATER FISHKEEPING QUERIES answered by A. BOARDER

Recently I have had four shubunkins die in the space of a week. Their dorsal fin stayed erect and they have appeared quite lively until a day or so before their deaths. I opened two and found what appeared to be spawn inside, a pinkish stuff full of grey or whitish dots. Can you tell me the cause of death?

It is impossible for me to tell what caused the death of your fish from the information supplied. I can only make suggestions as to what may have been the trouble. Fishes do not just die in a day or two for no cause whatsoever. They will remain healthy for years providing they have the correct conditions. If something goes wrong with their health it is because of something you have done or have not done. When fish die without having had a lingering illness it is often due to the fact that the oxygen content of the water is insufficient or that, to put it another way, there is too much poisonous gas in the water. Heavy smoking in a room with little or no ventilation can kill fishes in a tank. The introduction of something poisonous into the water or arising from the container used for carrying the water will cause deaths. Something may be decaying and polluting the water. Something harmful may have been put in with the food. You should go over everything you have done lately to see if you can pin-point the trouble.

I have some good quality shubunkins, moors, veiltails, orandas and lionheads, from cup winners. I want to show them and shall be glad if you will tell me of a large book dealing with the subject

telling me how to pick out winners and how to make them look their best at shows. I would like it to deal with feeding, breeding and also to have colour plates and photographic studies of fish.

I know of no book which deals with showing fish almost exclusively. So few people show that I doubt if it would be a paying proposition to publish such a book. My book, *Coldwater Fishkeeping (The Aquarist)*, would be a great help to you for feeding, breeding and giving types. In *Goldfish*, by Anthony Evans (Foyles), I have written a chapter on shows and showing. Then you should get *Show Standards for Cultivated Fishes*, from the Secretary, Federation of British Aquatic Societies, 1, Coronation Court, 31, Willesden Lane, London, N.W.6. This costs 2s. 8d. post paid. This book gives the outlines and points allotted for the various types you possess.

I had two small sunfish in a small tank which developed ragged tips to the pectoral fins. What is the cause please?

In the first place the two different species of sun-fish are not likely to agree in a small tank and some of the damage may have been started by fin-nipping. Some parasite may be present although in this case it is probable that other fin would have been attacked as well. These fishes keep up an almost continuous movement of these fins and it is possible that the coarse sand at the bottom of the tank may have started the trouble. Separate the fish, and give a brief bath



Most colourful of all goldfish types, the shubunkin should be mottled with blue, black, orange, red and yellow

in a weak solution of Dettol and water, this might help matters. See that the tank is kept extremely clean at all times as these fish love clear water. Live food should be given whenever possible.

Which is the cheapest form of heater to keep a shed frost-proof? I have only coldwater fishes, but, of course, I realise that a hard frost could break my tanks.

Glass-sided tanks would certainly break in an unheated fish-house during a freeze-up. The question of the cheapest method of heating is not an easy one to answer. I have been struggling with the same problem for very many years and still have some doubts. To ensure that your fish-house is safe you need a minimum temperature of 40° F. I have found that as long as the water does not fall below this level the fish, even small ones, are quite safe. The water would not freeze, of course, and so the tanks would be safe. I think that the best way to keep this temperature is by using electricity. You can use tubular heaters sufficient to provide the necessary heat and have a thermostat set at 40° F. You would find that taking the whole year round you would not have to use a great deal of electricity unless the shed was very large or draughty. Once any sun reached the shed the heaters would automatically cut out; if it suddenly turned cold the heat would come on without any help from you. Any other type of heating will mean constant attention and work. Once a day an oil lamp would have to be cleaned to be safe and odourless, and a solid fuel stove would need attention at least twice a day. Then this heat is on all the time, often when it is not needed. A solid fuel boiler may give you more heat than you require. An oil lamp can be turned down but it is necessary to have it on many hours when it may not be wanted. Taking all things into consideration I say that electricity is your best form of heating, provided you do not intend to keep a high temperature in the shed, for then electricity would be very expensive.

Some of my fish are getting blanket weed tangled in their gills. Does this harm them and how can blanket weed be checked?

Are you sure this is blanket weed in the gills of your fish? It sounds to me as if the fish may be attacked by fungus. The fungus is white when it first forms but in an algae-infested water it soon turns green. Make certain before you do anything else, as the fungus in the gills can soon prove fatal. I have known small fantails get their tails entangled in blanket weed but do not think that the gills are likely to be affected by it. If fungus is present give the fish a salt treatment as recommended before in these pages.



Photos: Laurence E. Perkins
Prize-winning pair of veiltail goldfish. These were photographed as winners at last year's National Aquarium Exhibition

I have had a bad attack of fungus and tail-rot in my cold water tank. It contains shubunkins, moors, orfe, rudd, goldfish and catfish (very docile). The tank is 24 ins. by 12 ins. by 12 ins., well aerated, and has a pump filter. What is wrong?

Fungus and tail rot are usually the sign of something very wrong in management, when found in an indoor tank. I wonder if the "docile catfish" is to blame? Some of these fish can be fin nippers and they usually do this at night when you are not about. Any fin nipped would be likely to develop fungus. You do not say the sizes of the fish; the aquarium sounds overcrowded to me but, of course, the fish might be very small. They would have to be, to be safe. Your tank will hold, in good health, only 12 inches of fish whether you use an aerator or not. Directly a tank gets too many fish there is sure to be trouble. You say you change the water twice a week—why? My indoor tanks have not had the water changed during the past six years or more and remain quite healthy. About a sixth of the amount is removed whilst siphoning each week and replaced by fresh tap water, this is all that is needed. Check the sizes of your fish in relation to tank size and try to sterilise the tank before making a fresh start. If only aquarists would be content to keep a few healthy fish in a tank they would have far less trouble.

Can I keep and breed goldfish in an old sink?

You could keep a few goldfish in the sink but your chances of breeding are remote. The only way would be to have one pair of breeders only and then when they spawn either to remove the eggs for hatching elsewhere or else to take out the parent fish. If left with the eggs the fish would no doubt eat most of them and if any fry hatched these would be eaten. The sink could not be kept out of doors filled with water during the winter as the water would freeze and the tank would split.

I have just started keeping a goldfish in a globe about nine inches in diameter. How often should the water be changed, should the temperature of the water be the same when changing, and is the globe big enough for two goldfish and how can I differentiate between the male and the female?

The best advice I can offer you is to drop the globe and smash it whilst changing the water. Then go out and buy a proper aquarium in which a goldfish has a chance of being contented and healthy. For a coldwater fish to remain healthy for any length of time it is necessary for there to be at least 24 square inches of surface area to each inch of fish. The globe will not hold one fish comfortably

(Please turn to page 147)

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.

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

Improved Fishes Scheme

IN an attempt to interest members of my local club and to further improvements in stocks of selected fishes I have, on two or three occasions, suggested to local club members that selected members should be invited to take a few young fishes in an attempt to improve colour and size.

To ensure good specimen fishes being obtainable I put my proposals to two officials of the F.B.A.S. who had addressed our meetings and suggested that speakers who were breeders be invited to bring to our meetings reasonably good quality stocks of young fishes for sale to members who were interested in the scheme. This proposal was agreed to in principle and was noted for action but so far without tangible results. If the suggested scheme is not possible then perhaps some of your readers who are interested in improvements to stocks would perhaps oblige with alternative schemes. I should add that I have visited a number of dealers in London and south coast resorts and only on one occasion was I offered a pair of fishes which I thought might be suitable.

J.M.B., Hampshire.

Simplified Pond-making

WITH reference to the letter from the Rev. A. B. de T. Andrews published in the July issue of *The Aquarist* I would like to describe how I mature my pools in only a few days. I find that raised ponds are less work to make and give less trouble with frogs, etc., entering them.

My pools consist of base stones rammed into the earth and on this a layer of concrete with fine gravel, 1½ ins. thick; the sides are built up five to six inches thick and 18 ins. high. A depression made in the base provides a depth of two feet over about one-third of the pool. After only one week I fill up with water to which I add potassium permanganate sufficient to give it a deep red colour. After three days I drain the pool and with two buckets of clean water I scrub the pond thoroughly. It is then filled again with tap water and the water plants, in pots, are placed in position. A week later the fishes are introduced. I have made four ponds in this way which contain flourishing water lilies, plants and fishes.

A. A. WARD, Birmingham 26.

Hardy Shubunkins

RECENTLY I was away from home for eight days, during which time my fishes were entirely unattended. Their tanks were well supplied with growing plants, which my goldfish eat in copious quantities at all times. On the morning after my return I had no time to provide them

with more than a modest portion of Bemax, and as I had to go out on the evening of the same day again they received scant attention—their supper consisting of a mouthful each of scrambled egg from my own plate.

Next morning, approaching the fish tanks with a heavy conscience and a plate of chopped earthworms, I was surprised to find that a pair of three-inch shubunkins who have lived together in a 24 ins. by 12 ins. aquarium since early spring, were spawning for the fourth time this year! They had received no protein food for ten days apart from the mouthful of egg mentioned above, but they showed no signs of exhaustion or debility after spawning and ten days later they spawned again for the fifth time this season.

Incidentally, when I went away I was forced to leave some of the one month old fry from the shubunkins' second spawning in two enamel bowls in water thick with algae, into which I had emptied just before departure large quantities of baby *Daphnia*. I fully expected to find these fishes dead or severely debilitated on my return, but they had more than doubled their size and were very fit. Now, at eight weeks of age they are one inch long and quite fat. Although some weakness as a result of being left unattended may show up in the future there is no sign of this at present. It looks as though even fry can get along without us for a while! I think this is a testimony to the hardihood and vigour of these fishes when healthy.

(Miss) H. BOWMAN, Harpenden, Herts.

Hygrophila in Cold Water

YOUR June issue was received and enjoyed very much—especially the Editorial concerning the experiment with the fishes and plants in a sealed jar. Many adults will advise you to your face that they have heard that tropicals and plants can be purchased as a sealed unit to be set up in the home and that neither food nor aeration are ever required!

On page 53 of the same issue I found a mention of *Hygrophila* being used for coldwater aquaria. Our local zoo here in Cincinnati has a large 1,000 gallons tank well stocked with this plant and it grows over two feet in height; it is a coldwater set-up with large carp. The plant does well in good light, and our local member, Mr. Joseph Johannaman of Loveland Aquatics, was largely responsible for introducing it all over the U.S.A.

DON R. ABEL, *President*,
Greater Cincinnati Aquarium Society, U.S.A.

Albino *Pristella riddlei*

LAST May I spawned a pair of *Pristella riddlei*, and about three weeks later spawned them again. Until the first

fry were about six weeks old they all looked alike. Then one day I noticed one very light-coloured fish, looking almost like a different species. The tank and the nylon wool spawning medium I had sterilised and the water had been boiled before the spawning so I could not see how it could be anything other than a *P. riddlei*.

The fry grew like Jack's bean-stalk and a week or so afterwards I saw two more fry the same queer colour. I separated the unusual trio and looked through the fry from the second spawning. This had been a poor one, not many eggs being laid. To my surprise another queer fish was seen, and it was added to the other three. Now these fish are about one inch long and I think they are perfect albinos. They have red eyes which sparkle like rubies when the light catches them. The tips of their heads and their internal organs appear silver-pink but not far off white. The lateral line is a little more pink, whilst the flesh above and below the lateral line is so free from colour as to be almost invisible. The black spot found on the bodies of *Pristella* is missing.

Their fins have the normal white and yellow marks in them but only two of the four have marks where the black should be, and these possess only streaky marks just in the dorsal and anal fins. The rays seem dark but the skin between, clear. Tail fins of all are very pale pink, not nearly as red as in their normal brothers and sisters. When I have a tank vacant I intend to spawn the parents again to see if any more sports turn up. If a pair is present in the four albinos I am hoping they will be tempted to breed.

J. R. SPERRY, Whitwick, Leicester.

Preventing Breakages

MAY I pass on a simple but useful tip? Whilst wiring up my heater and thermostat in circuit with indicator lamps I found that the glass tubes kept hitting one another and the wall. By putting the heater in one trouser pocket and the thermostat in the other I found I could work more quickly and easily, with the apparatus safe from damage.

D. J. JANKO, Harpenden, Herts.

Coldwater Fishkeeping Queries

(Continued from page 145)

and so do not try to keep two therein. In such globes a fish has rarely a chance to get out of the sun if it needs to do so. In a well planted proper tank a fish can live for many years, probably longer than the average fish could do in the wild. A male goldfish shows white "pimples" on the gill covers.

I have had some rocks and stones from the seaside given to me for my aquarium. Will they be safe to use?

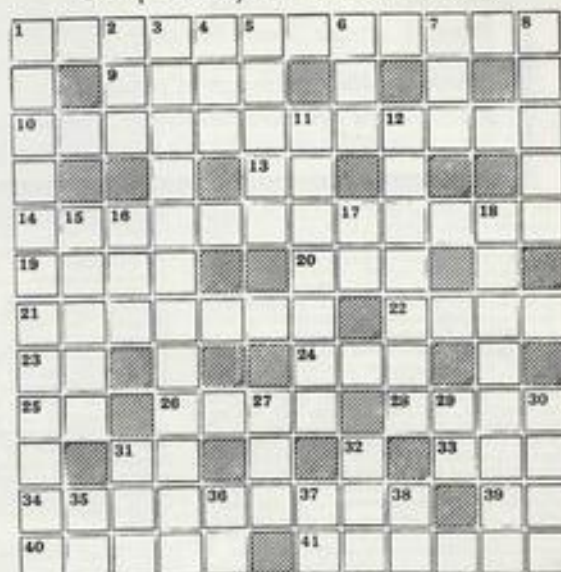
Providing you well wash the material it will be all right for your tank. Even a little salt will probably do more good than harm as it is a good disinfecting agent and appears to have a good effect on an ailing fish. As the rocks will have had all the sharp corners rubbed off by the action of the waves they will be far safer in the tank than many of the granite-like pieces, abounding with sharp edges, which I still see in furnished aquaria at even the large shows.

PICK YOUR ANSWER

- "As straight as the backbone of a . . ." The missing word is: (a) Herring, (b) Mackerel, (c) Pike, (d) Trout.
- Which one of the following species was named by Hamilton Buchanan? (a) *Rasbora daniconius*, (b) *Rasbora heterophylla*, (c) *Rasbora maculata*, (d) *Rasbora trilineata*.
- Cerimastix saladensis* is native to: (a) Argentine Republic, (b) Bolivia, (c) Ecuador, (d) Venezuela.

The AQUARIST Crossword

Compiled by J. LAUGHLAND



CLUES ACROSS

- Guiles go astray to give the variety of this barb (6, 6)
- Eject or expel (4)
- Instruments essential for tropical tanks and desirable also in coldwater aquaria (12)
- Female parent of 11 down (2)
- Koh-i-Noor of the tropical fishes? (7, 6)
- Petition, gift, or favour (4)
- Behold the carp for civil defence (1, 1, 1)
- Graciful, pleasing descriptive name of a *Rasbora* (7)
- A fin (4)
- Chinese weight or Chinese mile (i.e., from mile back) (2)
- Bring forth young (3)
- See how the loach starts (2)
- Lovely fabric with which is compared the Madagascar — plant (4)
- Fish are these of the ichthyolatrous (4)
- Thanks for the start of a tank (2)
- Downy covering of some plants (3)
- Bred from different species or varieties (5, 4)
- You will find it is at back as in tank (2)
- Herring family (5)
- The ichthyolatrous — fish (6)

CLUES DOWN

- Variety of Siamese fighting fish (5, 7)
- Eggs of fishes (3)
- A lens that concentrates the sun's rays (7, 5)
- American water soldier? (1, 1, 1)
- One of the breathing holes in the bodies of certain articulates (5)
- Famous West Country river (3)
- Hard water? (3)
- Fibre for cordage made of twisted sails (5)
- Dagong, supposed basis of mermaid legends (7)
- Becht-de-mer or sea-slug (7)
- A sheet of paper once folded (5)
- Tumbled ore is a start for fishes (3)
- Small junior (abbrev.) (2)
- Tallness (6)
- The head of the Cobitidae or loach family is also a head of maize (3)
- I put you on the answer (no liggery-pokery) (2)
- Saps return to watering places (4)
- This is too easy (3)
- Basic colour of the platy (3)
- Writer Stevenson's initials (1, 1)
- Salmon head for part of Empire (1, 1)
- And Gunners lead *Rasbora* (1, 1)
- Do try (2)

- Rasbora fasciolata* attains a length of about: (a) 2½ ins., (b) 4½ ins., (c) 6 ins., (d) 8½ ins.
- Fairy moss is the popular name of: (a) *Asolla*, (b) *Nepenthes*, (c) *Selaginella*, (d) *Wolffia*.
- Vallisneria* was named after: (a) a botanist, (b) a courtier, (c) a doctor, (d) a philosopher.

(Solutions on page 149)



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 copy of *The Aquarist's Directory of Aquarium Societies* will be sent free to any reader on receipt of a stamped, self-addressed envelope.

AT the September meeting of the **Aylesbury Aquarists' Association** a table show of tropical fishes was staged. This month Mr. A. Boarder is visiting the Association to give a talk on cacti.

TWO visiting aquarists from the continent, Mr. C. W. Pudney (Paris) and Mr. P. Boest (Holland) were welcomed at the August meeting of the **Bexhill and District Aquarists' Society**. Mr. Boest again visited the club last month and gave a talk on fish-keeping in Holland. Three judges have been going to members' homes to assess aquaria entered in the Home Aquaria Competition, and the challenge cup has been presented to the society's secretary Mr. D. Jelliffe for the best tank. Award cards have been presented to Mr. J. W. Willcocks (second), Mr. J. Holder (third) and Mr. D. Bates (commended). The judges, members of the Hastings society, gave their impressions of the entries, which were the subject of good-humoured argument at the meeting. A table show for labyrinths followed this discussion and the results were: 1st red, Siamese fighter Mrs. F. J. Good; 2nd, thick-lipped gourami Mr. J. W. Willcocks; 3rd, leeri gourami Mr. D. Jelliffe. Mr. F. Walker of Eastbourne judged the entries.

ENTRIES in the recent contest between **Cambridge and District Fishkeepers' Club** and the **Huntingdon Aquarists' Society** numbered 60. Cambridge won by 17 points (29-12). Results were as follows: Best in Show: Mr. Jackson (Cambridge) Angel fish. Class 1: Anabantids—1st Mr. Yardley (Huntingdon) Leeri gourami; 2nd Mr. Pinner (Huntingdon) Leeri gourami; 3rd Mr. Diver (Cambridge) Three-spot gourami. Class 2: Livebearers—1st Mr. Lambert (Cambridge) Sailfin mollie; 2nd Mr. Stickler (Cambridge) Red swordtail; 3rd Mr. Pinner (Huntingdon) Black mollie. Class 3: Barbs—1st Mr. Thurston (Cambridge) *B. schubertii*; 2nd Mr. Pinner (Huntingdon) tiger barb; 3rd Mr. Thulborn (Cambridge) *B. lineatus*. Class 4: A.O.V. Tropical—1st Mr. Jackson (Cambridge) Angel; 2nd Mr. Thulborn (Cambridge) Catfish; 3rd Mr. Stubblings (Cambridge) Black shark. Guppy Tank Competition—1st Mr. Taylor; 2nd Mr. Thulborn; 3rd Mr. Driver.

AT the aquarists' section of the Dagenham Town Show held on 27th and 28th August, staged by the **Thameside Aquatic Society** and **Romford Aquarists' Society**, a record number of entries was exhibited. Judges were Messrs. R. Mealand and C. W. Creed of the F.B.A.S. The Thameside society won the inter-club furnished aquarium competition. Best fish in the show was a red swordtail owned by Mr. W. Gawler. Other results were: Class 1: Tropical furnished aquaria—1st Mr. F. Ahrens; 2nd Mr. A. Wilson; 3rd Mr. F. Gill. Class 2: Coldwater furnished aquaria—1st and 2nd Mr. L. A. Land; 3rd Mr. B. Campbell. Class 3: Breeders' livebearers—1st and 2nd Mr. F. Ahrens; 3rd Mr. R. Alley. Class 4: Breeders' tropical egg-layers—1st and 3rd Mr. E. Thompson; 2nd Mr. F. Ahrens. Class 5: Breeders' coldwater—1st Mr. L. A. Land; 2nd and 3rd Mr. F. Balaam. Class 6: Fancy goldfish—1st and 2nd Mr. W. Gawler; 3rd Mr. F. Balaam. Class 7: Guppy—1st Mr. B. Ashman; 2nd Mr. L. Elliot; 3rd Mr. R. Alley. Class 8: a.o.v. livebearer—1st Mr. W. Gawler; 2nd Mr. F. Gill; 3rd Mr. R. Alley. Class 9: a.o.v. cichlid—1st and 2nd Mr. F. Ahrens; 3rd Mr. J.

Berkley. Class 10: Dwarf cichlid—1st Mr. L. A. Land; 2nd Mr. F. Ahrens; 3rd Mr. J. Morgans. Class 11: Barbs—1st Mr. W. Gawler; 2nd Mr. R. Danahay; 3rd Mr. F. Gill. Class 12: Danios, mountain minnows, Rasbora—1st Mr. F. Ahrens; 2nd Mr. W. Gawler; 3rd Mr. F. Ahrens. Class 13: a.o.v. characin—1st Mr. G. Ridwell; 2nd Mr. P. Gardiner; 3rd Mr. R. Morgans. Class 14: a.o.v. labyrinth—1st and 2nd 3rd Mr. F. Ahrens. Class 15: a.o.v. tropical—1st 2nd and 3rd Mr. F. Ahrens. Class 16: water plants—1st and 3rd Mr. F. Ahrens; 2nd Mr. W. Gawler.

NINE tropical aquaria and four coldwater tanks were exhibited by the **Guildford and District Aquarist Club** at their local Odéon cinema for a fortnight this summer. Last month the club heard a talk by Mr. T. James (Goldfish Society of Great Britain) on "The Magic of Coldwater Fishes."

UNUSUAL breeding experiences was the subject of a talk given by Mr. T. Hodgson (Leeds A.S.) to the **Halifax and District Aquarists' Society** last month. A table show for tropical and coldwater plants was also held.

THE newly formed **Independent Aquarists' Society** reports its first success in an open show. This was the first prize awarded to the club's

Don't forget the dates!

5-9 OCTOBER

British Aquarists' Festival
at Belle Vue, Manchester

furnished coldwater aquarium entry at this year's Hendon show; the tank was set up by Mr. E. G. Harris.

FIRST show staged in August by the **Kirkcaldy and District Aquarist Society** received 80 entries and proved to be a successful venture. Winners were as follows: Tropical furnished aquaria—1st Mr. Peter Low (Kirkcaldy); 2nd Mr. Edwin Headley (Kirkcaldy); 3rd Mr. Fred Wilkinson (Kirkcaldy). Coldwater furnished aquaria—1st Mr. David Henderson (Glenrothes); 2nd Mr. W. Anderson (Kirkcaldy); 3rd Mr. W. Anderson (Kirkcaldy). Breeders' Egg-layers—1st Mr. E. Hedley (Glenrothes); 2nd Mr. P. Low (Kirkcaldy); 3rd Mr. C. Beardmore (Edinburgh). Breeders' livebearers—1st Mr. E. Hedley (Glenrothes); 2nd Mr. E. Hedley (Glenrothes). Guppies (6 males)—1st Mr. P. Wilkinson (Kirkcaldy); 2nd Mr. G. Carr (Dysart). Guppies (6 females)—1st Mr. G. Carr (Dysart). Single-tail coldwater—1st Mr. D. Henderson (Glenrothes); 2nd Mr. H. Jackson (Kirkcaldy). Characins—1st Mr. P. Low (Kirkcaldy); 2nd Mr. P. Low (Kirkcaldy); 3rd Mr. G. Carr (Dysart). Livebearers—1st Mr. A. J. Herd (Edinburgh); 2nd Mr. H. Kerr (Edinburgh); 3rd Mr. C. Beardmore (Edin-

burgh). Rasbora—1st Mr. A. Blair (Kirkcaldy); 2nd Mr. P. Low (Kirkcaldy); 3rd Mr. A. Blair (Kirkcaldy). Danios—1st Mr. H. Kerr (Edinburgh); 2nd Mr. W. Carter (Glenrothes). Barbs—1st Mr. C. Beardmore (Edinburgh); 2nd Mr. E. Headley (Glenrothes); 3rd Mr. G. Carr (Dysart). Labyrinths—1st Mr. A. J. Loughton (Edinburgh); 2nd Mr. E. Headley (Glenrothes); 3rd Mr. W. Anderson (Kirkcaldy). Catfishes—1st Mr. P. Low (Kirkcaldy); 2nd Mr. G. Beardmore (Edinburgh); 3rd Mr. E. Headley (Glenrothes). Cichlids—1st Mr. G. Beardmore (Edinburgh); 1st Mr. P. Low (Kirkcaldy); 2nd Mr. E. Headley (Glenrothes).

IN August six aquaria were exhibited in a local works flower show by the **Merseside Aquarists' Society**. At a meeting attended by other local societies last month a talk was given by Dr. F. N. Ghadially on diseases of fishes.

AT a table show staged during a recent meeting of the "**Pieces**" **Aquarist Club** (Dulwich) one club member, Mr. G. Gale, gained first, second and highly commended awards. The club programme for the next six months is now ready and copies may be obtained on application to the secretary Mr. F. S. Savers, 3, Rokell House, Beckenham Hill Road, Beckenham, Kent.

FIGHTING fishes were arrayed at a recent table show held by **Pontefract and District Aquatic Society**. Mr. R. Bramley's entry was judged best and awarded the Poundford Shield and replica. This month the society is making a coach trip to visit the British Aquarists' Festival at Manchester.

SECOND and fourth awards were gained by the **Southern Amateur Aquarists** at the Portsmouth show this year. Last month the club was visited by Mr. J. McInerney, who spoke about his experiences in breeding tropical fishes.

FIRST holders of a new trophy awarded at the **South West Middlesex Aquarist Association's** inter-society finals gala recently were **Uxbridge and District Aquarist Society**. The trophy, pictured on the opposite page, has been presented by the association's secretary, Mr. A. H. Charles, in memory of his late wife, and it is to be known as the "Diana M. Charles Memorial (Perpetual) Challenge Trophy," for award each year. Certificates have been given by the association to those senior judges who passed the examination last year with 75 or more points.

RESULTS of the **Welsh National Aquarists' Society** show held in Cardiff are as follows: Class 1: Goldfish—Mr. V. Capaldi (Bristol A.S.); Class 2: Shubunkin—Mr. H. V. Jenkins (W.N.A.S.) best coldwater fish in show; Class 3: Fancy Goldfish—Mr. H. V. Jenkins (W.N.A.S.); Class 4: a.o.v. Coldwater Fish—Mr. J. Amesbury (W.N.A.S.); Class 5a: Male Guppy (Longtail)—Mr. R. S. Wigg (S. Wales Sect. G.B.S.); Class 5b: Male Guppy (Short tail)—Mr. J. Amesbury (W.N.A.S.); Class 5c: Female Guppy—Mr. R. S. Wigg (S. Wales Sect. G.B.S.); Class 6: Mollies—Mr. R. S. Rosser (Rhondda A.S.); Class 7: Platy—Mr. D. H. Sanders; Class 8a: Male Swordtail—Mr. F. Rochell (W.N.A.S.); Class 8b: Female Swordtail—Mr. I. Biddle (W.N.A.S.); Class 10: Siamese Fighter—Mr. A. V. Williams (W.N.A.S.); Class 11: a.o.v. Labyrinth—Mr. W. H. Webb (Hereford & W.N.A.S.); Class 12a: Male Barbs—Mr. and Mrs. Spurrier (W.N.A.S.); Class 12b: Female Barbs—Mr. S. Jenkins (W.N.A.S.); Class 13: Characins—Mr. W. H. Webb (Hereford & W.N.A.S.); Class 14: Cichlids—Mr. W. H. Webb (Hereford & W.N.A.S.); Class 15: Minnows—Mr. I. Biddle (W.N.A.S.); Class 16: a.o.v. Tropical Fish—Mr. W. H. Webb (Hereford & W.N.A.S.) Best tropical fish and best fish in the show; Class 17a: Breeders' Class Coldwater—Mr. V. Capaldi (Bristol A.S.); Class 17b: Breeders' Class Tropical—Mr. R. S. Wigg (Llanwit Major A.S.); Class 18: Furnished Aquarium, Mr. R. Brotherton (W.N.A.S.); Inter-Society Contest—Llanwit Major A.S.

Oldham Show

THE annual show staged by the Oldham and District Aquarist Society late in August was the fifth that has been held.

Increased entries from local exhibitors was reported, although smaller entries from Bury and Rochdale were obtained than usual since the show coincided with holiday week there. Best furnished aquarium in the show was entered by Rochdale Aquarist Society and best fish was the entry by Mr. B. Taylor in the a.v. *Aphyoseiurus*, *Riesleri* and *Pischox* class. Judges were provided by the Federation of Northern Aquarium Societies.

F.B.A.S. Guides

LATEST Guides and Technical Data sheets issued by the Federation of British Aquatic Societies comprise the following: Show Fish Guides Introduction; Aquarium Plants Classification; *Gymnocorymbus terezae*; *Hemigrammus erythrozonus*; *H. ocellifer*; *Rasbora heteromorphus*; *R. maculata*; Genus *Trichopaster*; *T. leeri*; *T. pectoralis*; *T. trichopterus*; *Hypphaesobrycones*; *H. innesi*; *T. rosacana*; *H. serpas*. Each sheet measures approximately 8½ ins. by 5½ ins. and is punched to fit the F.B.A.S. loose-leaf file. These guides, which are printed and illustrated with clear line drawings of fishes, are intended not as standards for the species but as characterisations for the guidance of judges and others. One sheet covers each fish and the numbering allows them to be arranged in the file alphabetically by species within a family. They are obtainable from the F.B.A.S. secretary, Mr. R. O. B. List, 1, Coronation Court, Willesden Lane, London N.W.6.

Judging Charts

NINE judging charts for fishes covering the groups 1, characins; 2, barbs; 3, labyrinths; 4, *Rasbora*, danios and minnows; 5, livebearers; 6, catfishes; 7, coldwater fishes; 8, other genera; 9, cichlids, have been compiled by the South-West Middlesex Aquarist Association. The duplicated sheets give size, shape, finnage and colour details of the fishes listed, with suggested scales of pointing. They may be obtained from the Association's secretary, Mr. A. H. Charles, 91, The Parade, Uxbridge Road, Hanwell, Middlesex, price 2s. 6d. the set.



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 1s. 9d. 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.



"The Diana M. Charles Memorial Perpetual Challenge Trophy, presented to the South West Middlesex Aquarist Association for inter-society competition for tropical and coldwater fish" reads the engraving on this handsome mahogany backed plaque now held by the Uxbridge and District A.S.

Notts. Show Results

RESULTS of the Nottingham and District Aquarist's Society show held last month are as follows:

Fancy goldfish competitive exhibits—Common goldfish; 1, Mrs. G. Revitt; 2, A. E. Adcock; 3, W. Town. Black Moor—1, W. Town. Bristol Shubunkin—1, H. P. Lynn; 2, A. E. Adcock; 3, Mrs. Adcock. Veil Tail—1, M. Welch; 2, H. H. Ede. Fantails—1 and 2, W. C. Webley.

Tropical competitive exhibits—Swordtails—1, J. C. Wood; 2, C. Easter; 3, J. G. Wood. Male Guppy—1, H. P. Lynn; 2, M. Smallbone; 3, M. Welch. Serpae and Flame fish—1, C. Easter; 2, M. Welch; 3, J. G. Wood. Bracons or Featherfins—1, H. R. Odam; 2, M. Challan; 3, H. R. Odam. Fighters—1, C. Easter; 2, R. Tompkin; 3, C. Hill. Dwarf Gourami—1, C. Orpen; 2, A. Saxton; 3, A. Stanley. Tiger Barbs—1, W. C. Webley; 2, A. Saxton; 3, W. C. Webley. Harlequins—1, M. Welch; 2, J. G. Wood; 3, H. P. Lynn. Catfish—1, H. R. Odam; 2, H. P. Lynn; 3, E. Clarke.

Breeders' class, coldwater varieties—1, M. Welch; 2 and 3, H. H. Ede. Tropical egg-layers—1, W. C. Webley; 2, M. Welch; 3, H. Odam. Live bearers—1, R. Tompkin; 2, J. G. Wood; 3, M. Welch. Tropical furnished aquaria—1, Mrs. H. Lynn; 2, Miss M. Challan; 3, Mrs. D. Welch.

Coldwater furnished aquaria—1, M. Welch; 2, H. Lightfoot; 3, Mrs. P. Shipley. Best fish in the show—Bristol Shubunkin—H. P. Lynn.

London Lecture

DR. F. N. GHADIALLY is to give a lecture on aquarium-keeping and fish breeding as one of the lecture series open free to the public that is arranged by the London County Council. It will be held at the Horniman Museum and Library, Forest Hill, London S.E.23, 3.30 p.m. on Saturday, 19th November. Two films made by Dr. Ghadially will be shown at the lecture, entitled "Fish, Amphibians and Reptiles" and "Breeding the Brown Acara." The latter film was awarded a three star award at last year's Amateur Cine World contest. Dr. Ghadially hopes to meet as many London aquarists as possible at the lecture, where he will deal with questions on breeding.

Secretary Changes

CHANGES of secretaries have been reported from the following societies: Glasgow Northern Aquarium Society (Mr.

W. White, 46, Eveline Street, Glasgow E.1.); Penistone Aquarists' Society (Mr. C. Round, 42, Fearnley Road, Hoyland Common, Barnsley, Yorks.); Redhill and District Aquarist Society (Mr. W. S. Elliott, 6, Arbutus Road, Redhill, Surrey).

Aquarist's Calendar

5th-9th October—British Aquarists' Festival organised by the Federation of Northern Aquarium Societies in collaboration with *The Aquarist* at Belle Vue Zoological Gardens, Manchester.

6th-8th October—Gloucester and Cheltenham Aquarists' Society fourth annual members' show at Empire Hall, Cheltenham. First day open 2 p.m.; other days, 10 a.m.

13th-15th October—Reading, Oxford and High Wycombe Aquaria Societies annual Three Counties Show at the Palmer Hall, Reading. Schedules available from Mr. F. H. Crane, 26, Kensington Road, Reading.

18th October—Cambridge and District Aquarists' Society members' show at Tracey Hall, Cockburn Street, Cambridge. Judging 3 p.m.

20th-22nd October—North Birmingham Pond and Aquarium Society fifth annual show and exhibition at the Alexander Sports Ground, Perry Barr, Birmingham.

24th October—British Herpetological Society (London Group) meeting: "Crocodiles and Tortoises," 7 p.m., at the Linnean Society's Rooms, Burlington House, Piccadilly, London, W.1.

27th-30th October—Accrington and District Aquarist Society sixth annual show at the Town Hall, Accrington. Details and schedules from show secretary Mr. F. W. Hartley, 47, Tremellen Street, Accrington, Lancs.

28th-29th October—Corby and District Aquarists' Society first annual open show at the Rockingham Road Infants' School Hall, Corby. Schedules from show secretary Mr. R. H. Dicks, 62, James Watt Avenue, Corby, Northants.

19th November—Free public lecture "Fishes, Amphibians and Reptiles" by Dr. F. N. Ghadially, 3.30 p.m. at Horniman Museum, London Road, Forest Hill, London S.E.23. Dr. Ghadially will also show his two films "Fishes, Amphibians and Reptiles" and "Breeding the Brown Acara."

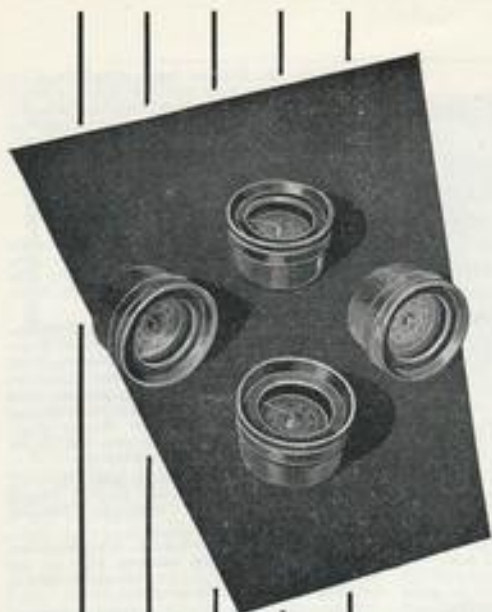
2nd December—British Herpetological Society (London Group) annual general meeting, 7 p.m., at the Linnean Society's Rooms, Burlington House, Piccadilly, London W.1.

Crossword Solution

B	A	R	B	U	S	C	E	L	I	U	S
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PICK YOUR ANSWER (Solutions)

1 (a). 2 (a). 3 (a). 4 (a). 5 (a). 6 (a)



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* 7/6 *

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