WALTER R. SMITH LTD.

For Complete Tropical and Coldwater Aquaria also Tropical Marine
100 Varieties of fish usually in stock on view
in 76 polished stainless steel aquariums

<table>
<thead>
<tr>
<th>Polished Stainless Steel</th>
<th>Frames</th>
<th>Aquariums</th>
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<td>24 x 15 x 12</td>
<td>£ 7 7 0</td>
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<td>30 x 15 x 12</td>
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- McLynn's Fish Food
- E.S.S Products
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Pond Fish 2¢
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Amazon 2¢

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Carolina Tetra (M. yatra) - 12.5 each
Fancy Variations - 7.5 each pair
Large, Tall For Black - 37.5 each
Platy Varieties - 12.5 each

TROPICAL FISH LIST FOR JUNE/JULY

**REGULAR STOCKS ARRIVING WEEKLY**

**LIVEBEARERS**

Guppies
- 18 each
Dwarf Guppies
- 12 each
Lace Guppies
- 12 each

**Swordtails**

Red Burmese
- 30 each
Red Long Fin
- 30 each
Green Long Fin
- 30 each
Blue Long Fin
- 30 each
Yellow Long Fin
- 30 each

**Barbs**

Red Streaked
- 8 each
Skateboarder
- 12 each
Black Neon
- 8 each
Bloodfin
- 8 each
Banded Rainbow Mecklenburg
- 3 each

**Labeo**

Hockey Stick
- 8 each
Black Neon
- 8 each
Blue
- 8 each
Garden Benki
- 12 each
Nemo Breeding Green
- 12 each

**PLATYS**

Black
- 5 each
Gold
- 5 each
Yellow Tail
- 5 each

**FISH & LOACHES**

Corydoras
- 2 each
Bronze Catfish
- 2 each
Giant Kioi
- 2 each
Stickleback Loach
- 2 each

**TETRAE**

Fancy
- 5 each
Black
dweller
- 5 each
Tetra
- 5 each
Platensis
- 3 each
Black and White
- 3 each

**PANCHAX GROUP**

Panchax
- 2 each
Devi
- 3 each
Lindens
- 4 each
Chinese
driver
- 5 each
Pepperhiti
- 5 each

**ACHIEMENI**

Cubanis
- 6.5 each
Colubris
- 6.5 each
Bullseye
- 6.5 each

**RASBORA**

Harlekins
- 1 each
Pompadour
- 1 each
Plecos
- 1 each
Pindorensis
- 1 each
Pindorensis var.
- 1 each
Pindorensis var.
- 1 each

**CICHLIDS**

Angels
- 1 each
Sailfin
- 1 each
Lace
- 1 each

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# Queensborough Fisheries

See overleaf for further information.

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### Tropics

<table>
<thead>
<tr>
<th>No.</th>
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<td>Dwarf Lily</td>
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<td>1 Cream Water Lily</td>
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<td>(Princess Alba)</td>
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<td>2 Iris</td>
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<td>1 Cream</td>
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<td>18</td>
<td>Water Lettuce</td>
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<td>Very beautiful plants</td>
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<td>White</td>
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<tr>
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<td>Nuphar Alba</td>
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Algae eating Pond Snails: 6d each

14"-16" Hygro Carp: £15 per pair. Limited Number Available.

Large Stocks of Coldwater Fish—Thousands of Tropical Fish in Stock.

Stocks of all Ponds. Fountains, Statues, etc.

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Stand 18 x 10 x 36 37/6
24 x 12 x 36 47/0
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115w.

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THE AQUARIST
Breeding Emperor Tetras

I obtained some of these handsome fish about 2 years ago. Although it is quite a pretty fish it does not seem to be plentiful, which is a great pity as it is of a very undemanding nature and well suited to the community tank. It grows to a little over 2 inches in length.

The colouring is a brownish to olive on the upper sides with a metallic blue-green line running the length of the flanks and a thick velvety black longitudinal band which continues on to the middle fin rays of the caudal fin. The belly is a pure white; fins are colourless with a metallic blue-green sheen reflected in the light.

The iris of the eye is also a shining blue-green. Colouring of this fish is further enhanced by a dark tank bottom and plenty of plant life.

Setting is quite simple in mature fish because the female is fuller bodied and deeper belled than the male. The male has the middle rays of the caudal fin produced into a very pronounced spine point, which barely shows in the female.

The temperature range is from 72°F (22°C) to 80°F (27°C). When spawning I use the following procedure. A 36 in. tank is filled to about 6 inches with well matured tap water, with a bottom covering of boiled peat. Shallow water is essential as the fish are quite partial to the eggs. For plants I use plenty of Myriophyllum or Najas. The temperature is 80°F (27°C) and the tank receives a fair amount of sunshine.

The breeding pair are placed in late at night and left to settle down. Spawning follows within the next 2 days, with the male driving the female round the tank with a side by side head-down position. The eggs are scattered anywhere about the tank. After spawning the parents are taken out of the tank and malachite green is added to a concentration of one grain to 4 gallons of water to eliminate fungus. The fry hatch in about 24 to 30 hours and are free-swimming after about 2 days. The fry soon begin to grow and after about a month are unmistakable miniatures of their parents and make a lively show swimming together.

I then add Infusoria from apple snails. There is also a large amount of Cyclops nauplii in the breeding tank.

Unlike some tetras, which seem to need soft acid water for breeding, this tetra does not; the pH of my tank is 7.2 and the hardness is 12 degrees D.H.

I. Goatcher
Our School Aquarium

One of the biggest problems a science teacher has to face is that of keeping livestock in schools. Mammals, in particular, require a constant care that is not always possible, especially during the long school holidays and at week-ends. Nevertheless, I consider the study of some form of animal life essential, and it was with this in mind that I formed the Vivarium Society at the Central School for Boys, in Macclesfield.

Fishes, reptiles and amphibians seemed the obvious choice, not because they are any easier to keep than mammals, but mainly because they can be left for comparatively long periods without coming to serious harm. At the school, at the moment, we have nine fish tanks, and two terraria for reptiles and amphibians.

Besides being a fascinating hobby, I have found the keeping, breeding and study of fishes one of the most useful and instructive of pursuits I have ever carried out. An aquarium embraces so many scientific principles that I wonder how I ever did without it. Yet it is not as difficult as one might think; there is always something new going on and my boys are absolutely delighted with it. Above all, they learn, and learn in a pleasant and satisfying manner.

Since the inception of our Society, I have learnt so much from a practical aspect that I feel it worthwhile to pass on my experiences. The biggest obstacle is finance, and as it can cost about six pounds to set up a 24 in. by 12 in. by 12 in. tank, there are not many local education authorities who would be prepared to supply many tanks at that price! I began by canvassing the boys. I asked them if they had any old tanks, broken tanks etc., or knew of anyone who had. Over a period of a few months I had quite a good response. I received an amazing medley of old tanks, heaters, thermostats and filters. Most of the heaters and thermostats were useless. I discarded the filters, and found only one of the tanks serviceable. This was a blow, yet later it proved a good thing.

To get things going, I rigged up the good tank, stocked it with a few fishes and plants, then formed my Vivarium Society. I placed the facts fairly and squarely before the first dozen members; money was our immediate need. We formed a committee with treasurer and secretary, and all members agreed to pay sixpence per week, and we were away.

To keep an interest alive we stripped all the remaining tanks to the bare frames and cleaned, painted and repainted them in the approved manner. This was good exercise for the boys and I thoroughly recommend that all tanks should be at least glassed at the school.

I think that a standard size of tank should be adopted, or at least a standard depth and width. A 12 in. by 12 in. end section is, in my opinion, ideal and in our main aquarium this is the standard we use. The three tanks at the top are 27 in., 36 in. and 30 in. respectively, and the bottom four are all 24 in. long.

Tropical fishes are the best kind to keep in the early stages because (a) they are generally more colourful and active, (b) they are not as difficult to look after as cold-water types, (c) they are less susceptible to disease and (d)
they need some form of heating, which is helpful from a scientific point of view.

Each tank should be set up by the pupils in the first instance under the guidance and supervision of the teacher. Later they will be able to do it themselves quite easily.

If a number of tanks are contemplated, as they should be, then a stand to contain them all should be made. Our stand was made by a local engineer and cost five pounds including the wooden frontage. The overall measurements are 8 ft. 6 in. by 6 ft. 3 in. by 1 ft. 11 in. The top, sides and doors are of hardboard painted and glazed to cheap wooden frames, then finished in Polytone. They could, of course, be painted.

Personally, I do not think aeration by means of a stone is desirable or essential. Its oxygenating properties are doubtful, and it settles up sediment and keeps it in a continued state of suspension. On the other hand, I am a firm believer in filtration, and outside filtration at that. I would have liked to use the gravel bed of each tank as the filter, but this would have defeated the object of visible scientific principles, so I use outside filters. These filters are modified by the insertion of an open topped box of stainless steel gauge to contain the medium. This simplifies cleaning. The box is just lifted out and emptied of the old material, the new medium is put in and the box replaced in the filter.

We do not use glass wool. We make up our filters in the manner of the filter beds used in water-works. In the bottom is placed a layer of charcoal, about an inch, then a layer of coarse sand, then on top, a layer of medium gravel. I find this just as effective as glass wool and the water in our tanks is crystal clear. If the tank contains fish, then good running water then a layer of peat is placed between the charcoal and the sand. All materials except the peat are reclaimed by washing and drying, and for the charcoal, baking at 300°F (149°C) for an hour. This vitrifies the charcoal and filter costs are reduced drastically.

The tank bottoms are first covered with a half-inch layer of the sand sold for John Innes compost, then a layer of gravel as required for aquarium use. We never wash any of this material, nor do we, when placing in the first lot of water, take any particular care how it goes in. The effect of leaching the fine sand in between the larger pieces of gravel seems to be beneficial to plant growth. We place in any rocks and stones needed, then let the tanks stand for 4 or 5 days. Heater and thermostat are then placed in and then the filter. We see them ready for planting. The majority of plants are just placed on the tank bottom and held down with small stones. Such plants as Cabomba, Myriophyllum, Anubias, even Sagittaria, Ludwigia, Valisneria and pygmy chain sword, are treated in this way. Larger plants, with strong root systems, are planted in the normal manner.

I find aquatic plants to be the best material for teaching vegetative reproduction. Indian fern is a beauty for this. Some books state that the new plants form on the stems and stalks of Indian fern. We have found this definitely not so. There is no doubt that the new plants form on the veins of decaying leaves. All we do is to place a dying leaf that has new plants on it on the surface of the gravel, weight it down with a small stone, and in a couple of weeks we have about a dozen strong, new plants.

Water condition has a high priority with us. Hardness tests are made regularly; this gives a purpose to what otherwise might seem endless experiments in class. The younger boys use the Winkler test and the older ones the Schwarzenbach method, and the results are recorded both as calcium oxide and calcium carbonate for comparison purposes. Occasionally, as an exercise, we adjust hardness, either by the addition of lime water or by changing some of the tank water for water from the rain-water butt. pH is treated in the same way, as an exercise, found by the bromothymol blue method; as with hardness, we occasionally adjust pH with sodium bicarbonate or sodium dihydrogen phosphate. Our tap water is about pH 7.4, which makes it a very useful water to have. Generally, we find that once in the tanks it tends to go acid after a time, but only just so. As the equipment for these tests is a part of the laboratory equipment there is no outlay here.

With regard to snails we have one rule...'See a snail—kill it.' We regard them as pests. They are not worth the little work they do as scavengers as they exact too great a price in ruined plants. We find catfish ( Corydoras ) do so good a job on the bottom, whilst such algae-eating fish as Innesichthys find a place in every tank to keep down algae.

For a time we were troubled by plants not thriving until
Water testing is done regularly. Here a pupil is seen estimating water reaction by a bromothymol blue test.

we realised that no light on Saturdays and Sundays, and often over holidays, was having a detrimental effect on them. The lighting is now automatically controlled by a timer switch and is on for 11 hours every day. Our lighting is simple but effective; 100 watts of tungsten lighting per foot of tank. The tanks are bright but not excessively so, and both plants and fishes thrive. Any excess of algal growth is kept to a minimum by well planted tanks, by the Gyriochilus and by systematic elimination.

Naturally, electricity and heat play a large part in our aquarium set up. Thermostats are of the bimetal strip in glass tube type, and we use the large ones which can be adjusted from above the water surface. Thus the boys have a visible practical example of expansion, particularly unequal expansion. The heaters are useful for illustrating the heating effect of a current, although as yet we have done no quantitative experiments on this. The filters are operated by air lifts, the air being supplied by a synchronous motor-operated piston pump.

Fishes by Families

Now to the fishes themselves. Community tanks, containing many types of fishes, are all right for decoration, but for serious study are useless. As scientific classification is important we separate our fishes according to their families. At the moment we keep only five groups: Cyprinodontidae, sub-family Poeciliidae; Anabantidae; Cichlidae, genera Barbus, Brachydanio, Danio and Rasbora; Characidae; Callichthyidae. There are also the one common genus of Gyrinocheilus and a few species of the family Cobitidae. The last-named three families are distributed among all the tanks as scavengers. Of the livebearers, Lebistes and Mollies are kept together in the same aquarium. The males are segregated. The same applies to all the Xiphophorus species. Of the anabantids we keep only gourams (five species). The sexes are not separated at the moment as we have not the room, but later we are going to put in a further six tanks, then sexes of all fishes will be segregated. This also applies to the Characins, rasboras, danios and barbs.

Boys are encouraged to learn scientific names of fishes for the obvious reason, but I must admit they prefer the common names. This also applies to plants. All tanks are labelled with the contents and a full list of plants and fishes is posted on the classroom wall.

At the moment we breed only livebearers selectively, although we have had indiscriminate breedings of gouramis and barbs. When we have the use of our new tanks we shall tackle selective breeding of all types. Strict genetic principles are followed in breeding, and we have succeeded in fixing characteristics in both gouramis and barbs. We have succeeded in getting these characteristics in both gouramis and barbs. The important thing from the point of view is the knowledge gained. We get quite a large number of young fishes, the sale of which augments our meagre income.

Feeding and Maintenance

Feeding is no problem. We use two dried foods which we have found the best. We use the two to provide a change of diet, and we feed small quantities three or four times a day, sprinkling the food all over the water surface. For live food we use white worm (our only culture), cheese on a piece of string, and gold boiled liver rubbed through a flour sieve, and made into a paste. We feed live food about once a week and, despite what the purists say, our fishes really thrive.

Owing to the large number of plants we get little algae and we rarely have to clean tank bottoms. Gyrinocheilus (wonderful fish these) keep the glass clean. Any other maintenance necessary is carried out on club nights. We have developed a routine so that I rarely have to give orders. Any new members are instructed by the old hands. I have no holiday problems apart from too many boys wanting the job of looking after the livestock. A rota is made out and I can honestly say that I have never been let down.

We have few health troubles, due no doubt to our scrupulous cleanliness, and the fact that we keep a hospital tank wherein all new fishes are quarantined for 10 to 14 days. This proved itself when one occasion we did not quarantine a batch of half a dozen fish. White spot ran riot. We beat it with methylene blue used in the hospital tank so that the water was almost opaque. One tank of fish was treated at a time in the hospital tank for 14 days. Tanks that were awaiting treatment were treated, with two drops per gallon of 5 per cent methylene blue per day. We lost 17 fish, all Xiphophorus, out of a total of about 200. Moral: Always quarantine new fishes.

In conclusion, let me say that from a scientific viewpoint, there is no better hobby than fish keeping. What else could give the teacher a text in Chemistry, Botany, Zoology, Genetics, Electricity, Heat and Light, and Mechanics and Hydraulics in so small a compass?
An Unusual Aquarium Tank

by NEIL WAINWRIGHT

FROM time to time The Aquarist has published articles on the making of various types of aquariums. Most of these tanks have been of angle iron or solid wood construction.

There is a lot to be said for the use of plywood for tanks, but it needs to be of "exterior grade" quality. Such plywood is bonded with a synthetic resin glue, and is readily obtainable at all woodworkers' supply stores. Rain-bonded plywood stands up well to the conditions experienced in an aquarium tank, and test samples have been kept submerged in water for 15 years without showing signs of peeling; interior quality plywood would soon disintegrate under such treatment. There is nothing in the wood or glue that can wash out and cause harm to fishes or plants.

For equal thicknesses plywood is stronger than solid lumber, and it requires fewer tools and less skill to work. The only drawback is that the laminated edges do not look attractive, but these are easily concealed with a thin solid wood (or plastic) beading.

Perhaps the chief advantages of plywood are the way in which it can be handled to produce tanks in quantity or ones of unusual size or shape. Breeders, for example, will find that a number of tanks can be quickly assembled from plywood. This can be an important factor both for the making of breeding tanks and for additional tanks in which the fry can be brought along to maturity.

Here is an example of the use of plywood for an unusual form of tank. The tank had to stand in a corner, so in plan it was of triangular shape. This caused no problems apart from the fitting of the glass, and when planted out it formed an unusual and attractive feature. By the use of woodwork and plants of suitable size the tank was given the appearance of unusual depth from front to back, so that there was a visual impression that the tank actually passed right through the wall and into the next room.

Plywood of 4 in. thickness was used for the sides, which were both 1 ft. 2 in. high; one was 1 ft. 3 in. wide and the other 1 ft. 2½ in. wide.

The longer side was glued and screwed at right-angles to the shorter. A synthetic resin glue was used, this being waterproof. There are several suitable proprietary brands on the market, most of them demanding that the glue be applied to the two surfaces and allowed almost to dry before the two pieces of wood are brought into contact. Holes for screws had therefore to be made before gluing. A hand-drill with a small bit was used for this job, and on the longer panel the screw-holes were countersunk so that the heads of the screws would come well below the surface of the wood. Brass screws, 1½ in. long of small gauge, were used at approximately 2 in. apart; galvanised or other non-corrosive screws would have served equally as well.

The front edges of the sides had to be taken off at an angle so that they would match up with the front edge of the base; the surplus wood was taken off with a Starline tool. The base itself was simply a triangle of plywood,
glued and screwed to the bottom edges of the sides, level with their outside faces. Two strips of plywood, 1 in. wide, were then prepared to fit between the sides at the front at top and bottom of the tank. This was done by marking off the angles at the ends while the strip was laid in place, and sawing them rather "false." One each strip was glued and screwed (from beneath) on the baseboard, but the other was not fitted at this stage.

The glass was fitted into prepared channeling of the type shown in end-section on the drawings, and came from the same source as the plywood. It was possible to buy this in wood or plastic but the latter was preferred. Synthetic resin glue was used for fixing it in place.

It was easy enough to fix the channeling at top and bottom as it was only necessary to cut the ends at the same angle as that on the wooden strips. On the sides the grooves would not have been at the proper angle if the channel had been simply laid in place, so it was necessary to take a strip of wood and angle it off on the back edge so that the groove would be brought into the right position as shown on the drawings. Two strips were prepared, to fit between the top edge of the bottom cross rail and the bottom edge of the top small strip, and they were glued in place.

Before proceeding further, a thin bead of aquarium cement was put along the inside meeting edges of all plywood members, and the holes above the screw-heads were similarly treated.

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**BREEDER'S RECORD**

**Success with the Bumble Bees**

by J. LEE

I AM a tropical and coldwater fish breeder. In my fish house (8 ft. by 8 ft.) I've been breeding fishes now for 15 to 16 years, over which time I have successfully bred a long list of species, egg-laying tooth-carp, killifishes and characins. Fishes in my collection I've bred are neon and cardinal tetras, blue guppies, yellow guppies, bleeding-heart tetras, many of the barb family and a lot more coldwater fishes such as goldfish and shubunkins, sticksharks, blue bittling and a few more.

But recently I've achieved the greatest success of all with a fish that will agree is a very difficult subject for any aquarist according to the books its breeding in aquaria is a very rare feat so you can tell how happy I was to produce young fishes of the humble bees. I would like to pass the information on to other aquarists who may hope to breed these difficult fishes.

I followed the books' recommendations with only one difference, and that was the size of the tank. Being stuck for room and big tanks, instead of using a 10 or 12 gallons tank I used a small (18 in. by 10 in. by 10 in.) persepct tank with bottom and sides painted black but one end clear. I disinfect the tank with potassium permanganate and strong Detrol solution and swilled it out well. I included a 3 in. flower pot, which I filled with boiling water and placed on its side just off the centre of the tank on a 1 in. layer of deep sand collected from the canal bankside some weeks ago. I had boiled this and mixed it very well until perfectly clean. I used the water out of the tank where the fish were kept (aged tap water, which here where I live is just about neutral), topped up the tank with a third with fresh from the tap to make it 4 in. depth, covering the flower pot by 1 in. Then there was about 2 gallons of water in the tank, to which I added three level teaspoonfuls of sea salts. I let the water clear for about three days and then planned some fresh young Indian ferns. These were about 4 in. tall and I headed them down thickly all around the flower pot.

I put the pair of bumble bees in at night just before dusk. The female was bulging with eggs and the male looked fit and slim. Next day I saw that the female had made a hole under the pot and had hidden. The male was active at the front of the tank. On the third day I had been out all day and was amused when I got home to see eggs, not on the roof of the flower pot as it said in the book and as I was expecting to see, but all over the ferns and on the bottom. Some were in little clusters together, and I noticed a very fine thread attached to some of them. Under a strong lens they reminded me of a hen's eggs in shape with one end tapered slightly. At this stage I added 7 drops of methylene blue to the water. The temperature was 76° F (24°C) although they had spawned at 78°F (26°C). I slipped a piece of brown paper over the tank to darken it and took the female out. I left the male in and waited anxiously. It took 6 days before I saw a few fry moving about, and then I took the male out. Now I'm hoping to rear some young bumble bees.

THE AQUARIST
Aquarist’s NOTEBOOK by P. M. FULLER

It seems that an item in ‘Aquarist’s Notebook’ for March caused at least one reader a little consternation. He was puzzled as to how migrating salmon suddenly took on the attributes of climbing perch, and reached the higher reaches of the river by using a ladder to surmount a dam.

Last there should be any other readers who could not visualise how a ‘fish ladder’ operates, I am supplying photographs this month, which I hope, give some indication as to the ingenuity of the construction at Pitlochry.

Photograph 1 shows the higher steps of the ladder. Each stage is connected underwater by large steel pipes, through which the salmon pass. The viewing panel is situated at the highest point of the ladder, before it drops down on the far side of the dam. Photograph 2 shows, on the left, the lower steps, just after the point at which the ladder, doubling back on itself, enters the river. The fish are attracted to it by the strong currents in this area. The salmon hatcheries are situated beneath the metal panels, to the right of the picture, on a level with the dam wall.

* * *

A recent article on thermostats in The Aquarist raises an interesting point about temperature fluctuation, which is worth noting. The writer explained how the outside thermostat was unreliable because it was affected by external temperature. He rightly pointed out that when the room became cool in the evening, the temperature of the tank rose appreciably, and when the room was warmer, the tank became colder. He then went on to outline an ingenious method of stabilising the temperature so that it would remain constant despite outside conditions.

I have been taking thermometer readings from my tanks regularly and recording them for the past 5 years, and they do in fact verify the author’s observations. However, the daily deviation from the temperature at which the thermostat is set has rarely, if ever, exceeded 3°F under normal conditions. Now, it has been acknowledged for a long time that in Nature the temperature is far from constant. In running streams and rivers quite wide variations occur in a comparatively short space. Various authorities have pointed out that because of this a temperature cycle should be introduced, if not on a daily basis but on a weekly or monthly scale, and ideally on both. For the average community tank, and all but the most delicate species, the deviations from the set temperature caused by using an outside thermostat, which are never so violent or sudden as to be detrimental, provide a convenient way of creating such a cycle, without the necessity of intervention on the part of the aquarist. For this reason, I do not think that it is necessary, or even desirable, to take steps to eliminate variations in the temperature when using such an instrument.

I hear that about thirty prisoners in Parkhurst gaol, on the Isle of Wight, have taken to keeping tanks of fishes in their cells. This pursuit apparently has the full sanction of the prison authorities (in fact it is difficult to see how it could possibly function without their co-operation!). One warden commented ‘They help to brighten up the cell’s day, and I think they probably do more than that. An aquarium needs care and attention; its well-being is directly dependent on its owner. It is in fact a responsibility, and surely, it is beneficial to give prisoners responsibilities, however small such responsibilities may be.

I think this is another field in which there is scope for work by aquarium societies. I mentioned last month the need for closer co-operation between aquarium societies and schools; this recent information seems to indicate that such co-operation could be extended to prisons as well. Why not lectures by leading local aquarists on the various aspects of aquarium keeping that are practical within the imposed prison restrictions? Perhaps even a table show? Who knows, the Home Secretary may soon have to deal...
ABOUT THE POND THIS

Hatching, Rearing

by

My article last month described how to take the goldfish eggs from the pond for hatching in safety. If the eggs have been kept in a warm place the eggs will hatch in a few days. Although many books on the subject give a definite time for this to happen, it is quite impossible to be able to say with certainty how long the incubation period will be. It all depends on the temperature of the water. At a temperature of 70°F (21°C), eggs will hatch in 4 days; nearer 80°F (27°C), they can hatch in 3 to 3½ days. At a temperature of 60°F (16°C) they will take about 6 days. I consider that 70°F (21°C) is ideal.

During the incubation period it is essential to watch the condition of the water to make sure that it has not become fouled. This is best tested by smell. Change a large quantity if it appears bad but see that the water is at about the same temperature as the old. Once the fry hatch do not disturb them for a couple of days. They will hang on to the sides of the tank or water plants whilst they are absorbing the yolk sac with which they are born. They will not feed until they are free swimming and so the time to start feeding will be indicated then. The time taken for them to become free swimming depends again on the warmth of the water. At the ideal hatching temperature, they will be feeding in 2 days.

First Foods

The first food will have to be very small and the best is Infusoria. This can be cultured by adding boiling water to crushed lettuce leaves or hay. After a few days the water will look cloudy due to the presence of thousands of tiny creatures. If a small drop of the water is placed on a microscope slide at 84 magnification, Infusoria will be seen moving around. This culture can then be allowed to drip into the fry tank at the rate of a drop every few seconds or so. Be sure that the water actually contains live creatures or you will only be adding foul water instead of food. If you cannot make a good culture then there is no need to worry. You can buy tubes of fry food quite suitable for your purpose and I have used such foods successfully for many years. Some of these tube foods could be added to the water of the hatching tank whilst the fry are developing in the eggs so that there is likely to be a supply of Infusoria ready for them when they hatch.

There are many types of fine foods which can be used, but take care that too much of dried types are not used as an excess can easily foul the water. Mashed earthworm makes a very good food with which to follow on. It should be the task of the aquarist to run on to try to feed with foods of increasing size. Live types are undoubtedly the best but do not despair if they cannot be obtained. It is quite possible to rear fry on dried foods alone. Whole worms can be mashed whilst the fry are small and then given in larger sizes until they can be fed whole.

Another important thing to watch is that the fry do not become overcrowded in the tank. It is far better to spread them out into several tanks than to try to rear too many

The author suggests that the fry be fed on a variety of food types, starting with Infusoria, mashed earthworms, and eventually progressing to larger sizes as the fry grow. The author cautions against overcrowding the fry tanks, as this can lead to fouling of the water. The article also provides guidance on the ideal temperature for hatching the eggs, which is around 70°F (21°C), and stresses the importance of monitoring the water quality during the incubation period.
MONTH
and Feeding

A. BOARDER

Swimming space appears to be almost as important as food in the early stages of development. If the eggs were taken from the pond on water plants it is almost certain that there will be some pests on the plants. Small larvae of insects can hatch out and also the tadpoles of newts. These can be a nuisance in the fry tank when they grow a little. At first these tadpoles are slow moving, but they soon become very active and can eat the fry. Where such creatures are suspected it is advisable to catch all the fry and put them into clear water. This is best done by using a small white enamelled saucepan. The contents can then be inspected to make sure that no pests are put into the new tank.

From now on, with proper feeding and care that the water does not become foul, the fry will grow rapidly and new need spreading out once more. Then is the time to start the fry to remove any which are misshaped, and it will also be necessary to sort out for size. It is almost certain that there will be a few which will grow on faster than others. If these larger ones are not removed it is possible for them to be able to eat their brothers and sisters when about a month old.

Variety of Food

After this time the food can become more varied and plenty of variety is good for the growth of the fry. Always try to give some form of live food every day and see that as long as the fry are eating well they are not allowed to go without food for long periods. Do not put the young fry into the pond until they are at least an inch in body length. Fortunately, it is not often that small fish will be eaten by goldfish once they are out of the fry stage.

Meanwhile the fish in the pond must not be neglected. After the spawning they require adequate feeding and should be given as much food as they will eat. Always test their appetites by putting a little food in the usual place. If this is taken some more can be given. Make sure that too much dried food is not given at any one time. One point to remember with goldfish is that they do not have to be fed continuously once they get about 3 months old. It is surprising how long goldfish will go without food, especially in a pond. I have known them go for months without being artificially fed. There is always likely to be a quantity of natural food for the fishes in any well-balanced pond. Remember that there is little in the shape of human food which goldfish will not eat and so it is easy to provide a suitable diet.

As the weather warms up the water may become rather foul through the formation of gases from decaying unedible food. Some fresh water can be run into the pond, especially during thundery weather. Such fishes as golden orfe are soon in trouble if the water warms up too much.

Frog and Toad Tadpoles

I have mentioned before the value of frog tadpoles as food for fishes, but this live food will not be available now as the frogs will have developed. I have written in these columns that although goldfish will eat frog tadpoles they will not eat those of toads. An experienced pondkeeper wrote to me to tell me that his fish did eat toad tadpoles. At my request he made some experiments and found that goldfish would eat toad tadpoles when they were very small but after a time as they grew the goldfish ignored them. This was in keeping with what my brother had told me. My brother found that, after having fed his goldfish with the tadpoles of frogs, when he introduced some toad tadpoles the fish took them in their mouths but immediately spat them out, and they were left alone after that. These would not have been very small tadpoles, for he would wait until they were at least half grown before using them as food. I always wait until they are big enough to make a decent meal. As is well known, the skin of a toad gives a secretion of a kind which is very distasteful to animals. If a dog picks up a toad it will foam at the mouth. It is probable that the tadpoles develop this substance at some stage, and it will be a matter for further experiment to find out at what stage this chemical is present on or in the skin of the tadpole.

Once the water plants are growing well it may be possible this month to prune some of those which are too vigorous. At this time of the year it is possible that some pests may have entered the water. These may be water beetles and their larvae, also those of dragonflies. These can harm young fishes. It is a good plan to inspect the pond at night with the aid of a torch, as many pests appear to be much easier to catch then; they often come to the surface of the water late at night.
A Colourful Native—The Perch

by B. FRY

The common perch (Perca fluviatilis) is very widely
distributed across Europe (excluding Scandinavia,
Spain, southern Italy and southern Greece), northern
Asia and the eastern half of North America. It occurs in
rivers, canals, lakes and large ponds throughout the British
Isles with the exception of northern Scotland.

The general colour is light tan to golden yellow, the back
olive brown, the belly silvery white. Six to ten black,
vertical bars adorn the rather deep and somewhat com-
pressed sides. There are two dorsal fins coloured blue-
grey to grey-green, and a yellowish green caudal fin only
slightly lobed.

The first dorsal fin has 14 or so sharp-pointed spines, and
a darkish blotch posteriorly; the second dorsal fin is soft-
rayed and edged with pink to red. The anteriorly spined
anal and ventral fins are orange to scarlet; the pectoral fins
are yellow. Short spines or spindles project from the
gill-covers.

As a rule, the perch attains a length of about 12 in., but
much larger specimens are caught from time to time, both
in this country and abroad. In the wild the perch frequ-
ts many muddy places, or anywhere else for that matter
where it can hover around in wait for its prey—living
creatures such as smaller fishes, frogs, worms, insects and
their larvae. It is almost as savage and voracious as the
pike (as in the pike its strong jaws are well supplied with
teeth) but unlike that fish it does not live a solitary existence,
but shoals, especially in its young state, with its own kind.

Spawning takes place in late spring, when the fish is
about 3 years old. After some delay by the brighten-
geared male, the female deposits eggs imbedded in fetc-
long ribbons of what looks like clear jelly. These ribbons
are draped over and among the water plants, the sub-
merged roots of waterside trees, waterlogged pieces of
wood, craggy boulders and so forth. It is said that a well-
grown female can produce about 300,000 eggs. She needs
no; for whatever other fishes or water fowl come across the
trailing masses of ova they have a Lord Mayor's banquet.

The eggs incubate in 1 to 2 weeks, and the first thing the
newly hatched fry set out to do is to fill their swim-bladders
with swallowed air. Fry which are too weak to break the
surface film, or are prevented from reaching the surface
within about 2 days after hatching, soon die.

Baby perch are easy to capture in weedy shallows about
July. They make highly interesting and easily tamed cold-
water aquarium pets. Those taken from still waters—
farm-ponds and gravel pits, settle down best. A capture
perch's basic requirements are cool, well-oxygenated water
and resting places behind massed plants, Daphnia,
chopped earthworms, goat larvae, tiny grubs, pieces of red
cooked or uncooked meat and the like, are a necessary part
of its diet. It has a life span of upwards of 5 years (in the
aquarium, that is), and the ability to survive out of water,
wrapped in wet moss or grass, almost as long as the tench.

Home-Made Breeding Trap for Livebearers

by F. C. BOUCHER

MODERN household plastics can be put to very good
use in the fish house. All that is required to make
a breeding trap is a plastic container with lid, about
8 in. long, 4 in. wide and 4 in. deep; a nylon scouring pad,
two rubber suckers and an elastic band. The bottom is
cut out of the container and two holes are drilled in the
side to take the rubber suckers. The nylon pot scourer is
then unravelled and a piece cut out that will cover the
bottom of the container and extend about an inch up the
sides. This is secured in position with the elastic band.
The trap is then ready for use, but it is sometimes advisable
to use the lid of the container with a few ventilating holes
drilled in it, to prevent the female from jumping over the
lip of the trap into the main tank.

This idea can be modified to catch the eggs of fish such as
mullet as they fall to the bottom of the tank. In this
case the parents will require the whole area of the tank for
the spawning, but if a large but shallow plastic container
covered by the nylon scourer is used at the bottom of the
tank, the fish can effectively be prevented from eating their
own eggs.
OUR EXPERTS’ ANSWERS TO TROPICAL FISH-KEEPING QUERIES

I have just bought a pair of live-bearing half-backs (Devarasoma aequinota). Do the conditions and food suit this species here?

The live-bearing half-backs flouresce best in either shallow water to which a small quantity of evaporated sea salt has been added, or, in the proportion of one level tablespoon to every gallon (but bear in mind that once the initial supply of salt has been added to the aquarium it is asking for trouble to add any more). Plants that float near the surface are essential for the safety of the fry. Tiny worms fed from a perforated looder, quaintly named Daphnia, and the like, should be offered as food. A temperature range of from 65°F (18°C) to 75°F (24°C) is recommended. If the fish is kept at higher temperatures for protracted periods, there is a tendency for the females to produce deformed or stillborn young.

Is there an easy way of removing chlorine from mains water so as to make it safe for almost immediate use in a fish tank?

Chlorinated water is allowed to gush violently into a bucket its toxic properties will be lost in the atmosphere as the gas is discharged from the water.

I intend to set up my first tropical tank in a day or two. Do you think anything is to be gained by placing a layer of garden soil or peat on the bottom before adding the seed?

Soft water over a thin layer of peat is ideally suited to the needs of most plants and fishes. But garden soil should be avoided like the plague. The impurities in it alone lead to troubles too numerous to mention in any detail here.

Please tell me the scientific name and how the sexes are distinguished of a fish popularly referred to as the moonlight gourami.

The formal name of the moonlight gourami is Trichopodus nigricans. In mature male the fish the male of the species has bright orange-coloured ventral fins. Further, a female in breeding condition shows fuller sides.

I have noticed some slender bodied creatures with tendrils adhering to the sides of my aquarium. What are these creatures called, and will they prove harmful to the fish?

The creatures you have noticed in your tank are called Hydra, which will catch and eat tiny fry, Daphnia and the like. But they are harmless to grown fish. Some fishes such as the blue gourami will eat Hydra. To get rid of the pests by chemical means it is necessary to remove all the fish from the aquarium, raise the temperature to about 90°F (32°C) and then, for a tank measuring about 24 in. by 12 in. by 12 in., dissolve about 1 ounce of ammonium compounds in water, stir it into the aquarium, and leave for about 3 days. At the end of that time, all the Hydra should be dead. Before re-introducing any fish, all the fish should be shipped away and the tank re-filled with fresh water.

A friend of mine says that the water in my month-old tropical aquarium will soon turn sour and smelly unless I install artificial aeration and filtration. Is this correct?

No, this is not correct. What turns water sour and smelly is lack of aeration and filtration, but overfeeding fish, leaving uneaten food to decay on the plants and not having sufficient light to keep the plants growing.

Is it a fact that the native pond plant called Peonogonum can be grown in a tropical aquarium?

P. punctatum, like the fine-leaved willow moss (Fontinalis antipyretica forms granulata), can sometimes be aclimatised to temperatures up to about 75°F (24°C). It is, however, far from an easy plant to establish in any aquarium, for among its requirements are a muddy subsoil, and daily exposure to a really bright top light.

What causes pop-eye (ophthalmia) in fish?

Suboxic conditions promoting the growth of certain bacteria which lodge in the eye, too sudden change of temperature or pH value of the water, deficiency in diet, knocks—even excessive artificial aeration. All these and more have been mentioned at various times by various authorities as playing a part in triggering off this disorder, which up to the present writing, usually defies all surgical and medical attention.

What conditions and food are needed for the fish named Devarasoma aequinota?

Firstly, this interesting species from Guiana and the Amazon basin needs as much swimming space as you can give it in soft, slightly acid water. Next, a temperature range of about 75°F (24°C) is called for. It is carnivorous by nature, and though a small specimen can be accommodated in a community tank stocked with similar-sized fishes, where it will eat all the regular live foods and meaty substrates for live food, as it increases in size it will make a meal of almost any living creature small enough to be swallowed.

How can I distinguish the sexes of Pelcatesobium maculatum?

In mature fish (that is, fish more than 2½ in. long) the males has darker markings, and his unpaired fins are larger and more pointed than those of the female.

On two occasions my angel fish have spawned, then, without any warning, set to and eaten the eggs. I have been told that covering the ends and sides of the tank with tissue paper will put an end to this behaviour. Is this true?

Sometimes a covering of thin paper, with a tiny peep-hole cut in it for observation purposes, will result in angel fish leaving their eggs unmolested; there is nothing more conducive to happy childish family life than privacy and a somewhat subsidiad light.

Will my fishes suffer any harm if I introduce oak wood-bark or slices of coconut shells into their tank for decoration?

Small pieces of oak bark, after preliminary scrubbing and soaking in several changes of water, are quite suitable for decorating an aquarium. So, too, are well-soaked coconut shells rubbed free of all pith and fibre. All the same, it is necessary to point out that such additions to an aquarium will gradually result in a marked change in the pH value of the water—to an acid rather than an alkaline condition.

I am installing a 4 ft. tank in a dark alcove in my living room, and I would like to know how much electric light (in watts) I will need to maintain the plants and fish in a satisfactory condition. Also, how many hours a day should the light be kept switched on?

Allow roughly 200 watts for your tank. Ordinary clear house lamps, rather than a fluorescent tube, should be used. These should be fitted, several inches apart, in a specially designed reflector hood placed not more than 6 in. above

June, 1965

...
the surface of the water. The lamps should be kept switched on for at least 8 hours every day.

Please give me some information on the essential requirements and breeding procedure of the Cichlasoma rainbow fish.

The essential requirements of this species, formally called *Cichlasoma laevis*, are a brightly lighted aquarium, alkaline water and a temperature of about 79°F (26°C). Spawning takes place among plants with finely divided foliage, and the eggs, which are deposited over a period of several days, hatch in about 14 days. Well-fed parent fish seldom trouble to molest their eggs.

I have never been able to keep the clown loach alive in my community tank for more than a few months. Is this species delicate and/or short-lived?

Given the right conditions, the clown loach (*Barbo zonata*) is neither delicate nor short-lived. What it needs to flourish are plenty of plants to retire into, companions that will neither cheat it nor frighten it by dashing boisterously about, a rather subdued light and a temperature in the neighbourhood of 79°F (26°C). Ordinarily, the clown loach has a life-expectancy of about 4 years, but many specimens kept under community conditions do not long before their time through lack of food. To guard against the bottom-haunting clown loach being deprived of food, see that some shredded red meat or live food is introduced into the tank last thing at night.

**COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER**

I have a tank 30 in. by 15 in. by 15 in., in which I have plenty of growing water plants and a number of goldfish. The water keeps clear for a couple of months and then suddenly goes all foggy and white. Why is this please?

I suspect that the white fogginess is caused by Infusoria. The Infusoria are encouraged by decaying uncooked dried food as a rule. If a little of the water could be placed under a microscope at this time thousands of tiny creatures would be seen moving around. When this state occurs most of the water can be removed and plenty of the mud from the bottom of the tank. Refill with fresh water and do not feed again for about 3 days. Often the water will clear if all feeding is stopped. Take care with the amounts of food given during cold weather, as the appetites of the fish will be decreased considerably during such times.

I have a garden pond about 9 ft. by 9 ft. and 2 ft. 6 in. at one end, running shallow at the other. I have a number of goldfish which have lost several during the winter. I covered up part of the pond with a fence and plenty of banks and the water never froze at all but did so fairly solidly at the shallow end. I lost several shubs and goldfish and golden orfe; the largest ones suffered the worst. Could I install a heater to save this happening in future years?

I think that the covering of the pond was a mistake. I have found that if the water is darkened in any way, either by coverings or by snow lying on ice, the water underneath becomes very foul. I am sure that it is not the cold which kills fishes in a frozen pond but the fact that the water is over-charged with foul, poisonous gases which are trapped under the ice and cannot escape; also fresh oxygen cannot then get into the water. Your larger fishes suffered the worst because when there is a deficiency of oxygen they are the first to die, since they need more oxygen than smaller ones. I have not lost a single fantail goldfish in my pond, which was frozen over about 6 inches thick for several days. I cleared the snow from the ice and made a hole with a water can filled with boiling water. I then slightly lowered the water and this meant that the whole surface of the water could get in touch with any foul gases and take in fresh oxygen. You could install a heater but in a pond the size of yours all that would happen is that you could keep open a hole near the heater, which could, of course, be done each day by the method I have described. One of the best methods of ensuring that the fish come to no harm under ice is to see that the water is fresh and pure at the beginning of the winter by cleaning out the pond and refraining from overfeeding during cold weather.

I would like to get a container in which I could keep a large number of goldfish. Have you any suggestions?

There are many kinds of containers which could be used. You apparently do not want a concrete pond, but there are several plastic ponds of various sizes from which you could choose. Then there is always the discarded bath, which is easily converted into a goldfish tank. On a smaller scale there are coldwater cisterns, which can be suitably cleaned, made water tight and cemented over. I treated a number of such tanks many years ago, before the last war in fact, and they are still holding water and fishes with no trouble.

I am a coldwater breeder of good stock of shubnikovs and goldfish and would like to take up orandas. Can you please recommend anyone who can supply me with these?

I do not like recommending any particular breeder, as conditions vary from time to time and there are not many breeders of good orandas today. My advice to you is to insert a small advertisement in *The Aquarist*, setting out your needs; you should get in touch with the right fishes in this way. If you are able to do so it is a very good plan to attend shows and then find out the addresses of the successful exhibitors of the variety you want.

I recently noticed a hi-go carp in my pond which had one of its eyes protruding. The eye appeared undamaged but was about half-way out of its socket. I have some goldfish, shubnikovs and golden orfe in the pond. Do you think that any of these could have caused the damage?

The fishes you mention would not normally attack the hi-go, although the orfe might have done this as they are a very quick fish and hearty feeders. Its eye may have been damaged by any rockwork or even against the concrete side of the pond. There is little you can do for the fish. Even if the eye is lost it is quite probable that it will live on apparently unaffected by the loss.

Could you tell me how to get rid of the blanket weed in my pond? Last year it covered all the pond plants. I believe I introduced it into the pond with *Ludicra*.

The blanket weed can be removed from the pond by twisting a broken stick into masses of it. Much of the weed can be removed this way. Some can be pulled out by hand. You must tackle it as soon as possible before it gets a good hold in the summer months.

I have a male and female goldfish in a tank 36 in. by 18 in. by 18 in., and the female appears to be about ready to spawn, but the male does not. Do you think she is ready to spawn and should I remove the male to another tank for a time? The room is centrally heated.

I do not think that you will have much success at breeding goldfish in your tank. It is too small for the purpose. Any of the eggs could be eaten and even if some escaped the fry would be eaten by the parent fish soon after they hatched. Try to get a tank 24 in. by 12 in., by 12 in. at least, when the fishes will have more room to swim about and possibly breed.

*Continued on page 51*
Around the Aquariums with MIKE SHEEDY

The trout fishing season has just started. Many keen trout fishermen are going to the west coast fishing on the brown or rainbow. But if you prefer to do your fishing in the quiet way, Bristol Zoo Aquarium may be the place for you.

For here a family of two dozen fine rainbow trout are settling down in a quiet pool at the bottom of a large glass-fronted tank in which they live. The big fish have been housed for some time, but the small ones, which are not yet fully grown, are just beginning to show their colour.

The tank is not large, but it is deep enough to allow the fish to swim around freely. There is a good deal of shade provided by the glass walls, which protect them from sunlight and help to keep their bodies cool. The water is constantly aerated by fountains, and the temperature is maintained at a suitable level.

The Bristol Aquarium is open to the public every day except Sundays from 10 a.m. to 4 p.m. Admission charges are modest and the facilities are excellent. It is well worth a visit for both children and adults who enjoy looking at fish and other marine animals.

Belle Vue, Manchester, offers some sparkling exhibits in the new Aquarium and Reptilian this season. These range from giant turtles more than 150 years old to the fantastically colourful and quaintly shaped fishes of the coral reefs. The marine show is an astounding experience to the visitors. A unique feature of the Aquarium is the jungle pool setting. Visitors cross the pool by a wooden footbridge from which it is possible to gaze down on crocodiles and alligators, all in complete safety.

Any readers of The Aquarist who visit Belle Vue this year will not be disappointed by the tropical fish display, which I think is one of the finest in the country.

At Pain's Garden (Zoological and Botanical Gardens), Ashover, Derbyshire an entirely new approach to labelling fishes on display has been put into practice. A large coloured model of the species concerned surmounts a great deal of detailed information about it, and this approach serves a dual purpose: (a) it provides a sure means of identification where several species are confined in one tank and (b) as models "larger than life" they show great detail not normally noticed—in fact they may almost be said to be under the microscope.

Readers' Queries Answered

(continued from page 50)

I have an old bath tub in the garden for a pool and it has become overgrown with plants. Can I clean it out now and put in new fish? I would like a water lily when I replace the plants.

You can clean out the pool any time during the spring. You will only be able to have a small water lily as the bath is so small. The fishes should be all right in the tub provided that the galvanising is not new.

I have a coldwater tank which is infested with Hydra. How can I get rid of them?

It will not be easy to get rid of the Hydra whilst you have fishes in the tank. The usual way is to raise the temperature of the water to about 70°F (21°C) and add some ammonium sulphate dissolved in water. A quarter of an ounce to a 24 in. tank will do. The fishes will have to be removed while this is being done.
our readers

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.

Starting Right

Although I enjoyed the article (The Aquarist, April) "Starting right with the Aquarium", I am not too agreeable with the title. It would appear from the photograph (3) that the permanent position of the tank is on top of a refrigerator (I may be wrong). This seems to me to be a very undesirable location when bearing in mind that the motor of the refrigerator is regularly switching on and off automatically. The sudden noise and vibration would surely frighten the fish, especially during the night when everything is quiet.

G. E. Smith
London, N.5.

We agree that a refrigerator top would be a bad permanent site for an aquarium. The aquarium depicted was, in fact, moved to an aquarium stand before filling was completed—Editor.

School Aquarium

I read, with interest, the comments of Mr. T. Rolan in his letter in the April issue. Having removed pennies, old ball-point pens and lumps of soil from school aquaria, as well as the occasional unfortunate dead fish, I must agree that a non-opening tank top would be ideal. Even in the class laboratory, when the teacher's attention is diverted during practical work, it is easy for the unwatched pupil to add to the tank anything from the above to half a tin of dried food. Can any readers suggest suitable, inexpensive ways of making non-opening tank tops?

Mrs. Carrington's letter regarding the use of a garden hose to fill indoor aquaria brings to mind an occasion when the union of hose and tap became partially unstocked, producing disastrous results in the kitchen.

These are all part of the game of fishkeeping, with its attendant thrills and spills!

B. Whiteman
Larne, Co. Antrim.

Angels on the Move

After experiencing some difficulty in moving large angel fish I now find the following method most successful. Bring the two tank temperatures as near as possible (to a degree or two), then catch the fish with two large nets and transfer straight into the new tank. Last week I moved 15 large anglos into a new 4 ft. tank. There were five of them caught together in the first netting and I am pleased to say only one tail fin was slightly split. This week there are three pairs busily clearing and we trust there will soon be some eggs.

I hope this suggested method will be of future help, as I think that these fish are scared by being placed in a small container.

A. W. Skinner
Birmingham, 24.

Tough Fancy Guppies

I have read, with considerable interest, and a little indignation Mr. Jenno's article "Natural and Planned Breeding" (The Aquarist, March). I wonder whether this article was based entirely on Mr. Jenno's own practical experiences in the development of the strains mentioned therein? While I agree with much he has written with regard to inbreeding, there are a number of points with which I disagree.

Firstly the article gives a very incorrect impression of the methods applied by the fancy guppy breeder. I have been a breeder of guppies to the P.G.B.S. standards, for 8 years, and have had considerable success in the development of new lines, and on the show benches throughout the country. I have never used this continuous close inbreeding, which he so rightly states "is against all the laws of Nature!"

Mr. Jenno states that "fancy guppies and many strains of fancy goldfish are sluggish and inactive and cannot stand cold weather as the common goldfish can"; surely the author is a little confused? The former being a tropical species, there can be no comparison between them. I would suggest that Mr. Jenno refers to the series of articles by Peter Dendy, entitled "The Guppy, King of Tropical Fishes", published in The Aquarist commencing June, 1960.

To illustrate the toughness of this modern line-bred guppy: on 1st March, 1964, I travelled from Birmingham to Glasgow taking along some of my best exhibits in glass show jars, and packed in insulated boxes in the boot of an unheated car (cruising at 80-90 miles per hour), I would imagine it was, to say the least, a little draughty back there?

I lodged the fish at a friend's fish house overnight.

THE AQUARIST
An Apology

On the front cover and on page 209 of the March, 1965 issue of *The Aquarist* a photograph was reproduced which we now know to be the subject of copyright held by T.F.H. Publications Inc. of Jersey City, U.S.A. The use of this photograph without acknowledgement is regretted, and the Editor and publishers of *The Aquarist* apologise for any inconvenience caused to the copyright holders.

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**The AQUARIST Crossword**

Compiled by M. W. SAUNDERS

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**CLUES ACROSS**

1. Most commonly, the willow (7, 6).
2. Trapezius pulcher (6, 3).
3. Special for maintaining water temperature (6).
4. Morning glory, arising soon after the sound of (8).
5. Description of STT pipe (6).
6. A year in school mostly (6).
7. Fish kept from Montevideo (6).
8. A summer? (5).
9. Common name for Abramis bicolor (9).
11. To go on, might leave cancer with an empty ending (7, 5).
12. Poison water nymph, invertebrate (7).
13. Part of a circle (1, 3).
14. Agreement which began yesterday (3).
15. Might give you a lift (5).
16. Common fish name (5).
17. Description of a cookery's show? Something fishy here? (7).
18. Description of a certain type of herb (4, 7).
19. Whose spoken, may be plural in all (6, 8).

**CLUES DOWN**

1. For 24 down, these have slipped out of fashion (7, 8).
2. Useful for catching crabs? (5).
3. If this painting would Yoga? (7).
4. The building variety, maybe (7).
5. Belonging to you and me (3).
6. Might give fish a tail in a tank? (5).
7. After you and me (5).
8. Common name for Astyanax fasciatus (5).
9. Signature completion (5).
10. 14 down to a seahorse (5).
11. Four part (3).
12. A short ascent from the stage at this time (5).
13. Occasionally mummified in fishes (5).
15. Looking in—at your tank perhaps (7).
16. But you trust it down for this (5).
17. The downhill French fish entry in gnomes-like (5).
18.Taken all round, a neat mountain (4).
19. This snail arm must stock up with weapons (5).
20. About some years (7).

Solution on page 56.
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.

THURSO.

Workshop Aquarist & Zoological Society held its annual Open Show recently. This was well supported by the following societies—Beauchief, Geese, Hallian, Haddingfield, Leeds, Nottingham, Southport, and Tunbridge. Judging was done by Mr. W. H. Long, and the winners were as follows:—Chairman S. Beverley; 1st, Mr. M. B. H. Long; 2nd, Mr. G. A. Smith; 3rd, Mr. G. E. Brown; 4th, Mr. J. A. Brown. The results were as follows:—Chairman S. Beverley; 1st, Mr. M. B. H. Long; 2nd, Mr. G. A. Smith; 3rd, Mr. G. E. Brown; 4th, Mr. J. A. Brown.

THE Annual General Meeting of the Isle of Wight A.S. was held recently at the Leuchars Hotel, Hayling Island. The report of the Secretary showed a good attendance, and the business was concluded.

AT the May meeting of the Altrincham and District R.A.S. the programme was well supported and included a sound meeting in two parts about two hours long. Features of the meeting were as follows:—Lecture 1: Mr. W. Brown (Bundall); 2nd, Mr. J. M. C. Williams (Society's Secretary); 3rd, Mr. W. T. S. Price (Society's Treasurer). The meeting was well attended and the reported discussions were very interesting.

THE Harlow A.S. were hostesses to the members of the Epping and District A.S. The programme for the evening was a film show on the breeding habits of certain British fish. The film show was followed by a talk on the breeding habits of certain British fish. The guests were most interested and the meeting was well attended.

AMONG recent events of the East London Aquarist & Pondkeepers Association has been a talk on the care and maintenance of a particular type of Aquarium. This was done most successfully and information was given on what would be required for the success of such an aquarium. The talk was given by Mr. J. R. Smith (Society's Secretary). The meeting was well attended and the talk was much appreciated.
AT a recent meeting of the Tharrock Aquarist Club, the show secretary Mr. R. Jones gave a most interesting talk on breeding the egg-layers and their associated species, and the many interesting variations that can be achieved with the various species and the Jewel fish. The talk was much enjoyed by all club members. Ex-souts are always welcome.

Extension meetings are planned for the near future and are due to be held at the Tharrock Aquarist Club, R. Nicholls, Harlequin, (60 per cent.) Mr. D. O. Davis, Harlequin. (30 per cent.) The club meets on alternate Mondays at 3 p.m. at the Lane Hotel, Gretna.

THE 8th Annual Open Table Show of the A.Y.A.S. was held at Beachley. There was a good attendance and the table was held under the auspices of the A.Y.A.S. and the South Shields Aquarium Society. The judging was done by Mr. R. Nicholls, Harlequin, (60 per cent.) Mr. D. O. Davis, Harlequin. (30 per cent.) The club meets on alternate Mondays at 3 p.m. at the Lane Hotel, Gretna.

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THE results of the county successful annual open show of the Sheffield and District A.S. for which there were 86 entries were as follows: First., J. R. Allen (Norton & District); 2nd., A. W. Smart (Sheffield); 3rd., A. H. Smith (Broomfield); 4th., E. J. Smith (Broomfield); 5th., W. J. Smith (Broomfield); 6th., A. E. Smith (Broomfield); 7th., A. J. Smith (Broomfield); 8th., W. J. Smith (Broomfield).

THE Weymouth and District A.S. was treated recently to an excellent talk on 'Trees and Wind'. This was given by Mr. J. E. Green, President, who brought the topics to light by means of a lantern slide. Mr. Green also showed a slide of a 'Dendrology', and a 'Ferns', and said that the exhibition was held in connection with the Weymouth and District A.S.

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E.C.D.—Early closing day.

BERKSHIRE
The Reading Aquarist
84, King's Road, Reading
Telephone: Reading 53632
E.C.D. Wednesday. R. C.T.P.A.A.

CHESHIRE
Grassby, J., F.R.H.S., "The Glen" Fisheries, Mobberley, Nr. Knutsford
Tel.: Mobberley 3272 W. C.T.P.A.A. R.&A.

DEVON
Plymouth Tropicals
127, North Road, Plymouth
Telephone: Plymouth 62663
Closed Wednesday. R. C.T.P.A.A.

DURHAM
The Fish Bowl
Burdon Road, Sunderland
Telephone: Sunderland 71026
E.C.D. Wednesday (All day). R. C.T.P.A.A. R.&A.
Metcalfe, G. R.
187, Northgate (near Minorities Garage)
(On main A1 road) Darlington
Telephone: Darlington 5991
Powell, M.C.
The Honey Pot,
Claypath, Durham City
Telephone: Durham 2108

ESSEX
Goodmayes Aquarium
70 Grove Road, Chadwell Heath
Telephone: Goodmayes 2594
E.C.D. Thursday. R. C.T.P.A.A.
Skilton, C. J., Aquarist
139, Gallywood Road,
Chelmsford
Telephone: Chelmsford 56878
E.C.D. All Day Saturday. W. C.T.P.A.A.

GLOUCESTERSHIRE
Patricia Prece (Prop. Mr. B. R. James)
10, Suffolk Parade, Cheltenham
Telephone: Cheltenham 24049

HAMPSHIRE
Arunel Aviaries & Fisheries
241/243, Arundel Street, Portsmouth
Telephone: Portsmouth 20047
Bridgemary Pet Stores
56, Greengate Avenue, Gosport
Telephone: Fareham 4781
E.C.D. Wednesday. R. C.T.P.A.A.

Wingate Zoological Supplies
7, Market Street, Winchester
Telephone: Winchester 2405

KENT
Kingsfisheries Aquarium
136, Croxdale Road, Beckenham
Telephone: Beckenham 3716
E.C.D. Wednesday (all day). R. C.T.P.A.A.
Medway Aquariums
314, Canterbury Street,
Gillingham
Telephone: Gillingham 52158
E.C.D. Wednesday. R. C.T.P.A.A.
Sherwood Pet Stores
(Proprietors, Fairbairns Aquaria, Ltd.),
262, Sherwood Park Avenue, Sidcup
Telephone: Bexley Heath 7217

LANCASTHIRE
Horshay's
Trafford Bar, Old Trafford,
Manchester, 16
Telephone: "Trafford Park" 2989
Liverpool Aquaria Company
23, St Thomas Street, Whitechapel, Liverpool, 1
Telephone: Central 4891
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LONDON (East)
Wade Aquatics
333, High Street North,
E.C.D. Middlesex, E.12
Telephone: Grangewood 6333

LONDON (North)
The Aquarium,
2, Gatcombe Road,
London, N.19
Telephone: Primrose 1842 and 9452

LONDON (South)
Fairbairns Aquaria, Ltd.
15, Well Hall Parade, Etham, S.E.9
Telephone: Etham 5659
Petish
254, Garratt Lane, S.W.17
Telephone: Lakeside 2809
Closed Wednesday. R. C.T.P.A.A. R.&A.

THE AQUARIST
South Western Aquarist
2, Glenburnie Road, Trinity Road,
Upper Tooting, S.W.17
Telephone: Balham 7334
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West Ealing, W.13
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Owen Reid's, Aquarium Dept.
12, Spring Bridge Road, Ealing Broadway, W.5
Telephone: Ealing 3259
E.C.D. Wednesday.
WR. C.T.P.A.A. R.A.A.

NORTHAMPTONSHIRE

The Aquarium
192, Wellington Road,
Northampton
Telephone: Northampton 34610
E.C.D. Thursday.
R. C.T.P.A.A.

The Pet Shop
120, Kettering Road,
Northampton
Telephone: Northampton 58941
E.C.D. Thursday.
R.C.T.P.A.A.

OXFORDSHIRE

The Goldfish Bowl
9, East Avenue, Cowley Road,
Oxford
Telephone: Oxford 41825
E.C.D. Thursday.
WR. C.T.P.

STAFFORDSHIRE

Walsall & Wolverhampton Aquatics
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SURREY

Aquapets
1, Grand Parade,
Tinworth
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R. C.T.P.A.A. R.A.A.

Thameside Tropicals and The Pet Shop
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Walton-on-Thames
Telephone: Walton 24076
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Brighton
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WARWICKSHIRE

The Coventry Aquarist (Prop. W. Dymond)
43, Melbourne Road, Bartlom, Coventry
Telephone: Coventry 72772
E.C.D. Thursday.
WR. C.T.P.A.A.

WORCESTERSHIRE

The City Aquarium, Bird and Pet Supplies
(Proprietor: Mrs. M. Hemming)
34, Priory Street (opposite Union Street), Worcester
Telephone: Worcester 22005
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R. C.T.P.A.A. R.A.A.

YORKSHIRE

The Corner Shop (Prop. P. Wilks)
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Telephone: Sheffield 54172
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SCOTLAND

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Telephone: Dundee 60409
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<tr>
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<td>6d. each</td>
<td>1/- 12/-</td>
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<tr>
<td>RED CABOMBA</td>
<td>6d. each</td>
<td>1/- 12/-</td>
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<tr>
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<td>4/- each</td>
<td>5/- 5/-</td>
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<td>1/- 1/-</td>
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<td>PALEATUS CATS</td>
<td>4/- 4/-</td>
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<tr>
<td>CHINESE RASBORAS</td>
<td>2/- 10/-</td>
</tr>
<tr>
<td>STRIPED CICHLIDS</td>
<td>3/- 4/-</td>
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<tr>
<td>FIREMOUTHS</td>
<td>3/- 4/-</td>
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<tr>
<td>BLUE ACARAS</td>
<td>3/- 4/-</td>
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<tr>
<td>FLAG FISH</td>
<td>4/- 4/-</td>
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<tr>
<td>ZEBRAS</td>
<td>2/- 4/-</td>
</tr>
<tr>
<td>PEARL DANIUS</td>
<td>2/- 4/-</td>
</tr>
<tr>
<td>BLACK WIDOWS</td>
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