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and Pondkeeper

JANUARY 1966

MONTHLY
Vol. XXX No. 10

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See Page ix

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VOL. XXX No. 10 1966

The Aquatic Dealer

by R. S. B. PINKS

THE real dealer is the chap who gives you a pair of fish when you ask for two, and he should be carefully selected, because you will probably be together for life. It is preferable to begin the selection process when you are at school, partly because you have longer at it this way, and partly because the togetherness of the dealer and the schoolboy makes Freemasonry look like a Christmas Club.

The muddy youth enters the shop with much clanking of bottles and cans containing murky and heaving liquids. Without so much as a wink the dealer takes them, decants the contents, and passes across in return a little silver or a plastic bag containing some vital specimen from the tropics. Departs the youth, with no more than a look, which says plainly enough "Back on Saturday". Witness also the dealer with the look on his face of one who has done a big and satisfactory deal. Rates of exchange are never discussed; they never are, with experts on the job.

Goldfish from the Barrow

I suppose the earliest dealer I ever came across was the then-familiar figure in the streets of the East End of London—the old-clothes man who gave goldfish in exchange for one's left-offs. It was quite surprising how easily these goldfish used to die afterwards (not that I ever got any of them, as we never had many left-offs to exchange for goldfish); I never knew of one which survived for more than a week or so. This was not entirely due to the ignorance of their keepers, as the fish they bought from Woolworths used to thrive. No doubt it was the life on the barrows which disagreed with them.

Then there was the dealer who never really was. He was a silent but handsome man who used to lurk in the shadows behind a vast tank containing a solitary jack pike. It was a magnificent spectacle, for the schoolboy, on his way home, to stop by this shop and gaze at length through the windows at the keeper and the kept. Our hearts were heavy when at last a hideous shop of female clothing ousted the little pike from our lives—we never even found out where he went to.

The dealer who came to the school to lecture on aquaria

so scared us over the possibilities of losing our tropicals from some grisly disease that we hung on to our coldwater collections for a long time to come, but my own caution was overtaken by enthusiasm on one of my birthdays, when I was given a splendid aquarium, complete with chrome side pieces and a mirror back. It even had a plate-glass cover (surely, even today, the height of opulence!). I made the startling decision that I would breed the first British temperate guppies; it was then August, and with a little luck on my side I could acclimatise them by the onset of winter. My kindly dealer sold me a pair but warned me that I could change them for something more suitable if I later wished. That's what endeared me to dealers from an early age!

All went well for a week or so, and the female even produced a score or so of young. However, the latter weeks of September cooled things down to such an extent that even my conscience overcame me, and I decided that the guppies should have some heat after all. As we had no electricity, only gas, and there was parental opposition to the heating project as a whole, I had to turn to the simple wax night-light placed below the tank and suitably separated from it by a thin sheet of tin. I duly raised the tank on blocks of wood, put the tin and night-light in place, and announced to the family that all this fuss about heating was really a bit of a racket on the part of the Trade. At about 2 in the morning the glass bottom of the tank cracked with a sickening sort of noise which cannot be reproduced in print, and I spent the rest of the night mopping up and working out how many sunfish I could get into an 18 inch tank.

Back to the dealer went the guppies (the young went to the school tank, by kind arrangement with the Biology Master, with whom I was on nodding terms), and in their place was substituted a pair of paradise fish, quite the least pleasant creatures I have ever accommodated in the piscine line. They rapidly returned to the shop, to be followed by a succession of sunfish and bass which charmed us for a long time to come. The important feature of this cavalcade is that not a single coin changed hands between the acquisition of the guppies and the second round of bass. How this happened, I cannot quite fathom, but it goes a long way to establish the long-suffering tolerance of the dealer to the fancies and frustrations of youth.

Today's Dealers

The dealer today is a very different being—an opulent mogul whom one never sees because of the highly organised state of the industry. Doubtless, like a huge carp, he sits in a glass and chromium tank high above the metropolis growing fat on what man casts upon the waters, yet never getting caught himself. Perhaps this is a good thing for most of us, after all, for things never seem to have been quite so flourishing, with all the resultant economic benefits to the amateur. I cannot think of a hobby I have ever had anything to do with in which prices have remained so static over the years, and in some cases, have actually dropped. No doubt there are all sorts of sinister reasons why neon tetras should only now cost half a dollar (as compared with 10 bob, when I first started collecting), but this sort of fact tells when you are about to try and convince your better half that it is high time you took the hobby up again.

The small dealer is, perhaps, the most changed being, when one views the phenomenon in retrospect. He is no longer a purveyor, he is an expert; he not only knows the difference between coldwater and tropical fishes, he knows all their names; he not only knows all their names, he knows the scientific ones too, and can pronounce them correctly. Furthermore, he can breed the wretched things far better than you can, and has written papers on this and that. He gets into Print disgustingly regularly, and has found a number of errors in the Looseleaf Edition. All this puts him in a class of his own—something awe-inspiring almost. Yet, only the other day I saw him in deep conversation with a jam-jar-laden lad in the corner of the shop. Something changed hands, and perhaps it wasn't altogether coincidence that, in the window the following day, there appeared those hundreds of tadpoles, priced at six for twopence!

HOUSE PLANTS FOR THE FISH HOUSE

Spider Plants

(Chlorophytum)

AN easy to grow, attractive plant for the fish house is the spider plant, Chlorophytum. As the photograph shows, the plant has long narrow strap-like leaves, striped with yellowish white and green. The name comes from its long spider-leg-like runners which can reach several feet in length and which bear both small flowers and small plantlets. If the runner is pegged into a pot of soil at a plantlet, it will root and the resulting small plant can be severed when it grows larger.

Chlorophytum grows fairly rapidly and can be potted on in John Innes Potting Compost no. 2, when necessary, into a larger size of pot. The plant can soon reach a large size, the leaves reaching 17 inches or more in length. The plant likes a lot of light but not too much direct sunlight in summer. It should be watered well in summer, but only when dry in winter. Liquid feeds in summer are appreciated.

A plant suspended from the roof of the fish house, in a hanging basket, makes a very exotic decoration, enhancing the fish house environment.

B. Whiteside

The Rosy Tetra

Photo: G. E. Woodward

by H. E. R. THOMPSON

THE characin family contributes perhaps a greater number of beautiful fishes to our aquaria than any other family: they are usually long-lived, are hardy and easy to maintain in good health and of a size most suited to the average aquarium, some not exceeding 1½ to 1¾ in. at full growth. Add to this the fact that they are peaceful by nature (with few exceptions) and it is little to be wondered that they have attained such popularity. Not least among them is the beautiful rosy tetra (*Hyphessobrycon rosaceus*).

This fish is native to the fresh waters of British Guiana and Brazil, where it inhabits the jungle streams and rivers. In a community tank a shoal of four to six shows off to the best advantage, where they add charm and beauty with their gentle but lively disposition. The requirements of the rosy tetra (or rosaceus as it is so often called) are fairly simple: soft, slightly acid water is preferred with a temperature of 74°-80°F (23°-27°C). Given these conditions the coloration of the fish is noticeably intensified; a dark background also tends to bring out the colour. Prepared dried foods are readily accepted, but, like most of our fishes, they show an increased interest when live food such as white worms, *Daphnia* or mosquito larvae is introduced.

The male rosaceus carries a large dorsal, which is the greatest distinguishing feature between the sexes: it is mainly black with perhaps a slight edging of white towards the tip and tends to curve, giving the appearance of a feather. His anal fin is also somewhat larger than that of the female and has a distinct hook at the tip; it has a rosy hue with a milky white edging towards the tip. The tail or caudal fin carries splashes of red and the same applies to the ventrals; pectorals are clear; an adipose fin is present in this species. Body coloration is of a rosy shade flushed through silver, tending to become darker on the back of the fish. No shoulder bar is present as is seen in its near relative *Hyphessobrycon serpae*. A maximum size of 2 in. is reached by good mature male specimens; females are slightly smaller, and carry a smaller dorsal, which has a splash of white and red at the upper extremity.

Hyphessobrycon rosaceus is not classed among the more readily bred fishes of the family, but nevertheless responds to the correct conditions. The greatest difficulty appears to be in obtaining a pair that will mate. I have tried with many pairs without success, but once a "true pair" are discovered spawning is comparatively easy and can be repeated at frequent intervals. Quite a small tank will suffice for the spawning but fry would need to be moved to larger growing on quarters when approximately ¼ in. in size. I invariably use a 24 in. by 8 in. by 8 in. angle-iron tank filled to a depth of 5 to 6 in. with soft, slightly acid water. A temperature of 80° to 82°F (27°-28°C) is maintained during breeding. Before introducing the pair to the tank a bottom layer of peat moss is added to form a dark bottom; the breeders seem to prefer this and later it supplies a hiding place for the tiny fry, which can be seen hopping about like minute fleas before they reach the free-swimming stage.

The numbers of a brood will vary according to the size and condition of the breeders but the average is within the region of 80 to 100. The usual method of feeding applies, namely, Infusoria, brine shrimp, microworm, followed later by finely sifted dried foods and Grindal worms or chopped white worms. Growth is slow in the first stages, but once the babies are taking dried foods and white worms rapid progress is noted. A tank containing a brood of these attractive, perky little fishes of a size ¼ to ½ in. is a wonderful sight and makes the attempt at breeding the rosy tetra worthwhile.

Stocking Your Community Tank

by JOHN GRAHAM

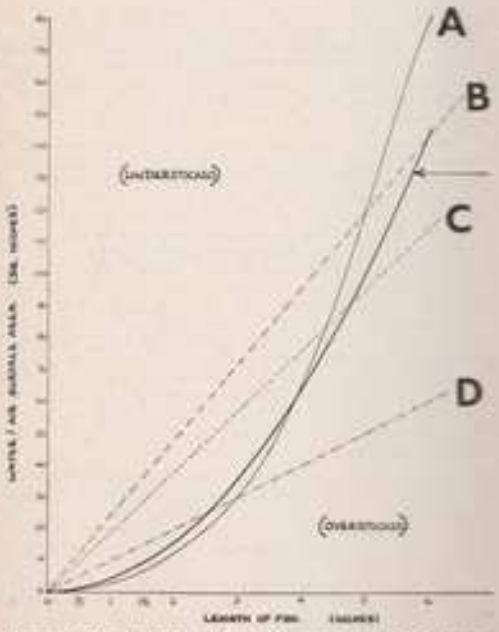
YOU'VE just been persuaded, after a visit to see your friend's tropical fish, to start your own community tank. You've set up the tank, aged the water, started a few plants and even had a trial couple of swordtails in the tank for a week during the last fiddling with the thermostat and they flourished—so now you're ready to get some fish.

How many can you have in your tank? Look up the leaflet your friend gave you. Ah! Yes, well that's clear enough: 1 inch of fish per 24 square inches of water/air surface. Well, let's see, that's 12 inches of fish in your 24 in. by 12 in. by 15 in. tank. So you can prepare a list of the fishes you want.

Now let's look through the book with the colour plates and choose. Look!—there's a bit here on stocking too—1 inch of fish per gallon! Let's see . . . that's 15 inches! Somewhere you've got another 3 inches of fish to go in already. Jolly good!

But now the doubt creeps in—one recommendation is based on water/air surface area per length of fish and the other on the water volume per length of fish. They can't both be right, can they? Look up *The Aquarist*—back copies from friend. Let's see . . . Answers to Tropical Aquarium Queries . . . 'you can afford 20 pairs of 1½-2½ inch fish in your 36 in. tank'. Hold on!—that's about 55 inches of fish in your size tank!

By now, of course, your book with the colour plates has persuaded you that you want to keep at least a pair of about 25 different species, while your handbook has gruesomely told you of the dangers of overcrowding in a community tank. What do you do? Well, I hope I've caught you in time! The answer is to read the rest of this article!



Allowance for water/air surface for young tropical fishes at 75°F (24°C) kept without artificial aeration (for details see text)

Air/Water Surface

The stocking of your community tank, apart from the obvious need for compatible fishes, depends on the ability of the fishes to obtain oxygen from that dissolved in the water and on the fact that more oxygen is dissolved, to make up this loss, at the air/water surface.

The amount of oxygen that a fish consumes is roughly proportional to its bodily size, and by this I mean volume rather than length, so that we can expect a small fish to need less oxygen than a larger one. Also we expect an inch-long neon to use less oxygen than 1 inch of a 3 inch swordtail, because of the differences in thickness of the fish in each case.

Thus our 1 inch neon can be expected to need far less water/air surface than our 3 inch swordtail both because it is shorter and because it is thinner, and the first recommendation we came across seems wrong because we are led to ask how thick should the inch be! The second recommendation seems wrong because it has no reference to the amount of water/air surface there is, and doesn't seem to care whether we have air or an airtight lid above the tank water (although the fishes might!).

The most authoritative data available to me were those published by Axelrod *et al.* in *Exotic Tropical Fish*, and these when plotted for different sizes of fishes gave curve A in the graph. Let's see how these rules of thumb compare with the research data.

Safe Allowances

The 1 inch per 24 square inches rule is a proportional recommendation and gives the upper straight line (B). You will notice that this very much overestimates how much surface area a small fish needs, while above 5 inches in length it underestimates the amount required, by quite a large amount. The 1 inch per gallon line (C) has been plotted for a 24 in. by 12 in. by 15 in. tank and you can see that it has the same failings as curve B. In fact we might even follow the pattern and use another rule of thumb, which says 1 inch of fish per 10 square inches of water/air surface (D), and we would still have a safety margin if we did not expect to keep fish greater than 3 inches long.

Well that's all very well . . . but you can't be bothered to carry a graph around with you, so is there any easy rule which is more accurate than these previous rules, but still easy to work out. Yes, we're lucky, there is!

In fact, if we try to match the curve A, we find that it is

steeper than a square law but not quite so steep as a cube, implying that the fish needs an amount of oxygen which is nearer to being dependent on its cross-section than on its volume.

We find, trying to get a simple formula, that the following curve which depends on four times the square of the length of the fish, is a very good match for fish up to 4 inches in length and does give some safety margin on the underexacting side, while it is less wrong than the old recommendations for the longer fish over 5 inches. The new recommendation is shown as the curve in a bolder line and marked with an arrow.

Let's apply it to your tank: two swordtails, two harlequins, six neons, one catfish, one loach, two mollies, two platys, three guppies, two angels and one black widow, and that adds up to a total of 18 inches of fish. Far too much by our two original rules. Now by the new recommendation:

Nine	fish at	½ in.	require	$9 \times 4\ (\frac{1}{2})^2 = 9$	square inches
Four	„ „	½ in.	„	$4 \times 4\ (\frac{1}{2})^2 = 9$	„ „
Six	„ „	1 in.	„	$6 \times 4\ (1)^2 = 24$	„ „
Three	„ „	1½ in.	„	$3 \times 4\ (1\frac{1}{2})^2 = 27$	„ „

We have apparently used only 69 square inches of the water/air surface of the tank, which has 288 square inches, so it looks like we have a long way to go! No! Hold on, those fishes are all going to grow. Suppose they double in length? This means that each length will multiply by two, and the recommendation being based on a square rather that we will need four times as much water/air surface. So then you'll need 276 square inches, which is just about on. So we better leave well alone.

"On second thoughts—try the rock behind the plant"

So there is a new recommendation (and I propose we throw the other two right away):

The water/air surface area required for a fish =
$4 \times (\text{length of the fish})^2$

This applies for young healthy tropical fishes in a community tank at 75°F (24°C) without aeration, and it gives a reasonable safety margin for fish under 4 inches in length. This should apply to many beginners who have not yet assessed their own capability for divining when a tank is getting crowded.

Let's not hear any more about 1 inch of fish per . . . etc. If you want that much safety margin, we might as well say one fish per 48 in. tank and let's spoil the hobby.

Breeding and Keeping *Daphnia* in the House

by JOYCE H. PARTRIDGE

A NUMBER of articles have been published describing methods of breeding and keeping *Daphnia*. All of them require large drums, containers, or ponds in gardens, to which rain water and rotted vegetation or manure is added.

Many aquarists live in flats or houses with small gardens or no gardens at all. In these circumstances a means of breeding *Daphnia* without the use of large containers had to be devised.

I purchased a large bag of *Daphnia*, and from it selected the larger and plumper *Daphnia*, and placed about 50 of them in a plastic bucket of tap water (approximately 3 gallons) adding six drops of liquid fry food (egglayers) as a nutrient.

My husband, who is a laboratory technician, set up cultures of tap water plus various nutrients such as rotted lettuce, grass, manure, hard-boiled egg.

At the end of the first week all of the *Daphnia* in my husband's cultures were dead, but those in the fry food culture were doing well and breeding happily. I took out about 200 newly born *Daphnia* and fed them to my 2 week old penguin tetra fry. By the end of the following week the *Daphnia* were still healthy and producing large numbers of young. The culture is still in use 6 months later.

The method of breeding *Daphnia* in the house with egglayer fry food is extremely successful and it is recommended that it be carried out in this way.

Take a plastic bucket (3 gallons capacity). Fill it with tap water. Add six drops of the fry food from the tube. Place a number of *Daphnia* into the bucket.

The next day and each successive day add six drops of the fry food. From time to time add some green water. Every 5 or 6 weeks change about half the water in the bucket for fresh tap water. This keeps the culture from becoming foul. It should be noted that care should be taken when changing the water not to disturb the *Daphnia* unduly, as they tend to die if they are agitated.

To ensure that sufficient *Daphnia* are available, it may be advisable to have two cultures working, especially when the aquarist has a large number of fishes to feed.

My husband and I have 170 adult fishes ranging from mosquitos to cichlids and anything up to two hundred fry in various stages of growth, and find that the *Daphnia* culture is indispensable to our feeding programme of a balanced diet.

Not only does the breeding of *Daphnia* in the house mean that a supply of live food is always available; it also saves money for the aquarist whose only source of supply is the pet shop from which a small bag of dead or dying *Daphnia* will cost as much as a shilling.

A Dual-Purpose Aquarium Stand

by DAVID MARLBOROUGH

FOR one public exhibition at which the British Ichthyological Society had a display it was found necessary to make an aquarium stand supporting a 6-foot run of tanks. To keep costs down, it was also designed to be re-erected in a member's house for domestic use. These specifications demanded a stand which was: (a) capable of bearing loads in excess of 400 lbs. of water and equipment; (b) rigid, especially with the public jostling around the stand on display; (c) attractive both on display and in the home; (d) made in small sections, versatile in whole and in part, capable of easy erection and dismantling. The sections had each to be small enough to transport in small vehicles.

The B.I.S. Stand Committee rejected a welded stand out of hand. A suitable one could be made in any of the proprietary slotted-angle strips, but it was felt this would give a very 'utility' appearance, despite it answering the other specifications. It was agreed finally to make the stand from elements of a proprietary laboratory tube-system (Climpex by B. Harrison Co.).

The Climpex system uses proprietary clamps to fix tubes of 0.5 to 0.55 in. diameter in its constructions. The tubing used for the B.I.S. stand was ¾ in. gas barrel, a standard and cheap size with an outside diameter of 0.53 in. This is recommended by the maker of Climpex.

Erecting for Exhibition

The stand plans called for a horizontal run of 6 feet of different sized tanks, raised 4 feet above floor level for optimum public viewing of 12 inch-high aquaria. The standard width of tanks was 12 inches, which gave an allowance of 15 inches for the width of the stand—to allow for clamps, wires, back-settings etc. To make a stand of these dimensions 85 ft. of gas barrel was needed, cut into four 6 ft. lengths, eight 4 ft. lengths, two 4 ft. 3 in. lengths and 15 lengths each 1 ft. 3 in.

The 6 ft. and 4 ft. lengths were clamped into two identical 'front elevations' (see diagram), and these skeletons were joined by the 15 in. cross-pieces. Three such cross-pieces were put along the base, and the rest along the top to support the run of tanks. With larger tanks, more cross-pieces can be used within the frame for bracing, rather than along the top for load-bearing. As a final measure, the two 4 ft. 3 in. lengths were clamped diagonally between the front and rear elevations, making the whole totally rigid.

For the exhibition, the stand required only 'feet' to prevent the vertical 4 ft. elements from marking the floor, and two points on the rear elevation for screwing it into the woodwork of the display with P.K. screws.

The clamps needed for the structure were: (a) 42 fixed right-angle clamps (Climpex no. 55A); (b) four swivel right-angle clamps for attaching diagonal bracers to horizontals or uprights (Climpex no. 55B); (c) six clamps with flanges and screw-holes, for use as 'feet' and for points for woodwork attachment (Climpex no. 55c).

Erection for Domestic Use

The principles of erecting the tubular framework are the same as before, except that space is saved by erecting it vertically. That is, it is now 6 ft. high and 4 ft. wide, and as such can stand in a convenient alcove or space, giving a four-tier construction.

All that is necessary to effect the change is to place the flanged-clamp 'feet' on the bases of the now 6 ft. verticals, to clamp the 15 in. cross-bracers on the 4 ft. horizontals (this making them into load-bearing shelves), and to place the diagonal bracers at the sides of the construction, so that they do not interfere with access to tanks placed within the framework.

With extra gas barrel one can add as many 4 ft.-long tiers as the number of tanks requires, cross-bracers being added as needed. Wooden shelving laid on these will give

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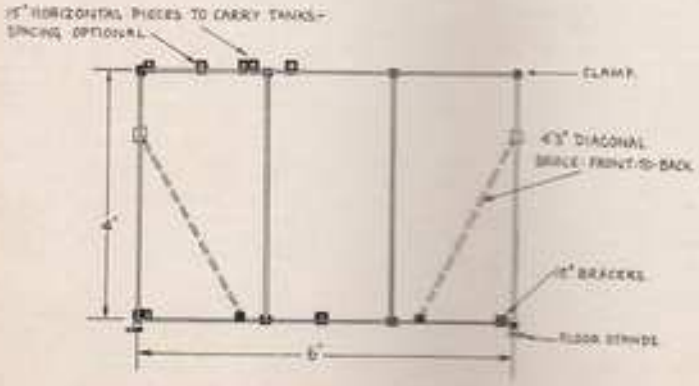
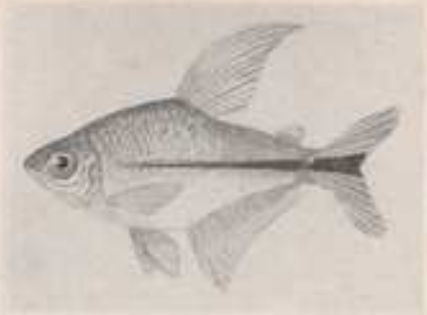


Moenkhausia pittieri

by JACK HEMS



THIS 2½–2¾ in. member of the family Characidae, which is popularly referred to by some writers as the diamond tetra, is native to a rather restricted area of Venezuela (Lake Valencia), and has been known to tropical fish-keepers in this country and the U.S.A. for at least a quarter of a century. That it is not more popular than it is at the present time is hard to understand; for it is a beautifully coloured, active and peaceful fish that will flourish in any roomy tank filled with soft, acid water and maintained at a temperature in the neighbourhood of 75°F (24°C) with a range of about 7°F either way.

The small-scaled body is elongated diamond-shaped, considerably compressed, and predominantly brassy yellow with green and gold reflections on the head and sides and a delicate blue to violet sheen on the basically silvery belly. A longitudinal stripe of steely blue sometimes shows quite clearly on the flanks and extends to the bifurcation of the caudal fin. This fin, and the dorsal, anal and ventral fins are suffused with blue to violet that varies in intensity according to the fish's mood, and pales to white at the tips and along some of the edges. The pectoral fins are clear. The large black eyes are surmounted with rims of metallic red.

Telling the sexes apart is quite easy; apart from the more pronounced colours and sturdier build of the female, the dorsal fin of the male is extraordinarily well developed and arches high over the back in a splendid scimitar-curve. His anal fin, too, is of larger-than-usual proportions.

The feeding of *M. pittieri* is no problem at all because it will eat dried or live food with almost equal relish. All the same, live food, or substitutes for live food, such as scraped raw meat, should be provided as often as possible to maintain the fish—an essentially carnivorous species—in radiant health. *M. pittieri*, like its better-known and larger-growing relative called the glass tetra (*M. oligolepis*), has a partiality for certain vegetable matter, and is especially fond of nibbling at such plants as nitella, which is really a higher algae, and duckweed.

The species can be spawned without much difficulty in a well-lighted and spacious tank, but the fry are not among the easiest of baby fishes for the breeder with little experience to manage, because they are readily susceptible to changes in temperature, and for the first few days of their lives they need copious quantities of the tiniest live food (freshly cultured Infusoria). Then, as they begin to make headway, they need frequent feedings of micro worms, brine shrimps, sifted Daphnia, tiny gnat larvae and the like until they develop more catholic tastes and can go on to more varied fare.

The spawning procedure is typical of the smaller characins we know well. That is to say, after some chasing around the aquarium, the pair get together in dense plant life growing at or near the bottom and there deposit some eggs. This performance may be repeated several times before the chasing eases off, whereupon the spawned-out fish should be removed from the aquarium before they get a chance to eat the eggs.

At a temperature of 78°F (25°C), the fry hatch out in a matter of 2 or 3 days, and a day or two later become free-swimming. As there are usually a lot of them (at the start, anyway), the provision of gentle artificial aeration promotes rapid growth. Young *M. pittieri* are more silvery than brassy in coloration, and it is not until they are a few months old that the males begin to develop their distinctive dorsal and anal fins. According to the frequency of feeding, and the quality of the food they are given, combined with the swimming space at their disposal, both sexes attain full size and colour in from 6 months to a year.

A Dual-Purpose Aquarium Stand

continued from the facing page

storage space for accessories (pumps etc.) or books, as well as aquaria. The structure described can accommodate five tiers of 12 in.-high aquaria with allowance for top clearance.

If one arranges the heaviest tanks near the floor, and the lightest articles on the topmost tier, the structure will be quite strong in use to obviate any attachment to the wall behind—an important point in domestic situations.

The tools needed for all this work are few—a steel rule, hacksaw and file for cutting and cleaning the lengths, a screwdriver for tightening the clamps. Thumbscrews are available on the clamps as an optional extra. B.I.S. experience has been that assembly or dismantling in either position takes two men well under an hour, given the cut lengths. Measuring and cutting takes scarcely as long even with a single pair of hands.

Gas barrel (or Climpex's own tubes) can be bought in a variety of finishes, making the structure corrosion-proof and smart. For economy, unplated tubing can be painted with aluminium paint. Whatever the finish, the end result does not look out of place in exhibition hall, laboratory or domestic room.

This method of constructing aquarium stands is versatile, and is applicable to a wide variety of uses, scientific or amateur. Amateur aquarists or animal technicians may find this account might solve similar problems they experience.

I would like to thank B.I.S. members for their help in its use, Mr. G. E. Marlborough for his assistance in its construction and erection, and Mr. B. Harrison of Climpex for the supply of clamps and his invaluable advice. So far this stand has been to two exhibitions besides its domestic/fish-house role, and its success is largely due to these gentlemen's efforts.

Observations on the Simpson Swordtail

by JOHN HAYNES

TOWARDS the latter half of 1961 I was lucky enough to have some Simpson swordtails brought over for me from America. These fish had, at that time, been reported in American journals but, to the best of my knowledge, no live specimens had been seen in this country.

The specimens that I obtained were of the Tuxedo variety, with red bodies and black finnage. There were two females and one male. The overall size was 1-1½ inches body length, which for adult fish was on the small side. Fin coloration, although appearing black, was not the rich dense black one usually associates with the black-finned varieties of swordtail.

My first thought on obtaining these specimens was to increase my stock by breeding. A glance at the females suggested that very small broods would be obtained and it was decided to mate the male with a large virgin all-red female of the common swordtail variety. This latter strain of fish had been in my collection for some time and members of this strain had collected many cards in club and open shows. By adopting this line of breeding it was hoped that large broods would be obtained and also some body size would be bred into the progeny. A more detailed account of the breeding experiments will be given later.

Before continuing I would like to point out that the only outward difference of a Simpson swordtail lies in the extension in the rays of the dorsal fin. Ray counts have shown that on average the actual number of rays in the dorsal is the same as in the common swordtail but that certain of the rays are extended. An actual ray count, with the length of the extended rays given in multiples of the shortest ray, is given in Table 1. This structure of rays produces the long flowing dorsal which can extend the fin to well beyond the caudal peduncle in the relaxed position.

Table 1

Ray number	Length	Remarks
1	1.0	—
2	2.4	—
3	4.4	—
4	3.8	B*
5	4.4	B
6	3.8	B
7	3.8	B
8	3.8	—
9	3.8	—
10	3.6	—
11	3.2	B
12	2.8	B

*B denotes branching

Reverting for one moment to the coloration of the dorsal fin; the results of the breeding produced some Simpson swordtails with red finnage and here again the coloration was not as dense as in the common all-red swordtail. My argument for this lack of intensity of colour is as follows. The dorsal fin in the Simpson swordtail has a surface area several times greater than the dorsal of a common swordtail. Assume that the number of pigment cells in the dorsal fins of both types of fish is the same. Then it follows that in the Simpson swordtail there must be a dilution of colour in the dorsal as the pigment cells will be spread over a much wider area and will therefore not show up as intensely as in the smaller dorsal of the common swordtail. It must be stated that all the other fins were comparable in coloration with those of the common swordtail.

Breeding was carried out as systematically as possible and careful notes were taken of the broods obtained and the various cross-breedings subsequently carried out. Before it was possible to breed from the original females both had died, although they were in the presence of the male for at least 3 months in my tanks. This led me to believe that the female of the species was sterile, although later breeding experiences did not support this idea. The only existing breeding records are therefore based on the cross between the original male Simpson swordtail and the common-type all-red female, remembering that the male had black finnage.

The first brood was born on the 8th January, 1962, and 51 fry were obtained. Two months later it was possible to select the various types and colours of fry and to divide them into separate tanks. Four types of fish were obtained as detailed in Table 2.

Table 2

Type	Description	Number in brood
A	High dorsal and black finnage	11
B	High dorsal and red finnage	17
C	Common dorsal and black finnage	12
D	Common dorsal and red finnage	11
	Total in brood	51

From this first brood it can be assumed that the high dorsal character of the male is not dominant to the common dorsal, there being roughly equal numbers of fish with high dorsals and those without. Secondly, the colour characteristic of the male was not dominant to that of the female as, once again, there are roughly equal numbers with black finnage and with red finnage.

It was now possible to select several pairs from the first brood for further breeding. Care was taken to separate the males from the females as soon as they were sexable and eventually to select only the best specimens.

The second series of selective breeding was aimed at confirming the initial conclusion about the lack of dominance of the high-fin character. This was carried out in two distinct crosses: (1) a male with two females from the first brood with like character, i.e. that of the original male with black finnage and high dorsal; (2) a male and a female of the first brood with all-red finnage and high dorsal.

Results of these breeding experiments are given in Table 3 for the cross involving all-black finnage and in Table 4 for the fish with all-red finnage.

Table 3

Type	Description	Number in brood
A	See Table 2	20
B		14
C		6
D		8
E	Green body, high dorsal and black finnage	6
F	Green body, high dorsal and green finnage	3
G	Green body, common dorsal and black finnage	5
H	Yellow body and finnage with common dorsal	1
	Total in brood	63

Table 3 shows a ratio of 2:1 for high dorsal to common dorsal, and, as far as coloration is concerned, roughly equal numbers having the original male's black finnage and with self-coloured finnage. Thus a ratio of only 2:1 for the high fins does further suggest that this character is not dominant, as if it were the ratio should have been in the order of 3:1. The advent of the green and yellow coloration was discounted in further breeding experiments.

Table 4 gives a ratio of 2:1 for high dorsal to common dorsal. Coloration gives a ratio of 2:1 for self-coloured finnage to black finnage. It must be remembered that the parents of this brood had all-red finnage and so this coloration might have a slight dominance in the fry.

Further breeding gave similar results to the foregoing and it was never possible to obtain a ratio higher than 2:1 for the high-finned fish. From these results it would seem that the high-fin character has never been a dominant feature in the make-up of these fish and one has to be content with breeding only 60 per cent of high fins in every brood.

Reverting to the general standard of the fish bred: the largest fish that I obtained from these broods was an all-red high-fin female which attained a body size of approximately 2 inches. The males never developed any appreciable size and were rather poorly shaped swordtails. From the point of view of colour, apart from the lack of colour in the dorsal, most fish carried a major fault in coloration—that of a silvery underside.

As show fish it would appear that the Simpson swordtail has little to offer over the common varieties. The only success I had in shows with these fish was a first award in an open show in May 1962, in the livebearer breeders' class. Single entry fish in a swordtail class never achieve high honours and I do not think that many do get into the cards, mainly because of small body size, silvery undersides and lack of colour in the dorsal fin.

Table 4

Type	Description	Number in brood
B	See Table 2	20
D		10
E	See Table 3	7
G		8
J	Yellow body and finnage with high dorsal	3
	Total in brood	48

Shedding some Light on Aquarium Plants

by K. N. PULESTON

MUCH has been written and discussed in recent years on the effects of various types of artificial lighting on aquarium plants. The following account of experiments are the author's personal conclusions, and while the results may not be accurate for all aquarists and conditions, they were undertaken with standard equipment, using matured London tap water, and plants purchased from various shops in the area.

In the first instance, a small 24 in. by 12 in. by 12 in. tank was set up, using well-washed lime-free gravel only, no peat or other compost being used during all the experiments. An undergravel filter was installed at the same time, and a standard all-over hood fitted with two 40 watt lamps was incorporated to supply the lighting. The tank was then liberally planted with a good selection of readily available plants, and later the fishes were introduced. All went well for several months, and although the fishes thrived and multiplied, the plants gradually lost that fresh green look, and growth slowed down. Following the advice of

Maintenance of healthy plant growth in a tank such as this necessitates correct lighting

several different aquarium publications, and noting that no algae of any quantity had formed, the lamps were exchanged for two 60 watt bulbs.

Little change was apparent in the effect on the plants, but another problem arose. As the tank was situated some distance from any daylight, it was necessary to leave the lamps on for 7 hours each day. It was found that, during summer time, the heat from the lamps raised the temperature of the water to 85°F (29°C), and during the night, the temperature fell to 73°F (23°C) before the thermostat cut in. Although no fishes were lost during this time, the black mollies looked decidedly uncomfortable, and it was then decided to try fluorescent tubes—which give a far higher light output to heat ratio than normal household tungsten lamps.

To anyone considering the installation of fluorescent lighting, several problems arise that can be overcome with a little patience. Firstly, the initial cost of the choke unit and tube is much higher than tungsten lamps. However, considering that once installed and used over many years, the saving in electricity and light bulbs can split even, if not gain in the long run. The next problem is the design of modern fluorescent units. These are now available from several manufacturers in ideal sizes for use in aquariums. One particular maker supplies tubes and units down to 6 inches in length, but 8, 12, 15 and 18 inch sizes can all be used, depending on the size and depth of the tank. However, in every case, the tube is held in a metal casing, which also houses the choke unit and starters, and as a fair amount of heat is given out by this component (and as it would be very unwise to fit this into the damp and humid conditions of the tank hood) some way of remote fitting must be found.

I found that by purchasing a length of eight-core cable, a neat method of outside fitting can be constructed. The metal case of the unit should be opened, and all the components removed except the lamp-holders. These components can then be mounted on a piece of wood or plastic, and the cables from the various parts rewired by using the colour codes of each wire in the eight-core cable. Most units will require only seven of the conductors, and the eighth can and should be used to 'earth' the tank. The empty metal casing can then be mounted into the tank hood, and the tube fitted into the lamp holders. Consult an electrician if you are not absolutely sure that your connections are correct, as faulty wiring can cause self-destruction of the choke unit, as well as providing an electrified aquarium.

The tank was allowed 3 months with the fluorescent tube providing the sole light source. New plants were introduced to replace those which had died, and they were occasionally fed with a tablet form of plant food made specially for aquarium use. The plants, however, began to deteriorate rapidly, and when the tube was exchanged for a "de-luxe warm-white" only slight improvement was apparent. It appeared from this that the plants missed the reddish light and infra red radiation that tungsten lamps supplied, which fluorescent lighting almost completely lacks. The "de-luxe warm-white" type of lamp contains the most red radiation of normal fluorescent tubes, and closely resembles the warmish light of domestic lamps, but still it did not contain sufficient to maintain healthy growth.

At this time, a new type of tube became available called the Gro-Lux tube. One of these was obtained, and the results can only be described as startling. Nearly all the plants began to grow extremely quickly, even the dwarf *Cryptocoryne* sending out new leaves and shoots in abundance. However, green algae developed just as rapidly, and needed constant removal to prevent the choking of the plants. Leaves of the plants, although appearing larger, became a little distorted and malformed. The colour of these tubes is of pinkish-violet hue, and transforms the colours of some fishes, so that although the renderings are not accurate, they are certainly very beautiful.

I am of the opinion that the Gro-Lux tubes, although fulfilling their advertised virtues, do their job rather too well. Algae become the main problem after a very short time, and probably the average aquarist will not like the idea of disturbing the plants at least once a week. Perhaps the tubes would be of better design if the light output were not so powerful, and it was found that far better and undistorted growth resulted from using an 18 inch Gro-Lux tube together with a 60 watt tungsten strip-light. The latter combination is one of two arrangements that can be recommended from the experiments.

Because of the algae problem, the Gro-Lux tube was discarded, and the tank was then fitted with one 20 watt fluorescent tube, and a 30 watt tungsten strip light. This combination has proved the most successful out of all installations, remembering, of course, that the water, gravel and plants have remained of the same quality and type during each period. The plants are growing with such energy and lushness that, for the first time in keeping fishes, it has been necessary to thin out and remove plants to prevent overcrowding. Algae are only produced in small amounts on the glass, and are of the soft types which the fishes devour when scraped off.

In conclusion, there are a few points of interest that have been discovered as by-products of the above experiments, which may be of interest to aquarists interested in growing plants in abundance.

One tank developed an outbreak of white-spot disease which was rapidly cured with a well-known aquarium remedy in the form of a powder. Several weeks later, blue-green algae formed together with blanket weed, and was cured not so rapidly with a tablet form algae killer. It appeared that the residual chemicals left from both applications combined to form a solution that malformed the growth of many plants, producing very small leaves of an insipid green colour, that died and fell off without completely killing the host plant. It did kill, however, a splendid and healthy backdrop of twisted *Vallisneria*, but had no effect on slow-growing plants.

Another by-product concerning *Elodea* became apparent. When the water was reasonably new, *Elodea* thrived and grew faster and thicker than any other plant. As the water matured, the *Elodea* began to deteriorate, becoming thin and spindly. It appeared that whilst the water contained salts and was termed 'hard', the plant grew well, but that the 'hardness' was quickly absorbed by the *Elodea*, and then the rot began to set in. Whether the hardness of the water actually has some bearing on the growth rate of *Elodea* is something that these experiments did not prove—but the results described certainly suggest this may be the case. For those aquarists who grow *Elodea*, a small quantity of water changed occasionally may increase the density and growth rate if at present the plant looks unhealthy.

Lastly, the effect of the undergravel filter during the experiments. I now operate the filter only during the dark or night hours. If the filter was run continuously, the plants tended to 'flag' a little, and if not run at all, the accumulation of 'mulm' had to be siphoned away. The happy medium seems night running only, for best results.

Again, it should be noted that the results and conclusions described as the most effective in the above account apply only to my set-up (which is relatively 'standard'), but at least may be of some guidance to enterprising aquarists who are not being very successful with their aquarium vegetation, and would like to alter the situation by varying lighting conditions.

Facing the Big Freeze-up

by H. J. GILBERT

FROM the time I built my first pond I have suffered, in the company of all other pond-keepers, the annual onslaught each autumn of all the well-meaning people in aquarist journals, gardening periodicals, women's weeklies as well as do-it-yourself books on what to do with your pond now that winter is around the corner. We are exhorted to remove all the dead and dying vegetation, if possible drain and clean out the pool (in one case check-weigh the fish) and feed only live food sparingly afterwards. Then, arming ourselves with pieces of timber, rubber balls, brace and bits, cans to contain boiling water etc., we can sit back ready to take action to prevent disaster when the pool freezes over. This is all very well, but I never see my pond in daylight in winter except at weekends.

On the subject of pools icing over there hasn't been any original thinking for years, at least not until an article appeared in *The Aquarist* of July, 1964, on how the local people are beating the "winter kill" in a lake in British Columbia and also in Russia, by causing the warmer and lower levels of water to circulate by means of compressed air and so melt holes in the covering of ice. I have since read that the experiment has been repeated with some success in the Arctic Sea ice. I realise, of course, that their problems are not ours, but it did seem to me to hold the germ of an idea with regard to our pond problems in winter.

Naturally I looked into the idea with my own set-up in mind. This is an irregular shaped pond, roughly 13 ft. by 8 ft. by 2 ft. deep, with sloping sides, an outlet pipe to a pump beneath the rockery feeding a fountain and small pond on top, which in turn feeds a series of 'falls' descending to the larger pond once again.

Although every year I set out to carry out the advice of the experts I always come unstuck somewhere, usually because of the time and weather factor. Always the pond was frozen over to an extent that necessitated drastic treatment to relieve it.

Circulating Pump

It seemed to me that this idea of compressed air circulating the water would do the trick. Naturally I did not want the complications in the British Columbia experiments of a windmill-driven compressor, or indeed the quantity of air they required.

As the small pump house under the rockery is permanently wired for electricity the logical idea was to use a small spare aerator of the vibrator type normally used in my fish house for the 'tropicals'. A spare shelf over the permanent water pump mounting was a suitable position and it was an easy job to provide a suitable point for a plug.

Ordinary aerator tubing was used to run from the aerator through a hole drilled in the door post (so that the door could remain closed and frostproof), along the path, round the rockery and into the pond, terminating in an ordinary diffuser stone. The stone had to be weighted to keep it on the bottom of the pond and in position. In operation a terrific stream of bubbles resulted, causing too much disturbance to the water, so branch lines and two further diffusers were incorporated. A certain amount of difficulty was experienced in equalising the flow of each diffuser as the relative depth of each one had to be taken into account. Eventually, an additional lead weight was attached to each diffuser stone to ensure that it was kept in the correct position. Weights also proved necessary to keep the air-line submerged through the length of the pond.

Mr. Gilbert's family are seen standing on the surface of his pond to demonstrate how completely it had frozen before the experiment.

A prolonged test of several days at this stage proved that the bubbles from the diffusers were too fine and were indeed liable to be interrupted by the mulm and other obstructions. Therefore the diffusers were removed and ordinary aerator tubing clamps fixed near the end of the tube and then adjusted until equal streams of comparatively large bubbles were obtained from each outlet. The importance and advantages of multiple outlets was proved at this stage; if one or more becomes inoperative for any reason it will result in an increased air flow at the other outlets.

A fairly long spell of cold weather at this stage exposed another snag. After a period of continuous operation a certain amount of condensation formed in the tube where it lay on the concrete path. It froze and the whole experiment failed. An attempt to provide some insulation was made by running the air tube through a length of plastic garden hose. This was only partially successful so I looked round for something else. Eventually I hit on the idea which has proved completely successful up to date.

It has always been my practice to disconnect and remove

the water pump each winter for cleaning and general servicing. The water-inlet pipe from the pond has to be disconnected and the end raised above pond water level to prevent the pump-house being flooded. The fitting of a tap or cock would have rendered all this unnecessary but I have never got around to fitting one, and this omission was now an advantage.

Having first removed the filter from the pond end of the line I was able to thread the aerator tubing through it into the pump house. Naturally it was necessary to plug the end of the tubing to prevent it filling with water. This plug was shaped so that its projecting end acted as a nose-piece whilst the tubing was being pushed through the water pipe. Once the connection was made to the aerator the whole system was below ground and therefore frost-proof. It has worked very well ever since, keeping reasonable areas of the pond ice-free in the most extreme weather. I made one further modification by the installation of a car sump heater in the pump house so that the air forced through to the pond was slightly warm.

This experiment does not seem to have adversely affected the fish or plants. Indeed they all survived the winter in a very healthy condition. As the pond was not thoroughly cleared of dead and decaying vegetation in the autumn it is probable there would have been a few 'fishy' casualties by the end of the winter because of the big freeze-up.

No doubt a lot of pond owners will say this experiment is not worth the trouble, but quite apart from the original idea of preventing 'icing up' the agitation in the water caused by the air bubbles gives the impression of a spring welling up and takes the place of the tinkling waterfalls in summer. Should I ever have occasion to construct another pond I will most certainly make provision for a permanent air inlet into it, with, of course, a more powerful compressor.

During a period of prolonged frost and snow the pond surface was kept open at one corner by the use of the pump

Corydoras paleatus

by LEBISTES

FOR quite a while this engaging catfish seemed to vanish from the market, so taken up were hobbyists with the newer and more attractively marked and/or coloured members of its genus. But now the paleatus or peppered catfish, or pepperred corydoras, is around again. And a good thing this is, too, for very few tropicals we keep in our tanks have such a plethora of desirable qualities.

For one thing, it will live for many years and never bother any other species, even guppy fry. For another thing, it will endure a gradual drop in the temperature to the low sixties (°F) without going off its food or falling prey to disease. Furthermore, it can live in quite foul water for a time, or even survive out of water for a time (provided its body is kept moist), without showing any signs of discomfort. This is because its internal construction is specially adapted for taking in oxygen from the atmosphere. In fact, even in well-aerated water, the fish often hurries to the surface for a gulp of air. The male attains about 2½ ins. in length, the female slightly longer. She is also the rounder and fuller-sided of the two.

The species is native to south-eastern Brazil and La Plata. The body is almost covered by overlapping, bony plates. The general coloration is a sort of muddled marbling of black, brown, blue-green and beige on a yellowish green ground overlaid in parts with silver and touches of gold. In addition there are numerous black spots. These adorn both the body and the fins. The eyes are like polished jet rimmed with shining gold. As the eyes can be rolled or turned downwards in their sockets, the fish often seems to be giving a sly wink.

C. paleatus should never be expected to live on left-overs alone, because in a well-populated community tank very little food reaches the bottom. The proper thing to do is to introduce tiny pieces of lean meat, whiteworms, tubifex, or dried food into the tank just before the room in which it stands is left in darkness. For then *C. paleatus* will not go hungry. It searches the compost painstakingly for edible matter after dark. Although *C. paleatus* is so active at night, it does not hide itself away for long during the day. Every now and again it will emerge from its hiding place among the plants and shuffle about the floor like some aquatic hedgehog.

It has been bred in captivity times without number since it was first spawned in France nearly a hundred years ago. But breeding is not a performance that it indulges in regularly in captivity. The water must be of the right quality: rather hard and alkaline. The temperature just right—in the neighbourhood of 65°F (18°C); the bottom of the tank should be carpeted with rich brown mulm. The female deposits her sticky eggs on the sides of the aquarium, on broad-leaved plants, or on rockwork; or on all three, if they are available, at a single spawning. Before egg-laying begins, the spawning grounds are mouthed over (cleaned) by both sexes. After spawning is over, it is best to remove the parent fish to another tank in case they eat any of the eggs they come across in their nocturnal ramblings. The fry emerge in about 4 to 5 days, make straight for the mulm, and there start to feed almost right away on micro worms, minute particles of dried food, or anything else they can find.

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

Home Breeding in Moderation is Fun

WHAT a dismal and depressing picture A. Burch, (*The Aquarist*, September) painted for the fish-keeper who breeds some young fish at home. I, purely as an amateur, have been happily engaged all the summer in allowing pairs of fish to breed if they seemed so inclined.

I have not bred indiscriminately but have just watched my community tanks and if a pair seemed in good breeding condition I have enjoyed setting up a tank, following suggestions from a good tropical fish book, to produce the right conditions. I have been fortunate in each case to have a family, not excessive in number, from each pair.

True, only livebearers—guppies, black mollies, red and black platys, swordtails (red) and one pair of platy variatus which for some reason produced only one youngster!

All these young fish have given me the greatest joy and interest. I have learned many things I would not have known had I not put the fish to breed. I have learned how to feed them and have watched them grow into healthy specimens, shape and colour good and shining like jewels. There is something especially attractive about these little creatures emulating their parents at such an early age. The parents, if put to breed instead of being left in a community tank where the conditions are anything but right, fulfil their proper function and if my own fish are anything to go by look exceptionally healthy and are improved in colour and shape.

I have never at any time thought of selling my young fish and am only too ready to leave proper breeding to the experts, but it has given me great pleasure to present to my friends, who have not had any luck with breeding, some young fish which they have added to their own tank.

My son took some of these babies to his home in Newcastle. The fish were carried in a Thermos flask and after a 10 hours journey were in excellent condition. I do not let any of my fish go under 8 to 10 weeks old.

While agreeing with A. Burch in principle that fish should not be bred if the result is only to destroy them, the acquisition of new tanks and equipment is surely the true fish hobbyist's aim and should not alarm him at all.

As for the reference to disillusioned aquarists and those who have this interest stimulated, it surely speaks for itself that they are no longer aquarists.

Fish-keeping is a hobby for any home dwellers, and without interest there is no hobby. The fish specialists who offer all the latest equipment and guaranteed first-class fish and service have to do all the dirty work, like being ruthless with their stock. Long may they reign, because nobody enjoys pressing their nose to their windows more than I do to make mental notes of my next buy. But for the home dweller who loves his fish and equipment, great pleasure can be had from home breeding if entered into, in the right spirit. Lastly I would say that at no time should these baby fish, even if they appear to be perfect, be offered for sale at the prices charged by real stockists.

(Mrs.) V. K. SINDEN,
London, S.W.15.

Quartz Rocks

WHILST reading the Aquarists' Notebook (*The Aquarist*, December), I came across this completely false sentence: "Marble, quartz and similar calcium carbonate rocks are highly unsuitable etc." Marble is calcium carbonate and is undesirable in aquaria, but quartz is a form of silica (silicon dioxide), the most common form of which is sand, and is suitable for aquaria.

W. T. BALLOM,
Hemel Hempstead, Herts.

Ponds in Winter

HAVING had three ponds in my garden for over 30 years, may I add one or two points to Mr. Boarder's valuable article in the November issue?

Whilst I remove as much under-water foliage as possible from oxygenating plants, in addition to water-lily leaves, I do not cut down the dead rushes and other pondside plants until spring. In one corner I bend them over the water and cover them with a sack. It has to be a very severe frost before the water at this corner freezes.

I also find the heaters mentioned by Mr. Boarder very effective. No matter how keen the frost, they always keep a small area about as big as a saucer clear of ice, thus preventing the ponds from cracking. Whenever it snows on top of the ice I remove the snow as soon as possible, as I find that the water turns foul much more quickly when it is deprived of sunlight.

C. HARRIS,
Featherstone, Yorks.

Correspondence Invited

I AM a reader of your magazine. My hobby is aquaria, but unfortunately here in Greece it is very difficult to buy and find fishes, and also to find other hobbyists to change tropical fishes with them. Collecting tropical fishes is my beloved hobby and I am obliged in order to get them to wait for somebody coming from America, or from Africa. So I decided to write to your magazine, because I thought that you would know a lot of hobbyists who would like to get in touch with others in other

countries. If it is possible I would like to find someone who wants to correspond or change fishes with me.

PAUL ANTONOPOULOS,
Smolensky 6,
Neapolis, T. T. 706
Athens, Greece.

Dangers of Display

AQUARISTS sometimes query why the lay-out of equipment and new lines in pet shops and shops devoted to the hobby is often so poor. They complain that goods are crowded together and cannot be inspected at leisure. I can tell them why! In a fairly newly opened shop special attention was paid to display and full use made of shelving. Every item for sale was clearly visible and goods could be examined freely. More experienced fellow shopkeepers viewed the new arrangements somewhat cynically. "You'll lose the lot," they said. But we hoped. Then the petty pilfering started—small tubs of goldfish food, ornaments, live terrapins—mostly we thought due to small boys, some of whom were caught redhanded. But small boys can only reach the lower shelves, where the lower priced goods are kept. A long list of more expensive missing articles and books has culminated this week in the disappearance from a 6 ft.-high shelf of a piston pump costing over £5. We are awaiting the moment when a 3 ft. bow front set-up disappears from the shop. It will surely happen soon. A nation of shopkeepers or a nation of shoplifters?

DEALER (name and address supplied),
London.

Keeping Tubifex

THERE has always been a lot of argument concerning the keeping of *Tubifex*. Some say they can only keep the worms for 2 days, others say only 1 day, but I have found a very easy way of keeping them fresh and in good condition for as long as 6 weeks, which was when my stock ran out, and it would have still been alive had I had sufficient to last.

My method is to empty the *Tubifex* from its container in which I bought it from the pet shop, and give it a really good rinsing. This is done by using a flat plastic tray, approximately 10 ins. by 8 ins. by 1½ ins., of a type sometimes used by photographers for developing prints. I always rinse the worms three or four times in cold water before leaving them to settle down in a cool place. Then for about 3 days I rinse them night and morning, and from then on, I rinse them only once a day. The *Tubifex* will then be found to be perfectly clean with no unpleasant smell at all, as can be ascertained from the fact that I am allowed to keep my *Tubifex* on the pantry floor (it has to be free from smell for me to be allowed to keep it in my wife's special domain!).

In my opinion the most important item is the clear plastic tray, which must be no more than 1½ to 2 ins. deep, as the more air you get to the *Tubifex* the longer they live.

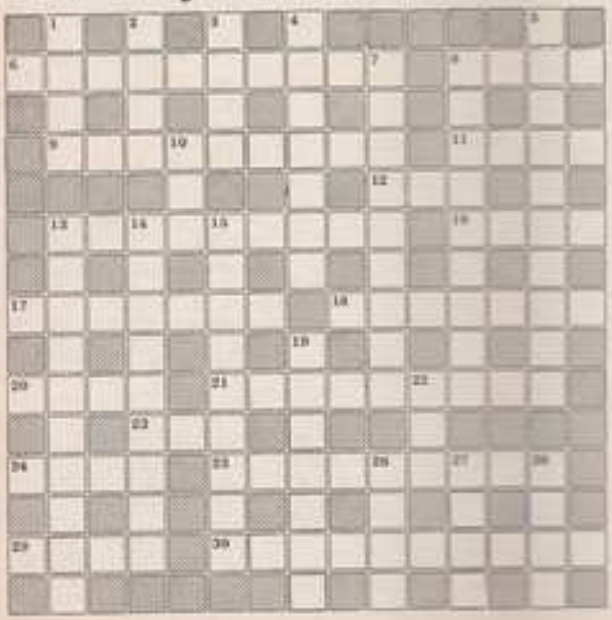
J. G. FALKINGHAM,
Bingley, Yorks.

Change of Editor

OWING to development of other professional commitments, Mr. Anthony Evans, Editor of *The Aquarist and Pondkeeper* since 1948, has resigned from the staff of this Journal. With the February issue, the editorship will be taken over by Mr. Laurence E. Perkins, whose name as a contributor of photographs and articles to these pages will be familiar to readers.

The AQUARIST Crossword

Compiled by L. BRADLEY



CLUES ACROSS

6. Arrow Worts (10).
8. It can easily be produced with a pin (4).
9. This tetra is *Hemigrammus erythrozonus* (8).
11. Return the animal to the pondside (4).
12. Historical period (3).
13. Not suitable for tropical fish (4, 5).
16. Position where one can sit facing east (4).
17. Is it unpleasant by the Strands? (7).
18. Associate (7).
20. Wading Bird (4).
21. Double cost of Planter (6-3).
23. Did he see red when the cakes burnt? (3).
24. Half (4).
25. Stray moon—perhaps known in this science (8).
29. Messenger of the Gods by the pondside? (4).
30. *Hyphessobrycon pulchripinnis* (5, 5).

CLUES DOWN

1. Suspend (4).
2. So I and fifty others are inside a store-pit (4).
3. Associate Trinity College (of Music), London (4).
4. The ship whose destiny rests around its furnishings (7).
5. Stoke on this (5, 5).
7. Lean tetra (anag.) (9).
8. Spur with a 16 across to give unwelcome aquarium visitors (9).
10. Stack of notes (3).
13. *Rhamnogrammus* interrogator (5, 4).
14. Musical fish? (9).
15. Comrade (8).
19. All out up Amy gets about N.A.T.O. (7).
22. Score in cricket (3).
26. Possesses (4).
27. Beasts of burden (4).
28. Cart back a spar on board the sailing ship (4).

Solution on page 187

News from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

As a result of a tie in the League matches between the three societies, Thorne, Goole and Hull, a "play-off" was arranged and this resulted in a win by Thorne A.S. The placings were: Thorne 30 points, Goole 15 points, Hull 13 points. The details were as follows:

Anabantids: 1, Mr. Candow (T); 2, Mr. R. Hann (G); 3, Mr. Marratt (G). Cichlids: 1, Mr. G. Jacobs (H); 2, Mr. G. Jacobs (H); 3, Mr. Chapman (T). Characins: 1, Mr. D. Watching (T); 2, Mr. Duffield (T); 3, Mr. E. Chapman (H). A.O.V.: 1, Mr. Candow (T); 2, Mr. Gregory (G); 3, Mr. Douglas (H). Livebearers: 1, Mr. Gray (T); 2, Mr. Chapman (T); 3, Mr. Hotrinson (H). Barbs: 1, Mr. Duffield (T); 2, Mr. Duffield (T); 3, Mr. A. Peacock (H). Cats, loaches: 1, Mr. Hanson (T); 2, Mr. Duffield (T); 3, Mr. A. Peacock (H). Rasboras, danios and minnows: 1, Mr. Matching (T); 2, Mr. Matching (T); 3, Mr. E. Chapman (H). Toothcarps (k.l.): 1, Mr. Hanson (G); 2, Mr. Wells (T); 3, Mr. Matching (T). Breeders registered: 1, Mr. D. Wells (T); 2, Mr. Candow (T); 3, Mr. P. Mackrill (G). Breeders livebearers: 1, Mr. Hanson (G); 2, Mr. D. Matching (T); 3, Mr. M. Lee (H). Fighters: 1, 2 and 3, Mr. Candow (T).

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Hull A.S., the promoters of the "play-off", have had a very active year and are looking forward to an extension of their activities this year. New members, adult and junior, will be assured of a warm welcome and should contact Mr. F. Storey, 141, College Grove, Preston Road, Hull.

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AT a recent meeting of the **Thurrock Aquarist Club** the chairman, Mr. R. Nicholls, gave an interesting and informative talk on "Fish Diseases". He pointed out many ways of preventing disease and many remedies. The talk was enjoyed by all club members.

Two table shows were held and the results were as follow:

Tuppers: 1, Mr. R. Nicholls; 2, Mr. S. Bunday; equal 3, Mr. D. Durrant and Mr. B. Barber. Class A.O.V. Tuppers: 1, Mr. P. Bunday; 2, Mr. R. Nicholls; 3, Mr. B. Tankard.

The club meets on alternate Monday evenings at Gypsy Lane Hall, Grays, at 8 p.m. New members always welcomed.

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THE **Bradford and District A.S.** recent table show results were as follow: Breeders class: 1, Mr. K. Emms; 2, Mr. C. Holdsworth; 3, Mr. T. R. Smith. A.O.V. class: 1, Master S. Butterfield; 2, Master S. Butterfield; 3, Mr. A. Gardner. Leading table show placings for guppies: Mr. C. Holdsworth 28, Mr. P. Greenwood 21, Mrs. M. Firth 20, Mr. T. R. Smith 17, Mr. A. W. Cripps 15, Mr. K. Emms 11, Mr. J. Hooper 11.

* * *

AT a November meeting of the **Cardiff A.S.** ten new members were present and a talk was given on "Breeding Siamese Fighting Fish" by Mr. P. Barnes, one of the more experienced members.

At the following meeting, the twice-yearly "Knockout Competition" was held and the results were as follow: 1, 2, and 3, Mr. G. Tucker. The Knockout Shield was donated by Mr. Lockwood and presented to Mr. Tucker by the chairman, Mr. J. Barnes. At this meeting an auction was held at which four tanks each 36 × 10 × 12 inches were sold to the Club members at very reasonable prices. These tanks were donated to the Society in appreciation of their efforts made in mounting a stand in the Cardiff Horticultural Show earlier this year.

The raffle at this meeting consisted of five prizes. A tank was won by Mr. Townsend, fish were won by Mr. Jenkins and Mr. Lambert, and fish food by Mr. D. Galligan. Three new members were present at this meeting.

The first annual dinner of the Club will be held at the Bristol Hotel, Penarth Road, Cardiff, on 26th February, price 18s. Any persons interested should write to the honorary secretary before 19th February.

Meetings are held on the second and fourth Thursday of each month at The Olde Arcade Inn, Church Street, Cardiff, commencing at 8 p.m. Visitors and new members will be most welcome and more details can be obtained from the hon. secretary, Mr. N. A. Counsell, 28, Llanmaes Road, Gabalfa, Cardiff.

* * *

TWO table shows were held at the meeting of the **Southend, Leigh and District A.S.** These were for the "Best Fish of the Year" trophy and the Breeders Cup, and the results were: Best Fish of Year: 1, C. Ward (anstilus barb); 2, V. C. Pickett (indian barb); 3, P. P. Capon (Siamese fighter); 4, Miss Bowerman (bleeding heart tetra). Breeders: 1, B. Dunn (viviparus); 2, B. Dunn (livebearer black mollies); 3, P. P. Capon (Siamese fighters); 4, P. P. Capon (female wags.). An informal fortnite was also given by the president, Mr. A. J. Mason, on "Queer Fish" and this was extended to cover rarer species, and species on present in short supply. The raffle, which is a regular feature of Club meetings, was won by C. Ward, the prize being a pair of Celebes rainbow fish. The Club meets every first and third Tuesday in the month at the Liberal Hall, Clarence Road, Southend-on-Sea. Clarence Road is close to Southend Central Station. Intending members will be welcomed at meetings, and further information can be obtained from the secretary, Mr. V. C. Pickett, 2, Whitehall Road, Great Wakering, Essex.

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THE **East Dulwich A.S.** recently held an inter-club show with Croydon A.S. The judge for the evening was Mr. G. Jessop and during the judging a quiz was held, at which Croydon were the winners and were presented with a book "Tropical Fish in the Aquarium." The table show results were as follow: Characins: 1, Mr. Blyth; 2, Mrs. Dyason; 3 and 4, Mr. Parker. Livebearers: 1, Mr. Sears; 2, Mr. Penny; 3, Mr. Open; 4, Mr. Orr. Barbs: 1, Mr. A. Gale; 2 and 4, Mr. Ayres; 3, Mr. Ayers.

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THE results of the table shows at the **Dunelm A.S.** meeting were as follow: Danios and tropical minnows: 1, B. Hill; 2, W. M. Lowdon; 3, B. Hill; 4, Miss E. Davidson. Dwarf cichlids: 1, S. Gauld; 2, A. L. Hastie; 3, A. Imich; 4, S. Gauld. The programme which followed included a talk on "Fish Ponds" by fellow-member W. S. Russell.

* * *

THE annual general meeting of the **Southend, Leigh and District A.S.** was held at the Liberal Hall recently. After the usual reports on the progress of the Society throughout the past year the officers for 1966 were elected, and these are as follow: President, A. J. Mason; vice-presidents, V. C. Pickett; secretary, M. J. Willis (17, Arundel Gardens, Westcliff); treasurer, D. M. Cheeseright; committee members, H. Preston, T. King, Mr. Baron, Mrs. W. Willis and P. P. Capon.

Suggestions were invited from the members present as to the programme for the following year. One criticism of the Club's activities was that little interest was shown in coldwater fish as most of the present members were more interested in tropicals.

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THE first annual general meeting of the **Worthing Tropical Fish Club** was held in December. Reports from Club officials showed that the position of the Club has strengthened considerably during the year, and from the humble beginnings last January, the membership has now risen to 35. Highlight of the evening was the drawing of the winning tickets in the Grand Christmas Draw competition. £13 profit was made from this draw, which will be put towards increasing club facilities during the coming year.

The Club recently suffered a severe loss through the death of one of the committee members, Mr. John McTaggart of Worthing.

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IN a recent instalment of the A.B.C. Television "Avengers" series, currently being screened in the London region, several scenes showed the interior of a film set public aquarium with some great close-ups of large tropical fishes. Many of these fishes were loaned by Mr. Bernie Bell, chairman of Clapham A.S., to the local firm who were contractors to set up the aquaria for the film, which was entitled "The Murder Market".

* * *

THE following change of officers has been reported from the **Tropical Aquarium Breeders**: Chairman, Mr. C. Walker; secretary, Miss C. Hamilton, 394, Green Western Street, Rusholme, Manchester 14; show secretary, Mr. S. Collinge.

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AT the annual general meeting of the **Wakefield and District A.S.** the following members were elected to serve during 1966: Chairman, Mr. G. Bosley; vice-chairman, Mr. A. Cotton; show secretary, Mr. D. English; treasurer, Mr. A. Bates; committee, Mr. F. Smith, Mrs. M. Turvey; secretary, Mr. C. Archer, 8, Lindale Mount, Alverthorpe, Wakefield.

At the Society dinner the following members were awarded the Club trophies for table shows throughout the year: A.O.V., Mr. G. Bosley; Specified, Mr. D. English. In addition, Mr. D. English was awarded the "Aquarist of the Year" trophy and Mr. G. Bosley received the Home Aquarium Cup.

In future the meetings will be held on the second Tuesday in each month at the Magnet Hotel, Dewsbury Road, Wakefield.

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THE second annual general meeting of the **Swindon and District New A.S.** was held on the 6th December. After the reading of the minutes and treasurer's report the chairman, Mr. R. A. Hoskins, gave a brief account of the Club activities during the past year, a year which had been very successful, including inter-club competitions, lectures and visits to the London Zoo Aquarium and British Aquarians' Festival.

Mr. Hoskins also stated that he did not wish to stand for re-election for the coming year as he felt that new faces on the committee would bring forth fresh ideas and that the Society in the long run, would benefit from the experience gained by other members in the running of the Society. Mr. R. A. Hague and Mr. J. Howes, secretary and treasurer respectively, endorsed the views expressed by Mr. Hoskins.

The officers elected for 1966 were: Chairman, Mr. A. Brewer; secretary, Mr. D. Ayres, 81, Abbey View Road, Moredon, Swindon, Wilts.; treasurer, Mr. J. Phillips; vice-chairman, Mr. R. A. Hoskins; show secretary, Mr. R. A. Hague; librarian, Mr. K. Martin; press secretary, Mr. A. Maddams.

THE annual general meeting of **Accrington and District A.S.** was held on the 8th December and the officers elected were as follow: Chairman, Mr. T. H. Bannister; vice-chairman, Mr. F. W. Hartley; treasurer, Mr. W. M. Smith; hon. secretary, Mr. Brian Tattersall, 42, Haywood Road, Accrington; hon. minute and press secretary, Mr. C. H. Whitney; committee, Mr. A. Isherwood, Mr. H. Smith and Mr. C. H. Whitney.

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THE show results of the **Fancy Guppy Association** held at the British Aquarists' Festival at Belle Vue were as follow: Best fish in show: V. Partington and F. Thomas. Best female: V. Partington. Best male: F. Thomas. Best breeders: V. Partington, Master breeders: H. Stannard. Best Lady Member: C. Kelly. Novice breeder: P. Davies. Fantails: 1, V. Partington; 2, A. Wallace; 3, Beresford and Jeffery. Delta: 1 and 3, Beresford and Jeffery; 2, V. Partington. Black veil: 1, R. DeGroot; 2, K. Rigby; 3, C. Kelly. Veil: 1 and 3, Beresford and Jeffery; 2, V. Partington. Flag: 1, R. DeGroot; 2, T. Hallett; 3, B. Tattersall. Top sword: 1, 2 and 3, Dr. Lasker. Lower sword: 1 and 2, T. Hallett; 3, A. Wallace. Double sword: 1, T. Hallett. Short tail: 1, J. Brownhill. Half black: 1, F. Thomas; 2, V. Partington. Colour: 1, V. Partington (Gold Jewelled Award); 2, T. Hallett; 3, B. Tattersall. A.O.V. male: 1, J. Brownhill; 2, V. Partington. Superba: 1, 2 and 3, V. Partington (Gold Jewelled Award). Scollop: 1, B. Hawkins; 2, Mrs. Kelly. Original: 1 and 2, Mrs. Kelly; 3, B. Hawkins. Wedge: 1, Mrs. Kelly; 2, A. Wallace; 3, H. Ludwig. A.O.V. female: 1, V. Partington; 2 and 3, Beresford and Jeffery. Master breeder: 1, H. Stannard (Silver Star); 2, V. Partington. Breeders males: 1, V. Partington (Gold Jewelled Award); 2, F. J. Thomas; 3, V. Partington. Breeders females: 1, F. Thomas; 2, V. Partington; 3, Beresford and Jaffery. Breeders pairs: 1, V. Partington (Gold Jewelled Award); 2, K. Willcock; 3, Berresford and Jeffery. Novice breeders: 1, Mrs. P. Davies. Ladies: 1 and 2, Mrs. C. Kelly; 3, Mrs. M. Spencer.

* * *

AT the November meeting of the **Nottingham and District A.S.** 36 members attended to hear Dr. Colls' talk on "The breeding of small egglayers," after which he judged the fish in the coldwater section of the table show. The results were as follow: Anabantids: 1 and 2, Mrs. J. Bulleyment; 3, Mr. G. Colton. Coldwater: 1 and 3, Mr. C. Hill; 2, Miss A. Goodliffe.

* * *

A TABLE show was held by **Portsmouth A.S.** for breeders classes and tropical and coldwater plants. The judge was Mr. D. Hancock from Reading. During the judging there was a very interesting discussion on the breeding of fish by Mr. Stillwell, Mr. Mawle, Mr. Warren and Mr. Franklin. The table show results were announced as follows: Breeders livebearers: 1, 2 and 3, Mr. P. Carlyon; 4, Mr. R. Warren. Breeders egglayers: 1, Mr. T. Stillwell; 2 and 3, Mr. N. Franklin; 4, Mr. W. Tyler. Rooted plants: 1, 2, 3 and 4, Mr. T. Stillwell. Plant runnings: 1, 2, 3 and 4, Mr. T. Stillwell.

The open show will be setting up on the 6th August, judging on the 7th, and open to the public from the 8th to the 13th.

* * *

THE **Hounslow and District A.S.** held their annual general meeting recently when the new officers for this year were elected as follow: Chairman, Mr. J. Thorne; secretary, Mr. D. Woodward; treasurer, Mr. R. Luff; show secretary, Mr. R. Scurry; press secretary, Mr. B. Bodi; librarian, Mr. R. Cook; public relations officer, Mr. H. Pratt; entertainments officer, Mr. H. Nathorne; floor members, Mr. Sheppard and Mr. Perry; auditors, Mr. T. Smith and Mr. R. Barber.

The Society has had a good year with attendances well above average. At a recent hour-club show with Feltham A.S. in connection with the A.S.L.A.S. knockout competition Hounslow A.S. won the round by 891 points to Feltham 878. The first three places of the show were won by Mr. Pratt (Hounslow A.S.) moonlight gourami, 80 points; 2, Mr. Thorne (Hounslow A.S.) dwarf gourami, 79 points; 3, Mr. Thomas (Feltham A.S.) Aphyosemion notatum, 773 points.

The Hounslow A.S. now meet at the Territorial Army Centre, Hanworth Road, Hounslow, and the secretary is Mr. D. Woodward, 19, Ellerslie Road, Hounslow, Middx.

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THE yearly trophies were presented at the annual general meeting of the **Pontefract and District A.S.**, the winners being as follows: 1, Mr. D. Colton; 2, Mr. P. Bratley; 3, Mr. K. Mortimer. The following officers were elected for the coming year: Chairman, Mr. K. Mortimer; vice-chairman, Mr. D. Colton; secretary, Mr. H. Copley; treasurer, Mr. T. Taylor; show secretary, Mrs. D. Colton; publicity officer, Mr. A. Town; committee, Mr. G. Copley, Mr. T. Turner, Mr. B. Mortimer, Mr. A. Fox.

The Society enjoyed a good year both financially and socially. In the coming year meetings will be held on the second Monday of every month, and plans are already being made for an inter-club and open show. A "Home Aquarium Competition" has also been included in the new syllabus. The Society welcomes visitors, and new members are invited to attend meetings which are held at The Carlton Snowdery Boys' Schools, Carlton, near Pontefract. Will anyone interested in joining the Society please write to the secretary, Mr. H. Copley, 14, Castle Vale, Knottingley Road, Pontefract.

* * *

THE committee of the **Warrington A.S.** would like to wish old and new members alike, a Happy and Prosperous New Year. Further information for new members may be obtained from the secretary: Mr. J. Higham, 42, Hood Lane, Sankey, Warrington.

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THE **Lyons Aquarists** were given a very interesting talk by Mr. D. Jones on the "Shore Life of Morecambe Bay." Mr. Jones has studied a section of Morecambe Bay for many years and is a well-known authority on marine life in the local pools of the Bay. He told members where to find various types of fish like the blennies, gobies, butterfish, starfish, etc. He also told them where to find anemones of various kinds. He explained the spawning methods of the fishes and crabs and their migratory habits and the particular months in the year when the fish are most prolific. Mr. Jones then told members how to set up their own collection marine tank with the different types of fish taken from the Bay, and said in his opinion that this was a lot simpler and cheaper than keeping tropicals. Mr. Jones brought along quite a number of preserved specimens to illustrate his talk and these created a lot of interest and discussion with the members.

The fish of the year show was judged by Mr. E. Smart with the following results: 1, J. Mills, green saddle mollie; 2, G. Ownby, checker barb; 3, G. Ownby, rosbonata.

* * *

AT the second annual open show of the **Tottenham and District A.S.**, the entry exceeded last year's total and over six hundred exhibits were on view to the general public. Mr. T. D. Smith's (Willesden) dwarf gourami was the best fish in show, taking the cup presented by Lansbury Aquatics. The fish also took the cup for the best egglaying species, presented by P. E. Child. The cup presented by Sterling Fisheries for the best of the fifty-seven breeders exams, went to Mr. L. Bromley (Bethnal Green) with his bettas. Mr. Greenhall (Kingston) took the best livebearer cup, also presented by Sterling Fisheries, with a betta swordtail, this fish being adjudged the best of 115 livebearers.

The results were as follows: Club furnished aquaria (15 entries): 1, East London Aquarists and Pondkeepers; 2 and 3, Walthamstow and District A.S.; 4, Chingford and District A.S. Individual furnished aquaria (18 entries): 1, Mr. A. Webb (Hendon); 2, Mrs. I. Nutt (Tottenham); 3, Mr. J. Stewart (London Transport); 4, Mr. R. M. Barber (Thurrock). Guppies: 1, E. R. Nicoll (Thurrock); 2, E. Sheppard (Hounslow); 3, J. C. Baines (Dunstable); 4, M. W. Smith (Thurrock). Fighters: 1, A. Webb (Hendon); 2, H. Champness (Bethnal Green); 3, J. C. Baines (Dunstable); 4, D. King (Tottenham). Toothcarps: 1, R. Giles (Independent); 2, T. D. Smith (Willesden); 3, L. Bromley (Bethnal Green); 4, Miss M. Hawes (Tottenham). Platies: 1, G. Aylard (Riverside); 2, A. Webb (Hendon); 3, R. Giles (Independent); 4, W. Wren (Bethnal Green). Mollies: 1, D. W. Ellis (Kingston); 2, F. Stone (Hampstead); 3, H. Champness (Bethnal Green); 4, R. Elsden (Tottenham). Swords: 1, G. E. Greenhall (Kingston); 2, W. Wren (Bethnal Green); 3, W. Barker (Tottenham); 4, W. Dean (Chingford). Danios: Rasboras, W.C.M.M.: 1, G. Bundle (Tottenham); 2, S. Mooney (Tottenham); 3, A. P. Barnes (Tottenham); 4, R. Elsden (Tottenham). Corydoras: 1, R. Clarke (Tottenham); 2, D. Durrant (Thurrock); 3, R. Cooper (Kingston); 4, D. W. Ellis (Kingston). Dwarf cichlids: 1, W. Wren (Bethnal Green); 2, D. Burrell (Enfield); 3, E. R. Nicoll (Thurrock); 4, K. Oliver (Harlow). A.O.V. labyrinth: 1, T. D. Smith (Willesden); 2, W. Collins (Walthamstow); 3, W. Wren (Bethnal Green); 4, S. Mooney (Tottenham). Characins: 1 and 2, L. F. Clements (Tottenham); 3, D. W. Ellis (Kingston); 4, T. D. Smith (Willesden). Barbs: 1, R. Clarke (Tottenham); 2, J. H. Soanes (Harlow); 3, Miss M. Hawes (Tottenham); 4, L. F. Clements (Tottenham). A.O.V. catfish: 1, D. Ellis (Kingston); 2, G. Greenhalf (Kingston); 3, R. Giles (Independent); 4, S. Mooney (Tottenham). Cichlids: 1, P. Lobb (Tottenham); 2, R. Thorne (Hounslow); 3, S. Potter (Hampstead); 4, E. R. Nicoll (Thurrock). A.O.V.: 1, C. Ford; 2, G. Greenhalf (Kingston); 3, B. Baker (Uxbridge); 4, W. Collins (Walthamstow). Egglayers breeders (above 14 points difficulty of breeding): 1, R. A. Keeping; 2, R. Elsden (Tottenham); 3, E. W. Bartlett (Chingford); 4, E. W. Bartlett (Chingford). Egglayers breeder (14 points and below difficulty of breeding): 1, L. Bromley (Bethnal Green); 2, E. W. Bartlett (Chingford); 3, W. Barker (Tottenham); 4, R. Elsden (Tottenham). Livebearer breeders: 1, 2 and 3, B. Baker (Uxbridge); 4, J. Stewart (London Transport). Children's furnished aquaria: 1, Miss P. Barnes; 2, Miss M. Nutt; 3, Master R. Welch; 4, Master M. Tanchen; highly commended, Master Edery.

* * *

NEW SOCIETIES

FROM Knutsford, Cheshire, we hear of a proposed new society in the district. The response to enquiries has been quite good and interested readers are requested to contact Mr. T. H. Hurd, 25, Moorside Road, Knutsford, Cheshire.

* * *

ON the 15th December the **Moray Aquarium Society** was formed. The Club is to cater for tropical fishkeepers in the Morayshire and surrounding districts. Meetings will be held fortnightly at the Club's temporary quarters, 11, Caroline Street, Forres. Anyone interested in joining will be made most welcome. Further information can be had by applying to Mr. T. Burke, 1, Harron Way, Kinloss, Forres, Morayshire.

* * *

THE **Ilford and District Aquarists and Pondkeepers Society** held two meetings during November. The first was for group discussions and the second was for the Society's annual all classes table show.

At the general meeting, discussions on tropical and coldwater fish and furnished aquaria provided some useful information, particularly for new members.

The show gave an opportunity for members to exhibit their prize fish. There was a wide selection of exotic specimens from many parts of the world and some varieties bred in near-natural conditions in aquariums by members own homes. Judge was John Brydon, a local expert, and winners in the 17 classes received prizes. Awards: Best livebearer: Mr. Hatton, red swordtail. Best egglayer, Mr. Cook, lionhead (goldfish variety). Best native exhi-

Mr. Sansom, Nassarenus ascendens.

Anyone interested in fishkeeping should contact the secretary, Mr. R. Ruth, 13, Dairsie Road, Dagenham.

* * *

OBITUARY

IT is with deep regret we announce the death of Mr. E. R. Bramden, a founder member of the Bristol Aquarists' Society, which was founded in 1929. Mr. Bramden, who passed away at Christmas, was 67. He was also one of the West Country's best known breeders of egg fish.

THE **Erith and District A.S.** announce that they have more than doubled their membership during 1965, and as a result, have planned a most ambitious programme for this year. A public exhibition of fish is anticipated in the spring, and some other exciting ideas are in hand. The society meets on the first and third Wednesday in each month at the Congregational Church, Bexley Heath, at 8 p.m., and prospective members will be very welcome. Enquiries may be made to the secretary, Mr. A. Carter, 10, Lyne Road, Erith, Kent.

* * *

THE **Marine Study A.S.** will welcome any aquarist interested in the study of both native and tropical marine and brackish water fishes. The first edition of this magazine has been sent to several interested clubs and a great deal of interest has been shown in these topics. Officers for the first year are: Chairman, Mr. J. V. Morrice; vice-chairman, Mr. A. Jessopp; secretary, Mr. G. H. Jennings, 2 Gatcombe Road, London, N.19. The society has already received enthusiastic regional support, and hopes to be able to obtain secretaries for these regions shortly.

* * *

THE third annual dinner and presentation evening of the **Newport A.S.** was held in December. Due to the non-attendance of the guest of honour, Mr. Ralph Harris, president of the society, through illness, presentation of awards was during 1965 was made by Mr. Leslie Hogan, chief staff reporter of the *South Wales Argus*, a local newspaper that has done much to foster interest in aquarium-keeping throughout the area.

Award winners were as follows: South Wales Argus Cup for highest aggregate points in Newport open show 1965, Society Cup for best furnished aquaria (tanks over 2 feet in length), Points Challenge Shield, Breeders' Trophy—Mr. Ralph Harris. Cole Cup for meritorious services to the society—Mr. Ivor Phillips. Furnished aquaria (ladies' section)—Mrs. Molly Burgwin. Furnished aquaria (tanks under 2 feet)—Master Nigel John. Junior Trophy—Master Clive Pemberton. Awards were also won during 1965 by two members of the Tonbridge and District A.S.—Mr. D. Harvey (best fish in show and best eggbearer in show), and Mr. J. R. Wheeler (best livebearer in show).

Crossword Solution

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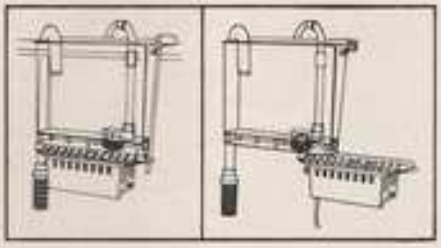

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