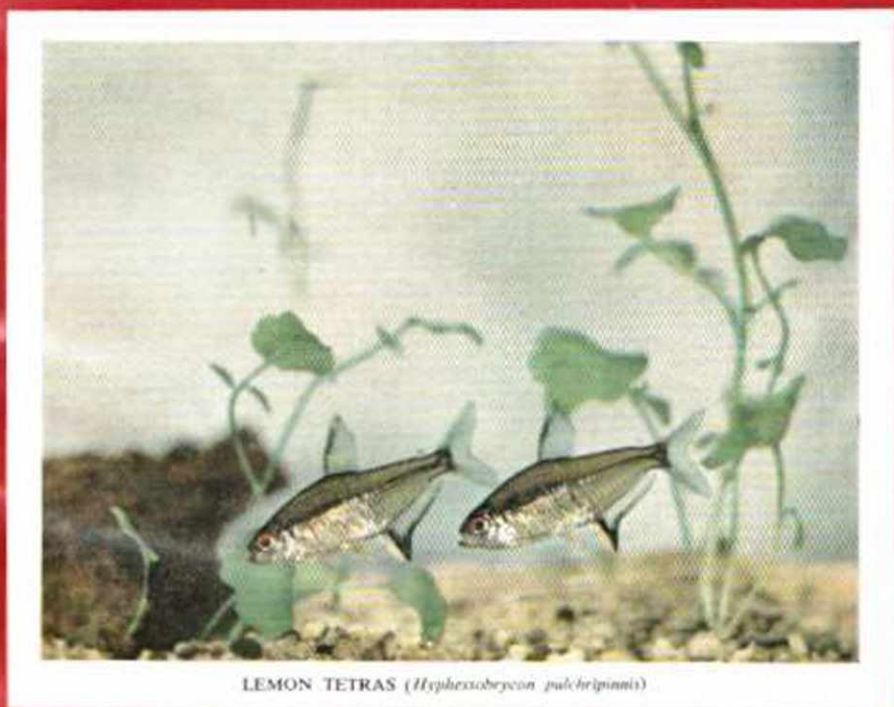


November 1957

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PRINCIPAL CONTENTS

Opaline Gouramies

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Lemon Tetras

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VOL. 13 NO. 1
NEW ISSUE
NOVEMBER 1957

FISHKEEPING

and Water Life

IN THE SWIM

Black Lacetail Guppies - Jaant for
Tortunes - Twenty-one Years - New World
Zoo - Tropical Louches Bred
Furnished Aquarium Trophy

• New Guppy Colour. Among over 150 guppies received from the Continent for the Guppy Federation's annual show were some interesting Half-black Lacetails. The rear part of the body from the dorsal fin backwards was black, whilst there was a gold-face pattern on the dorsal and tail fins.

• Black atom bomb. The mighty atom bomb has been held responsible for inclement weather and a whole host of other misfortunes. Latest news is that Black and Black Lace Angel Fish arose from this weapon's influence—a notion which we believe can be dismissed.

• The effect. D. Nichols of Southsea, Hants, likes his decorative aquarium to look as attractive as possible, and with photographs and an article on page 13 shows how readers can emulate his idea. We should like to hear from others who have cabinet aquaria of which they are proud.

• New approach. This journal, now a monthly, and with the more direct title of FISHKEEPING AND WATER LIFE, comes to you in its new dress. Continual efforts will be made to cater for the interests of fishkeepers and herpetologists. Already many readers have welcomed the advance, but we should also value your comments on how we can serve you still more completely.

• Ancient Advance. Four Giant Tortoises at Whipsnade Zoo recently decided to have a look at England, 1957. One—less intelligent than the others, we would surmise—took up a position outside the Superintendent's office, whilst the others dived the road surface looked inviting. A traffic jam resulted from their want until keepers came and lifted them back into their enclosure and mended the wire fence through which they made their escape.



Life slows down at Whipsnade as escaped Giant Tortoises laboriously cross the road.

• Calm view. Twenty-one years of untroubled existence has been the distinction of Belle Vue (Manchester) Aquarium Society, and it gave me great pleasure to be present as a guest for the club's 21st anniversary Dinner on September 27. Many aquarists from bordering clubs came to celebrate with Belle Vue on this landmark in its history.

Dr. Wilkinson, the President, spoke of the hobby's post-war boom period when membership...

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ship of Belle Vue had been restricted to 150 and, as a result, other societies had been formed which were represented at the Dinner. This successful process of decentralization in Manchester was due almost entirely to the Belle Vue society's decision.

It is doubtful whether any other club has had only two secretaries in 21 years, but such is the case with Belle Vue, and Dr. Wilkinson described them as "pearls of great price".

● **To Canada.** There came a moving moment as Gerald T. Iles (secretary since 1941) received a gold watch on vacating his position in the society. In early October Mr. Iles left for Canada to become the Director of the Montreal Zoological Park, the building of which he will supervise. Mr. Iles emphasized that he was not leaving Britain because he was fed up with it; "There is nothing wrong with this country," he said, and he hoped to return periodically. Mr. Iles is presented with a venture having wonderful possibilities. He will be responsible for building the zoo from the very beginning, and it will include an Aquarium.

● **Kuhlis bred.** Kullis Loactes (*Acanthoplatanus sovieticus*) have tested the skill of aquarists for a long time. Mrs. Johnson (Johnson's Aquarium) has now had some success—not precisely accidental, nor exactly premeditated. Two dozen Kullis were moved



G. J. M. *Tiranoceras* picture of the tropical loach, *Acanthoplatanus semicinctus*.

to an aquarium in the shop some six weeks after they had been imported. The tank they occupied was shared with Schuberti Barbs and *Pseudorasbora kribensis*. Cichlids and was heavily planted with *Cryptocaryne hercyniana*. Water was from the tap, at a temperature of 76-78 deg.F., and the aquarium received morning sunlight.

Some time later 12 youngsters, one inch long, were noticed. It was then recalled that after the Kullis were put in they had stayed in a colony for about a week at the back of a tank

near a *Cryptocaryne*. Pairs of the adult fishes now (mid-October) shanny and roll over, and maybe this is the spawning action for, although no eggs have been seen, the Schuberti Barbs nose down into the gravel immediately, possibly in pursuit of a fish egg delicacy.

The Schuberti Barbs and *Kribensis* are to be removed so that the Loaches have a chance of breeding further. The pH is 7.1, and the hardness—Jegres, 17. Present information suggests that the idea they build a bubble nest for the eggs is untenable. No bubble nest was seen and it seems extremely likely that, had the eggs been laid in such a position, the Schuberti Barbs would have made short work of them.

● **Club trophy.** A new trophy will be competed for in the Aquaria Section of the National Exhibition of Cage Birds and Aquaria on January 9, 10 and 11. It will go to the best club exhibitor furnished aquarium whilst the existing WATER LARK Trophy will be awarded for the best interclub tropical aquarium.

Schedules for the exhibition should be in the hands of all clubs and known exhibitors, south of a line from Barrow to Scarborough, by now. If others outside this area would like to have copies, application should be made without delay.

Classification details were given in the last issue; the closing date is Monday, December 2, and a highly representative entry is anticipated.

● **Gourami affliction.** No adverse reports have been heard in this country about the Opaline (Cosby) Gourami referred to on page 15. In fact, by and large, it has been accepted as a rather more attractive fish than the existing WATER LARK Trophy. Gene Wolfheimer, of California, however, has found that the fish is susceptible to an unusual complaint, apparently not contagious, in which it appears that chunks of fish's body have been removed. There is no evidence of Fungus, and healthy fishes get over an attack, regrowing the affected areas.

● **The year through.** Twelve thoughtful reminders to a friend or relative will be your reward for taking out a year's subscription to FISHKEEPING AND WATER LIFE. Begin with the December issue and your gift will commence in time for Christmas. The cost is £1.8.0, which should be sent with the recipient's name and address.—L.W.A.



FISH OF THE MONTH LEMON TETRAS

A species with decorative possibilities

RATHER less ostentatious in its colouring than some other Characins, the Lemon Tetra (shown on the front cover) is nevertheless one of the best of the smaller tropicals for a decorative aquarium. Its body is a gold shade with very nearly a transparent quality but high spots are a red upper iris to the eye with a gold tint below and particularly distinct yellow colour along the front edge of the anal fin. Throwing this strip of colour into relief is an area of black immediately behind it in the anal fin. The dorsal fin has a black front edge and may be tipped yellow.

Lemon Tetras look best in a small shoal and in an aquarium with other fishes of comparable size, especially other Characins which are not too brilliant in contrast, but whose dominant colours help to throw up the lemon tint of this Tetra.

The species is entirely peaceful and easy to maintain. In the wild it is reputed to grow to 1 1/2 in. but under aquarium conditions, 1 1/2 in. is more usual. It is lively and appreciates livefood although it will take dried food preparations.

As with the majority of Characins high temperatures are not needed nor even appreciated. The lower seventies are the best with an increase of 5 degrees or so for a breeding attempt. There is no certain way of differentiating between the sexes except that a mature female is fuller bodied.

Lemon Tetras are notorious fish egg eaters—including their own—and dense thicket of a fine spawning medium in a 6-7 in. depth of water are required for the breeding aquarium. Even then the parent fishes must be taken out as soon as pairing has taken place. The eggs are small and transparent.

The newly-hatched fishes, once their yolk-sacs have been absorbed, are fed on microscopic food gradually being weaned on to Brine Shrimps, sifted *Daphnia* and Dwarf White Worms.

Lemon Tetras come from the Amazon Basin and deserve greater popularity than they enjoy at present. The only apparent reason for their restricted circulation is their delicacy of colour compared with the flamboyance of some other species.



Magnificent Epiphyllum cactus former photographed by L. E. Perkins.

CACTI FOR THE FISHHOUSE

Jungle types suit humid conditions

by ERIC R. JONES

FOR some time now I have been asked the same question over and over again about cacti rotting off in the humid fishhouses of my aquarist friends. The question is, "Why, after very careful attention not to overwater my cacti, do they always rot?" About 10 per cent of this trouble is due to disease and the wrong soil mixture but, if the cacti are bought from a reputable trader, this is overcome from the start. The other 90 per cent of the trouble is due to the wrong type being grown in the fishhouse.

There are two main sorts of cacti in the world—they are the desert cacti and the jungle cacti. The desert kind are usually the more grotesque and more heavily spined and this is due to their environment. All desert species have to overcome long periods of drought and, to do this, they cut evaporation down to a minimum. You will notice that the total surface area of desert cacti compared with their volume is very small compared with that of the other plants; this explains why desert cacti are either globular or cylindrical in shape. Also, if the surface layer of desert cacti is examined under a microscope, it will be found that the stomata (these are the pores through which any plant respire) are very small, and the epidermis (the skin of a plant) is very thick. The spines of cacti have a two-fold purpose—to protect the plants from the hot sun and thirsty animals.

To grow any plant successfully it is necessary to try and imitate its natural living conditions and therefore to grow desert cacti, which come from the hot, dry and arid regions of the

world, in the sometimes cold, humid and poorly lit fishhouse is a slow death for them.

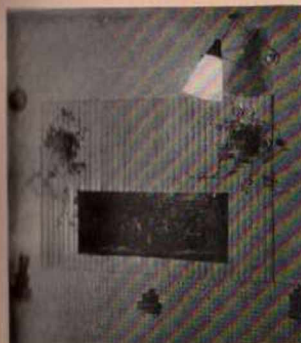
In this article I am, of course, referring to fishhouses which have a very humid atmosphere when the immersion type of heater is used.

However, some aquarists use various forms of space heating which do in fact dry the air considerably and so make it possible to cultivate the desert forms of cacti very successfully, unless fumes are present. Desert cacti may also be cultivated in a south-west facing window sill in the house or in a greenhouse, preferably heated.

The cacti which grow very well in the humid fishhouse are the jungle sorts. They grow where there is an abundance of water, shaded conditions and a moist atmosphere. They either grow on tall trees or on the ground and climb up the trees.

To recognise jungle cacti, look at the spines. Jungle cacti have either very small, harmless spines or none at all. Their surface area, compared with their volume, can be very large. They tend to grow much more quickly than desert cacti, though they are not fast growers. Their flowers, which easily form when the plant is only two or three years old, are comparatively large compared with those of desert types.

The Genera I would recommend for the humid fishhouse are *Rhipsalis*, *Pseudorhipsalis*, *Hattoria*, *Zylocactus*, *Epiphyllum*, and *Selambergera*. Do not be put off by the names, any nurseryman will help you out with them and they are certainly worth growing as a decoration for the fishhouse.



Do it yourself

A beautiful recessed aquarium

by DONALD NICHOLS

PHOTOGRAPHED here is a recessed aquarium which was made to fit in the chimney breast of our large living room. Such an arrangement might also be effected in the room of a room. In our case we found that one coal fire, plus an electric heater at the other end of the room, was quite adequate for maintaining the aquarium.

First, the fireplace surround was removed and then we bricked up to 28 in. from the base level. Two lengths of bed-iron were placed horizontally to support the tank and set out the chimney with hardboard and set the background for the tank out of hardboard 4 in. longer than required. We then posted an imitation rockery paper on to this when forced into the chimney breast this background gave a bowled effect, thus adding depth to the tank. Black paper was used in the aquarium sides.

On the right-hand side of the chimney breast we placed the electrical wiring on a block. The light shade and necessary fittings for the lighting were screwed to the hardboard wall in back the chimney.

With the tank in place the sides of it were insulated with a cotton wool/papiermâché material. We then mounted a piece of peg board the width of the chimney breast and 28 in. from the floor. At the top right-hand corner of the board we inserted a press button switch to control lights.

For the fascia panel around the tank corrugated hardboard was used. On the right-hand corner a small square 6 in. x 4 in. was cut out and put back again on hinges. This gave just sufficient room through which to feed the fishes. When servicing the tank there are four screws, one in each corner, to be removed and access to the tank is gained.

I have wired plant holders containing plants for extra effect around the tank and one of these gives excellent cover for the little feeding door. Cacti, also on wire fittings, are placed on the peg board beneath the aquarium.

With the fascia board removed there is ample room for servicing the aquarium.



IMPORTATIONS OF MERIT

Star rating for a number of tropicals new to Britain

by P. MILLET

SEVERAL interesting consignments of fishes have reached this country in recent weeks, and though many of the species are known by repute to aquarists, most of them can be regarded as "new" fish insofar that they have been seen only in the tanks of the favoured few, or in public aquaria.

Reviewers of new films, and compilers of road-books have a tradition of using from one to five stars to indicate their approval of the qualities of films or hotels, and one feels that some similar indications of a fish's worth as an aquarium inmate would be as valuable to a reviewer of new fishes, so if one may borrow this convention five stars should be awarded to *Rasbora steineri*, pictured and mentioned by R. Skipper on page 18. It appears similar in appearance to the fish described as *R. boreopetala*.

Here we have a "new" fish with most of the virtues demanded by the aquarist of discernment. Discovered by science as recently as 1927, this newcomer shares with the White Cloud Mountain Minnow the distinction of coming from China.

For a new fish it is cheap (under 10/-). It is active and will stand a wide temperature range. Its maximum size is three inches and it offers fair challenge to the serious aquarist, in that it has not yet been bred. Definitely a five-star fish!

Fish from the Middle East

Another country that sends us few aquarium fishes is Persia, so a new importation of the rarely seen fish *Aphanius sophia* is welcome. This fish is often read about, but rarely seen in traders' tanks.

The male is an extraordinarily pretty fish when in breeding condition, and an American authority classifies it as one of the most beautiful spotted aquarium fishes there are. It can be bred, but must have up to 20 per cent sea-water, or its equivalent, to ensure success. Though it does not exceed two inches in length its temperament is bad, so being a poor mixer one regrettably has to award it a meagre two stars.

Another two-star fish offered as a new *Rivulus* species has several attractive features.

It is new and, though reminiscent of *R. ocellatus*, has much more colour even in new, imported specimens not necessarily seen at their best. It has a gold sheen over the body and posterior end of the tail fin, a beautiful gold iris to the eye, and red spots all over the body. The top and bottom of the caudal fin, and the dorsal and ventral fins respectively, are edged with black.

The sexes are easily distinguished since the female shows the typical "Rivulus spot" on the tail. Specimens seen have been about two inches in length, and the species does not appear to be such a wild jumper as many of its relatives.

An Armoured Catfish

Four stars should be awarded to *Corydoras barbatus*. Although this Catfish is illustrated in at least one aquarium handbook, it has not before been available in quantity in this country. Like many of the group it has not been bred, and there are no outward sex distinctions. It reaches a length of five inches which is larger than many *Corydoras*, but it still remains a good community fish for the larger tank.

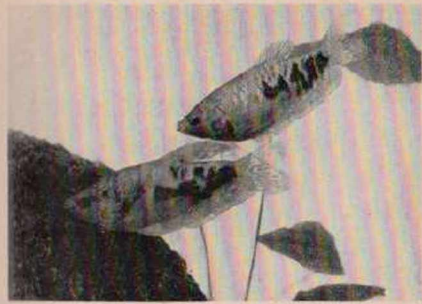
It is very handsome and, while reminding one of *C. paleatus*, it is much more boldly marked with clean-cut patches of gold and brown. *C. barbatus* has a more pointed snout than most of the Catfishes, and is also "noisier" for its most outstanding quality is its movement. Although it does its scavenging duties on the bottom of the tank it spends much of its time in mid-water, and is more active, perhaps, than its small cousin, *C. hastatus*, in this respect.

Although our aforesaid film and hotel critics are always definite in their awards, I should like to reserve judgment on a fish that might prove to be a galaxy of stars if our breeders are on their mettle, but might equally blaze up for a short time and then fade out altogether. This "starlet" is one of our oldest fishes in a new guise. The Veilluiled Angel.

This fish has an interesting history, but at the time of writing much remains to be learned, but I hope to add more next month.

Fishkeeping

Success with the new Opaline Gourami



(Gene Wolf) colour photograph

This colour variation has proved rewarding in the breeding tank

by MICHAEL WATSON, B.Sc.

LABYRINTH fishes and their breeding have been my almost exclusive fishkeeping interests since I took up the aquarium hobby and, having bred most of the more usual types, I am very keen to try the less well-known varieties. The articles and photographs of the Opaline Gourami, which have appeared from time to time, led me to long to possess some of these distinctive fish, and when I first saw them mentioned in this journal I decided that some of the first importation would be a "must" for my fishroom.

After several long-distance telephone conversations it was arranged, and a couple of days later I waited at the railway station for the post to unload a parcel marked "Tropical Fish—Do Not Delay", "To Be Called For". They were beautifully packed in a polythene bag enclosed in a thick insulating layer of sawdust in a stout cardboard box and, when I got home, the temperature of the water in which they had travelled was still 74 deg. F., in spite of it being a chilly day in the middle of

April, and of their having been on their journey at least five hours.

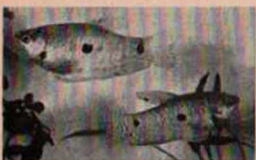
After equalising the temperatures I placed the six Opaline Gouramis in a 15-gallon, well planted tank, and stood back to admire them. Apart from being a little hollow-bellied they looked well and fit enough and were not at all shy and retiring. They were about 1½ in. long and their ground colour was a rich blue—slightly deeper than that of the normal Blue Gourami—with heavy markings of black.

I fed them sparingly on *Tubifex* and then left them to rest overnight. The next day I began a regular three-daily feeding routine, giving wheat-germ dried food for the first feed. The midday feed was of either proprietary dried food or a livefood, followed by *Daphnia* or *Tubifex* in the evening. They all thrived on this diet and began to grow rapidly, the sexes becoming distinguishable in about 10 days. I found that I had four males and two females. The sexes were very easily recognisable in the same way as Blue Gourami, i.e. by the differing

Fishkeeping

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A closely related variety to the Opaline Gourami is the Blue Gourami shown here. The male is the lower fish of this mature pair of fishes.

shapes of the dorsal fin. The two females I removed to a separate tank, leaving the four males together. I still continued the same feeding schedule.

After another week or so, two of the males looked larger and better coloured than the rest, and so I removed the smaller two and placed them in a 50-gallon tank containing an assortment of Labyrinthine of many species. By the end of June the two males left in the original tank were displaying to each other and then one started to build a somewhat scattered nest in the back, left-hand corner of the tank.

I removed his companion to the community tank and decided to try my luck at spawning the new fishes, for the two females were both looking plump and full of spawn. They were, as has since become apparent, almost full-grown, being approximately 2 in. long, while the males were about 1½ in. larger, and when in breeding condition the black markings of the males seemed to spread until the fish were almost black, with beautifully variegated ventral fins and tail.

The water was seasoned tap water about a month old and had been slightly acidified to bring it to pH 6.8. It was soft (about 50 p.p.m.) and at a temperature of 82 deg. F. This time I was trying a new (for me) scheme of having a sub-sand filter operating gently all the time, both to try to keep the water more healthy and to do away with the normal large temperature difference which I found between the surface of the water and the bottom of the tank. I hoped that if the temperature was even all the way down, then the fry might feed at all levels instead of only at certain depths. Another trouble I had experienced before was the overheating of the very top layer of water by the lights which, owing to the canopy design, were not separated from the water by a glass, and so had quite a strong heating influence.

I found that the filter did indeed cure these

troubles. It also meant that I could feed the young fishes much more heavily without the risk of pollution and without having to siphon off the accumulated muck from the tank bottom every other day, which I had never believed to be good, as it disturbed the fry.

The remaining male now had a somewhat scattered nest about the size of my hand and I introduced one of the females into the tank late one evening and almost immediately turned off the lights. Next morning the pair were fed at 7.0 a.m. on livefood and, when next I was able to visit them, about midday, the spawning had taken place and the female was hiding in the thickets of *Cabomba* whilst the male was busily adding to the nest. I removed the female and examined the nest more closely; it was a scattered affair, only one bubble thick all over and with clear patches in it.

However, there seemed to be a good number of eggs, so I left the male to his task, turning off the large light and leaving only the 25-watt bulb burning during the day, but no light at all at night. By the next day the nest was enormous, still only one bubble thick, but covering fully half of the 24 in. x 15 in. water surface. If I approached the tank the male would dash threateningly up to the glass and wait there, fins spread and following each movement, until I retired.

Free-swimming Fry

In three days the young were free swimming, and I removed the male and added a jar of green water as first food, because the fry were not much bigger than young Dwarf Gouramis and were certainly not capable of taking *Paramecium* at this stage. On the second day I fed more green water and some mixed Infusoria from a fresh hay culture which contained mostly small organisms as is often the case with new cultures. I also introduced a small glass jar into the corner of the tank at the bottom and placed one proprietary Infusoria-producing tablet in it each day for the next five days. The tablets dissolve and produce clouds of Infusoria which being positively phototropic swim towards the light and are being eaten by them, and the residue from the tablets remains in the jar whence it can be easily removed.

Feeding from the hay cultures also continued as I like to give the fry a choice of food organisms. After about four days this was replaced by use of an old-established lettuce culture consisting of dense populations of *Paramecium*. After the first week I fed a little egg infusorian and a very little fine prepared food. A week later I began to feed Mikro-worms in small quantities, continuing the

Paramecium in decreasing quantities for the benefit of the more backward fry.

I find the best way of feeding Mikro-worms is to dip feed from a jar holding about a gallon of water. In this way each feed can be spread out over a couple of hours and the fry learn to appreciate this and will congregate under the spot where the drops are falling to grab the worms. This avoids worms getting into the gravel and being wasted. To remove the excess of water introduced by this method and by Infusoria feeding I siphon it out using a length of air tubing with a distributor stone at the end immersed in the tank. This slows down the rate of flow but completely eliminates any chance of sucking out small fry.

When Shrimps were started as the Infusoria were discontinued and for the next week or so the feeding routine was Mikro-worms in the morning, fine dried food at midday and a heavy feed of live Shrimps in the evening. On this diet the young grew apace and first crushed, then chopped, and finally whole *Tubifex* and White Worms were fed progressively.

The spawning was quite large and so, after the first ten days, I decided to distribute the fry into two tanks to give them more room. To avoid damaging the young fish in a net I slipped some out into another 15-gallon tank situated at a 12 in. lower level. If this is done carefully, the fishes are unaffected and I use a long piece of 1 in. rubber tubing and immerse about two yards in the receiving tank so that it is curved round the walk of the tank ribs and the end is pointing slightly upwards and towards the centre. In this way the fry are drawn into the tube from the original tank, passed down the tube and, on emerging, are carried quite slowly toward the centre of the tank and up to the surface without being banged or bruised.

Another advantage of using the sub-gravel filter is that it does away with the tendency for a slight oily scum to form on the water surface, thus eliminating a frequent source of loss when the fry begin to need to breathe atmospheric air, which in the set-up described is likely to be disturbed by the electric lights and is completely protected from draughts by the canopy.

When 1 in. long the young fishes are even more than the adults, the space between the lower black marblines being almost cream on the main length of the body whilst the head and gills are a silver-blue. A shoal of these organisms fits in a space to remember with pleasure and, all in all, I think they are a much more attractive fish than the normal Blue Gourami, being smaller and more peaceful when adult. They breed absolutely true, there being no fish in the spawning which are not exactly true to type.

GLASS ANGELS

(*Gynnocharanda filamentosa*)



(Roy Skipper) photograph

THE Glass Angel (*Gynnocharanda filamentosa* Ladiges), a member of the Family *Amblystidae*, recently reached traders in this country for the first time. Whitwell & Smykała were responsible for the importation and I understand the fish come from Singapore although their exact habitat is not disclosed by the collectors.

The importers state that this fish travels well and should rival the *Ambassis lala* (*Chanda ranga*) for a place in the community aquarium. A pair I purchased were placed in a tank with *A. lala* and very quickly settled down. They were, in fact, quicker off the mark at feeding time than their companions.

The Glass Angel has a transparent body suffused with a delicate golden tone, which reflects a turquoise-blue sheen as it catches the light. Both sexes have an attractive red marking on the nose, but the male alone has the extended rays to the dorsal and anal fins; these are golden in colour and one is reminded of another aquarium jewel that has similar refinements, *Tetraodon lineatus*.

It is quite a coincidence that Dr. Ladiges should be associated with both fishes. The size of the photographed specimen was 1 in. but Mr. G. King (Hendon A.S.) reports having seen 1½ in. long fish in shops in Hong Kong and Singapore.—R. SKIPPERS.

Fishkeeping

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Be colour conscious in choosing tropicals

ONE 24x15x12 in. or 24x12x12 in. aquarium is not much space to play with for decorative effect but a most attractive collection of tropicals can be built up.

An important point to bear in mind is the need for colour contrast. A single red fish, or even a pair, can look most appealing in a trader's tank but take the same fish home, mix it (them) with a dozen different types, and the effect is largely lost.

It is a wise policy to choose four or five fishes of a single type and have five or four of these groups in an aquarium, making a total of 20 small tropicals, an ideal number for the 2 ft. long aquarium. The inmates will shoal with others of their own kind and generally provide a more lively picture.

The only exception to this rule that I would instance among those fish listed is the Catfishes, one specimen being quite adequate. Most common small Catfish is *Corydoras arena*, which is fairly unattractive in colour but, like other *Corydoras*, has the odd distinction of being able to move its eyes and possessing a set of moustache-like barbels. For those prepared to spend a few more shillings there is the Leopard Catfish (*C. julii*) or *C. melanistius*, both black spotted on a light grey background.

Selected in colour groups are the following: Rufe, Red Wagtail Platies (black fins and nose with a red body), Red Platies (entirely red), Flame Fish, Rosy Tetras (red with a distinct black mark in the dorsal fin), Harlequin Fish (pinkish-gold body with black wedge-shaped markings in the rear part of the body), Nigger Barbs (mature males especially

have a rich ruby-red body with heavy black suffusion), Dwarf Gouramies (red markings on basic blue colour, particularly the males), Cherry Barbs (basically red with black markings), Checker Barbs (reddish tinge with speckled black body) and Pearl Danios (mother-of-pearl colouring to the body). Among the Yellow fishes are Yellow Wag-tail Platies, Schubert Barbs (rather larger than the other listed fishes but quite peaceful) and Lemon Tetras (see front cover).

In the Black & Grey group come short-finned Black Mollies (not especially easy to keep in a community but most aquarists have a few), Zebra Fishes (black horizontal lines on the body), Spotted Danios (very similar to the Zebra Fish, but spotted in the lower part of the body and rather smaller) and baby Angel Fish (dark, vertical stripes on a silvery body but only suitable when small).

Both the Black-line Tetras and the Perquin Fish come into the black/grey classification but individual specimens may chase other fishes unidly.

Fishes selected for unusual brilliance are the Neon and its even more colourful relative, the Cardinal Tetra—more expensive at the present time. Glowlights are translucent with an intense but faint blue-white beam on a bright spot on the tail base and the upper iris of their eye is red.

The White Cloud Mountain Minnow, at one time known as the poor man's Neon, is at its best when half-grown. Lastly, and defying classification, is the multicoloured male Guppy.



Roy Skupper photograph

Worn and proprietary dried foods, swims in a shoal in the foreground of a community tank and seems to prefer the upper layers of water. An extremely active fish, it takes food on an impulse but liable to jump when netted or contained in small vessels. This *Rasbora* has revealed no vices and lives peacefully with small fishes.—ROY & GWYN SKUPPER.

Interesting Rasbora

THE fish known as *Rasbora steineri* and possibly the same fish as *R. borapetensis* has been kept by us for a period of several weeks in a community tank and we can report favourably on its characteristics and colouring.

The overall body colour is olive with clear fins. A black line runs centrally the length of the body with a brilliant gold line above it. The sexes are easily distinguished, the female soon assuming a somewhat round appearance (our specimens are about 2 in. long) and the male having a distinctive red caudal fin when in good condition.

The species feeds readily on *Daphnia*. White

by WILLIAM BRAY

Observations on Albino Guppies

by W. G. PHILLIPS

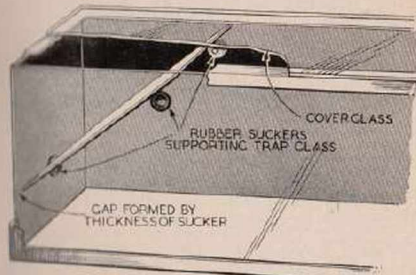
IN November, 1954, I received from Florida several pairs of Albino Guppies believed to be the first that were imported into this country. During the months that followed, I lost most of them and came to the conclusion this may have been due to promiscuous in-breeding. By January, 1955, I had managed to breed a few youngsters from the survivors and from these I selected the best for future breeding. By the end of that year numbers had increased and the quality had improved, but unfortunately an accident occurred in my fishroom when I lost most of my Guppies including all the Albinos, with the exception of one male and one very young female. Later I bred this female to a grey Doublesword male (which I obtained from an outside source.

Later, a pair of youngsters from this cross produced 68 fry in their first brood, including 17 Albinos equalling the theoretical 3:1 ratio, referred to by Drs. Cary P. Haskins and E. F. Haskins in "Hereditability". The remainder of this brood I gave to members of the Guppy Federation. One member, who adopted my method of breeding control, had 56 young fish produced, including 14 Albinos, thus also equalling the 3:1 theoretical ratio.

From the 17 Albinos previously mentioned six pairs were selected for future breeding, and they later produced 369 Albinos in seven broods (see Table 2). The largest broods (a first was 91). This was very nearly the largest I have ever had from a Guppy during the 23 years I have been keeping them. Every little fish was perfect, no "shufflers" and no "angels" amongst them ("angels" are fry that swim around with their head up, whilst "shufflers" are those that shuffle along the bottom).

The smallest brood was 21. The size of this brood may be accounted for by the female having started to deliver her young several days before they were expected and control conditions (placing female in the illustrated trap) were thereby rather late in being provided.

Two of the females, known as A and B, left in their respective tanks, thickly planted, with top cover, etc., and showing every indication of advanced pregnancy, later returned to normal size without any signs of a single youngster. These females later produced broods of 62 and 37, respectively, without further



A fish arrangement which is ideal for breeding livebearers. The gravid female is placed in the bottom formed by the glass sheet and her young fall through the trap to the bottom out of reach of the mother. The back and sides of the aquarium are blacked out and this keeps the fishes happy.

contact with a male, after being placed in the illustrated trap in a clean tank, with no sand or plants, a few days before the brood was expected. The whole tank was blacked out completely with a cloth covering when birth appeared imminent.

There are a lot of misconceptions among

Cross	Number at Week Old		Number at Month Old	
	Black	Pink	Black	Pink
Albino x Grey	22	1	29	4
" "	2	21	2	29
" "	3	26	1	22
" "	4	29	2	28
" "	5	24	2	29
" "	6	20	2	18

Average number per brood = 28.6

Table 1, showing the proportion of Albino to normal F2 progeny noticed in matings in planted tanks. Some 172 fish resulted from six broods.

fishkeepers on what constitutes an Albino Guppy. There are different kinds of albinism or gradations of colours in all species but all have one feature in common. They all have pink eyes. Dr. Myron Gordon, the well-known American geneticist, writing in an American journal in 1953*, defines the Albino Guppy as "one that has practically no melanin (black) pigment on its body and none in its eyes".

The Albino Guppy is rather unique in that, apart from the absence of black, the male often retains its chief characteristic colour. Varying pastel shades of pink, mauve, green, blue, yellow or silvery pearl often show through the pale old-gold-coloured body. Many have fins as bright as those of any other variety of Guppy.

The females vary in body colour from pale old-gold colour to cream, with clear fins. Some females do tend to exhibit a streak of body colour in the tail fin, but I think this most undesirable from a show point of view and, in any case, it does appear to be transient. The colour in both sexes varies with different fish and according to the amount of reflected light.

Another misconception concerns fertility and viability of the variety. Dr. Whitney, in an American article† on how to raise Albino Guppies, writes: "Many of the females resort all of their fry instead of giving birth. They become pregnant and their abdomens enlarge

* Dr. Myron Gordon, "Inheritance in the Guppy," *Aquarium Journal*, May, 1953.
† Dr. L. F. Whitney, "How to Raise Albino Guppies," *The Aquarium*, October, 1954.

but they shrink slowly back to normal without producing a fry."

It is not uncommon for this to happen with females of other varieties of Guppy than it is with any other of the fancy types. This, in my view, is due to the fact that the Albinos have, so far, not been subjected to the constant mixing and crossing that has gone on with the other varieties ever since they were first introduced into this country, just after the first world war.

Table 1 shows results obtained from six Grey females, produced from the original Albino x Grey fishes earlier referred to. They were bred in the usual way adopted by breeders of livebearers—tanks thickly planted to provide top cover for protection of the fry. Shown also in this table is the difference in the age of the fry when those with pink eyes could be definitely recognized.

The difference in numbers of young produced on each occasion compared with the females kept in traps (Table 2) is convincing enough to show which of the two methods one should

Cross	First Brood		Second Brood	
	Pigmented	Albinos	Pigmented	Albinos
Female A	—	—	—	62
" B	—	—	—	37
" C	—	46	—	67
" D	—	91	Diad	—
" E	Diad	—	—	—
" F	—	45	—	21

Average number per brood = 52.7

Table 2, Albinos kept in a trap produced an average of nearly 53 fish per brood. Compare with Table 1 where broods were much smaller.

adopt. Only the very best, healthy fish should be bred from and their youngsters fed on Brine Shrimp at least four times a day for the first week or 10 days. From then on finely screened *Daphnia* and a little dried food are given.

Finally, I am convinced that insufficient protection for Albino fry could be the chief cause of the poor results recorded by some.



Water garden resulting from nine weeks effort by N. E. Perkins in his spare time. Even at this early stage it has an air of permanence about it.

MAKING A WATER GARDEN

by N. E. PERKINS

Illustrated by Laurence E. Perkins

WHILE breeding of Fancy Goldfish can, undoubtedly, prove a fascinating and absorbing hobby but if, as in my own case, success with the fish is offset by the usual difficulties encountered in flat-dwelling, then gradually the love of the fish becomes more of a task than a pleasure although one may still continue to dream of all the varied possibilities connected with the solvent of owning one's own house and garden. I suppose we have all had schemes of massive breeding ponds and rearing troughs and some, I know, have put these into operation but I wonder if they are wise or their plans even workable in our dismal climate.

Consequently, without the assistance of artificial heat for the first three months of the fishes' lives, Fancy Goldfish breeding in England would be a complete loss so that, quite apart from raising pools, etc., the possession of a sunroom heated aquaria housed in sheds or glasshouses is an absolute necessity. In the few cases I have seen where all-out efforts to breed fish have been made, the results failed to justify the effort involved whilst the appearance of the

garden is scarcely enhanced by rows of breeding troughs and other paraphernalia.

However, after 20 years of life in flats I, at long last, secured the desired house with garden and had the opportunity of deciding not only how to plant it but of clearing, first of all, an impenetrable mass of climbing roses and blackberries to say nothing of an enormous quantity of miscellaneous rubbish.

Knowing the natural fecundity of fish and the labour involved in the rearing of numerous spawnings, I had decided that the appearance of the garden must take first place, the requirements of the fish being allowed to fall more into the background than had hitherto been the case. "After all," I reasoned, "I have had the pleasure and good fortune to breed all the major varieties and should know by now that the perfect specimen is a very elusive creature."

Fortunately, long before I moved, I had not only reached a conclusion as to how I should behave in such circumstances but had even gone so far as to construct a scale model of the garden. Since I hope that some of the ideas



The neglected garden taken over by the author and which he transformed in a few weeks.

involved may be useful to others I will explain the approach made to the problem.

The garden was small—some 60 ft. by 21 ft.—and would therefore require the artificial and curbing of which I was capable if the effect I desired were to be obtained. The plan I had envisaged entailed the construction of two pools, one some three feet higher than the other, the two being connected by a series of waterfalls each of these terminating in shallow basins which would serve as bird-baths. The higher pond was to be surrounded by a rockery which would also extend along one flank of the larger, lower pool.

Now, to be of any use as regards fish, a pool must have a reasonable surface area and I had decided that the top pool should be some 4 ft. by 5 ft. whilst the lower one should average 4 ft. in width and extend some 12 or 13 ft. With the extra width of the surrounding rockery this would leave precious little space for the inclusion of a lawn area, since this was deemed a necessity, the plan had to be so arranged that one did not overshadow the other and that integrity was avoided.

The only path included in the plan was therefore thrown well to the left leaving just a narrow bed of some 12 to 15 inches between it and the party-fence. To give an illusion of greater length to the garden the lawn was shaped so that the widest possible area was sown nearest the house, this diminishing as it passed the pool and widening again on the far side to branch out into three divergent lines. The model was constructed of Plasticine on a piece of plywood cut to the shape of the garden and to a scale of 12 in. to the yard. Once this had been satisfactorily completed, it provided a three-dimensional scale for the project which allowed the constructional part of the work to proceed as the ground was cleared.

Such a plan as this, where the rockery was to extend some 30 ft. or more, and where large

masses of stone would be required to form the waterfall, was likely to prove expensive if natural stone such as Westmorland or Camberland were used and, moreover, would require more than the strength of one man to place in position. However, as the ground was cleared, it became evident that sufficient broken concrete, old bricks and pieces of paving-stone were present in the garden to form a basis for artificial stonework so that, as these were dug up, they were placed in suitable positions and such small confiners and plants as I had brought with me were planted amongst them.

The lower pond was excavated to a depth of 4 ft. 6 in. at one end tapering to 15 in. at the other and such ordinals as gas and water piping, wire netting, conge-iron, etc., which I found in profusion were laid in the bottom and, where possible, bent up the sides so that when embedded in the concrete they would form adequate reinforcement.

The top pond, which would rest on newly piled-up soil, would obviously require extra care as subsidence was almost a certainty as time passed and, whilst this would not matter if the whole sank intact, the possibility of fracture to the sides had to be prevented. Reinforcement to concrete is usually placed at the bottom if the load is to be applied above and near the surface if pressure is bearing upward, in order to guard against the complete absence of tensile strength in this material.

Method of Reinforcement

Here, however, the shape had to be taken into consideration for it roughly conformed to that of a bowl. The reinforcement used was in the form of chain-link fencing and was bent around the cavity so that the metal rods passed round the pond and also from the top to the bottom—moreover, two layers were used, one at the exterior face of the concrete and the other at the interior face. Should any subsidence now occur the wires that can happen is that one of the stones of the waterfall may be fractured, but this would be of little consequence.

When embarking upon a scheme of this nature it is advisable to make a reasonably accurate estimate of the material required for, once the concreting is commenced, the whole pond should be completed that same day as concrete does not knit together once a portion has "gone off". In this case two yards of ballast, one yard of sand and a ton of cement were used although some of the sand went towards the construction of artificial stones. The proportions used were 5:1 for the concrete and 3:1 for the sand and cement for rendering. Odd-shaped or informal ponds are undoubt-

edly the most pleasing to the eye but they can be far more difficult to construct than the formal or symmetrical type since some form of buttressing will usually be required around the base and, especially if this is surrounded by a steep rockery and this, owing to the irregular shape, can be difficult to build and strut.

With sufficient enthusiasm, however, these

obstacles can usually be overcome and, since the final rendering of sand and cement will require a key, the rougher the finish to the concrete the better. This rendering should be at least 1 in. thick and it is advisable to use a small amount of waterproofing cement with it as ordinary sand and cement is fairly porous.

(To be continued.)

From My Experience...

AMONG my favourite fish is the White Cloud Mountain Minnow and, according to an exchange of observations with overseas aquarists, it appears this species is also held in high esteem by fishkeepers in many countries. It was during an exchange of information that I received two near identical reports of White Clouds spawning in a distinctive way. During the spawning the male apparently wrapped its body around the female such as does the Siamese Fighter (*Betta*), as it happens.

His behaviour on the part of White Clouds both intrigued and surprised me, for I had closely observed many breedings of the species and, on every occasion, it had been a typical male's spawning, with the male driving the female around the tank, without any sign of actual contact. It was, in fact, two years after the reports had been received before I eventually succeeded in witnessing a spawning such as my correspondents described.

The fish concerned were the latest specimens I have acquired and, incidentally, the most brilliant in coloration that I have yet seen, the dorsal fin being marked with vivid red and a slight orange edge. The fish—two females and two males—had been placed in a well-planted tank under natural daylight conditions. The breeding method used was simply of keeping the fish well fed on livefood and watching for signs of fry amid the thick surface cover of plants.

Spawning Observed

One afternoon, whilst the sunlight was illuminating the tank, I chanced to notice two of the male White Clouds chasing a female who suddenly dived vertically head down into a mass of blanket weed. One of the males immediately wrapped her in a split second embrace before both fish parted and resumed

the chasing. This procedure, with both males taking part, was repeated at close intervals for several minutes.

Freshwater Pipe Fishes

In common with most aquarists I am always interested in any new species, and it was quite a day for me when I acquired two newly imported specimens of Freshwater Pipe Fish. In appearance these fish show an extremely elongated body, encased within a series of hard, bony plates. The head is mainly composed of a long tubular snout terminating in a tiny pair of jaws.

The overall length of my fish is 4½ in. Their coloring is rather drab, the dark brown of the back fading to lighter underparts. A black line extends from the tip of the snout, back across the eye, along the body to the tail fin base.

The unusual spade-shaped caudal fin is black with a white edge. Given a tank to themselves the Pipes settled down to an almost continuous leisurely search for food, not only among the surface plants, but also over the tank bottom.

I soon discovered that two types of livefood were relished equally, i.e., small *Daphnia* and *Mikro*-worms. It was interesting to note the difference in the jaw movements used by the Pipes when feeding on these two foods. The *Daphnia* were taken with a rapid snap of the tiny jaws but, to take the *Mikro*, as it lay on the bottom, the fish slowly puffed their jaws into a rounded funnel shape, whilst the cheeks and throat were very clearly distended, which action suggested that suction was being applied to draw the worms into the mouth.

My general observations of the Pipe Fishes showed them to be of a most peaceful and friendly nature—my hand in their tank was something to be examined from all angles!

R. W. ANDREWS

Photograph G. Kinnaird



PICK OF THE PETS

NO. 1. THE SALAMANDER

A New Series by Alfred Leicester, B.Sc., on *Rapists and Amphibians for the Beginner*

PETS which are long lived, hardy and resistant to illness, easy to feed and not too much trouble to keep, are far more rewarding to a beginner than the more showy and temperamental kind. There is plenty of time for these later on when one has gained more experience.

A hardy favourite which makes a good beginning to the vivarium hobby is the European Salamander (*Salamandra atra*), known for centuries as the legendary Fire Salamander. Records of the life span in captivity go up to 30 years, and the salamanders in my own collection are still going strong after 10 years. Frequent appearances at lectures, aquarists' shows and on T.V. have not disturbed their health and equanimity.

Normally docile and entirely harmless, this attractive, slow moving little creature seems ideally suited to life in the confined space of a vivarium. From personal experience I find that an aquarium, being watertight and easy to move about, makes just the right kind of container for salamanders.

To prepare this home, first line the floor of the aquarium with about two inches of well washed gravel or aquarium sand. Next, scoop out a hollow near the viewing side and line with large stones or rocks. Fill this with clean water to create a miniature pond.

Continue filling until the water saturates the surrounding sand to just below the surface. On this place a further layer of loamy soil, mixed with leaf mould, which will soon absorb moisture from the underlying sand, and provide an excellent medium in which to grow shade and moisture-loving plants, such as mosses and ferns. Other plants may be chosen from a transitory catalogue. The plants are set in the soil and anchored with stones.

In the spaces between are built hiding places

for the salamanders which prefer to retire during the daylight hours. These little retreats can be made out of pieces of curved bark, broken flower pots, and flat stones raised on supports. Bark and stone with moss already growing on them should be looked for in the countryside. For a while it may be necessary to top up the 'pond' until the water settles to a steady level.

A home like this can go on for years with little attention. To retain a humid atmosphere, to keep out dust and prevent the creatures from escaping, the tank should be covered with sheet glass raised on corner supports just clear of the top. Salamanders feed on almost anything small which moves, and will take Earthworms, slugs, beetles and caterpillars, also bits of raw meat served about close to their heads.

Breeding Possibilities

Frequently they breed in captivity. The male, in a clumsy courtship, attempts to clamber on to the female's back. He is recognized by the more swollen cloacal region at the base of the tail. The female has a brood of gilled babies laid in water. To produce her family, often quite a large one of 20 or more, she takes a kind of hip bath in shallow water.

The gilled babies, not unlike larval newts, should be removed and reared separately in shallow, well matured water, on *Infusoria* and *Daphnia*, or gnat larvae. They transform into baby salamanders in about 10 weeks and feed on minute insects, tiny Earthworms and slugs, to which can be added the well-known *Echyron*, or White Worm.

A tastefully planted tank of green plants displaying brightly coloured yellow and black inmates in pleasing contrast can make a very attractive ornament in a shaded drawing room.

REPORT FROM RUMANIA



A visit to the only tropical fish shop in Bucharest

by JON MILLER

RECENTLY returned from Rumania, where I made a tour of some fishing research stations. Although there is no large-scale fishkeeping hobby there, I did manage to nose out some information on the subject.

My journey took me from Bucharest to the Black Sea port of Constanta. There I visited two research stations, both of which had small aquariums containing Black Sea specimens. They included the Sturgeons *Acipenser stellatus* and *A. gulosus* (from which the best caviare is obtained), and some Mullet which are a great specialty of the region. From Constanta I went north to the town of Tulcea, in the Danube Delta, visiting many fishing stations on the river.

In the Capital

It was only in Bucharest that I found any signs of the fishkeeping hobby. In Macei Millo stands the only tropical fish shop in the city, and probably the only one in the country. It is privately owned and run by Iosif (professional Joseph) Petrusca. He started the business in 1926 and has run it ever since. He told me that there had been several other attempts to open similar shops in Bucharest but, he chuckled, they had all gone broke.

Iosif has always been keen about fishkeeping. I was used to get into trouble at school, because all I wanted to do was to keep fish. The first time, I was right! I was born in Rumania of Czech and Hungarian parents. His brood all his own fish and, for the past 14 years, has only had to add new blood occasion-

ally—to prevent degeneration—and such fishes have been obtained from Prague and Vienna.

This Summer he bred 6,000 fish of 26 different species. His fish do not include anything unobtainable in England. All the time he talked to me—with great excitement—he was kept very busy serving a stream of customers.

I asked him what the most popular sort of fish were. "Oh, red ones, anything red. Also anything with large tails," was the technical answer I received. The red, he assured me, had nothing to do with politics.

As I left this busy little island of private enterprise, Iosif begged me to send him some English books and magazines on fish and aquariums. He had not seen any since the war. I promised to send him a selection including, possibly, a copy of *FISHKEEPING AND WATER LIFE* with his picture in it.

Jon Miller photographs of Mr. I. Petrusca's shop in Bucharest. Above, exterior, and below, Mr. Petrusca standing beside some of the aquaria.



WATER WISTARIA

A recent introduction rapidly becoming popular for tank decoration

by GERHARD W. E. BRÜNNER (HAMBURG)

DURING recent years importations have resulted in various new plants becoming available to aquarists. Water Wistaria, introduced in 1954, is doubtless the most important of these. Due to its beautiful appearance, simple cultivation and multiplication by vegetative means, this plant has found many friends among aquarists and today it is one of our favourite aquarium plants.

It was impossible to give a true identification of the submerged plant immediately it became available but, because of its Wistaria-like leaves, it was called Water Wistaria. After flowering from arial plants was accomplished, the Royal Botanic Gardens, Kew, gave this plant the name *Synsena triflorus*. This determination was acknowledged later by Professor C. E. B. Bramkamp (Utrecht) and Dr. H. Heine (Munich). Like *Hypophylla*, *Synsena* is a member of the *Acanthaceae* Family and it is distributed over wide areas in the wetter tropics of Asia.

Adaptable Plant

It grows as an amphibious plant and is adaptable to the change of water level ranging from flooding to near complete dryness in its habitat. Hooker says of its localities: "On the margin of water, Bengal, very common, Assam, Pegu and Singapore". Mr. R. Schmidt, Frankfurt, who introduced this plant to Germany, found it about 130 miles north of Bangkok in Siam, in a ditch growing with other water plants.

Submerged and emerged leaves are very different in size and shape. While the smaller leaves of young submerged plants are only slightly feathery shaped (pinnae), or not at all, those of more mature stems are longer and deeply divided into numerous segments; they are pinnae or comb-like (pectinate), and the plant then appears like a Water Fern.

The submerged leaves are up to 5 in. long, opposite, bright green on the upper side and somewhat whitish beneath. Vertical stems are up to 15 in. long. At a length of eight to 10 in. the plant has ascending runner-like shoots



An arial shoot of Water Wistaria with flower buds (quite insignificant) formed in the leaf axils.

which tend to grow lying on the bottom before rising at the end.

The leaves of plants above the water surface are oval (elliptical) or oblong-elliptical, wedge shaped (cuneate) to the base, mostly without stalks (sessile) to the base, mostly without edges (crenate serrate). Emerged plants grow more or less lying on the ground but tend to ascend at the end. They have glandular hairs (pubescence) all over. If touched, a musk-like odour is emitted.

Flowers arise, one two or three together, mostly opposite, from the leaf-axils. They each have two bractlets, are double-lipped and



a pale violet shade. The 1 in. long corolla is divided into an upper-lip and a three-lobed under-lip. One of the five acute sepals is somewhat longer than the others. The palae has deep violet spots, is transversely wrinkled (longitudinally) and hairy. Each flower possesses four stamens, two as long as the upper-lip, the others posterior and hardly smaller. The pubescent style juts into the curved incision of the upper-lip. Capsules are narrow, 1-1/2 in. long, with numerous minute seeds.

The cultivation of Water Wistaria is not difficult, because it is adaptable to various conditions. In sand or sand-loam covered with a layer of sand or gravel, soft water (pH slightly acid) and a temperature ranging from 77 to 85 deg. F., the plant will develop handsome branches.

With strong or moderate daylight or fluorescent lamp illumination large leaves with numerous segments are produced which give a beautiful contrast to the darkish green foliage of *Cryptocorynes*. The nodes of the stalks develop adventitious roots rapidly; therefore propagation by cuttings pegged down in the bottom-land is very easy.

The rooted shoots can be nipped off from the water stems. According to van Ransalst and A. Wendt single leaves float freely on the water surface and, after a time, produce roots and shoots. Further, it is possible to propagate from home-produced seed. Extreme changes of temperature are to be avoided as they cause mostly undivided, rather less decorative leaves to be produced and growth generally is interrupted.

The English botanist, W. Roxburgh (1759-1813) named this plant *Ruellia triflora* Roxb. (1814), but his description was published late in 1832. It cannot claim priority because a short time before (only a few months) the description of Nees (1776-1858), who named the plant *Adenocoma triflora* Nees, was pub-

(Photographs and sketch by Gerhard W. E. Brünnner)

Left: The submerged leaves of Water Wistaria. Here the much segmented leaves form a rosette which is common in aquarium specimens and increases decorative effect.



A front view (enlarged) of the double-lipped Water Wistaria flower with the stamens and style projecting. The flower is a light mauve colour.

lished. These dates were communicated by Kew. During a later revision the Genus *Adenocoma* was transferred into *Cordia* Buch-Ham, which gave the plant the name *Cordia triflora* Buch-Ham et Nees.

Finally, after our investigations, the German botanist, Otto Kuntze (1843-1907) named this plant *Synsena triflorus* (Roxb.) O. Kuntze, because the Genus *Synsena* Bentham had priority over *Cordia* Buch-Ham. Due to these facts it is preferable to cite Nees, the earlier author, according to Kew. Therefore the valid name is *Synsena triflorus* (Nees) O. Kuntze.

By translating the scientific name (syn- incorporate, nema - thread, triflora - three-

flowering) we hardly can get a suitable popular title. It will be difficult to replace Water Wistaria and to find a new name. Wistaria actually has no relation to a member of *Acanthaceae*.

Summarising, we can say, this plant is an ideal aquarium plant. Its beautiful foliage, rapid growth and easy multiplication will hardly be surpassed by any other water plant. I should like to express my thanks to the Director of the Royal Botanic Gardens, Kew, for certain information.

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Water Wistaria leaves showing the variation that can occur. An arial leaf is on the extreme left, whilst the other drawings are of submerged leaves.

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by DR. P. N. GHADIALLY

TRANSPORTATION of a few or many fishes over short or long distances during the Winter months is a problem that requires serious thought. As a fair number of aquarists call at my home, I have had a good opportunity to study the different ways in which we carry about our fishes.

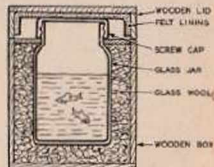
Perhaps the most popular container for transporting just one or two fish is the jar with its mouth covered by a piece of polythene held in place by a strong rubber band. This is quite adequate for very short journeys, even on the coldest days, particularly if the jar is placed in the breast pocket and kept warm.

For carrying a larger number of fish all sorts and sizes of glass jars are employed. On cold days a serious drop in temperature can occur in such uninsulated containers. It is therefore useful to start off with water much hotter than required. The fishes are placed in the glass jar with aquarium water at the usual temperature (75 to 78 deg. F.). Boiling water is then added

carefully in small amounts (seeing that none reaches the fish directly) over a period of 5 to 10 minutes till the temperature is raised to about 83 to 85 deg. F.

The fish are then ready for transport. Even a 15 deg. drop in temperature during transit would now leave the fish in water at 70 deg. F., which is quite comfortable for most tropicals, while a 15 deg. drop, say, from water at 75 deg. F., would bring the temperature down to 60 deg. F., a level which can prove risky if prolonged for a fair length of time.

Steps should also be taken to reduce the heat loss by wrapping the glass jar in many layers of



The fish carrier suggested by Dr. Ghadially.

newspaper or in a towel or blanket, if available. I have found such methods useful in emergencies when no better method of transporting fishes is available. But undoubtedly one of the best ways of transporting fishes, particularly over long distances in cold weather, is in insulated containers.

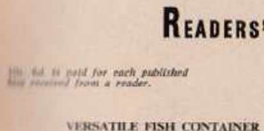
Many and varied are the designs that have

been evolved by aquarists. Essentially they comprise of a jar or jars housed in a small wooden box, either made especially for the purpose or picked up at an ex-starry store. The jar should be of such a size that it fits loosely in the box. The space between the jar and the inside of the box is filled or lined with some insulating material.

The diagram shows a container of this type where glass wool has been used as an insulating material. Such containers are, no doubt, efficient for the job, but unfortunately they tend to be rather heavy and clumsy. It is for this reason that I have not employed them to any great extent.

The most efficient, though rather expensive, container for carrying fishes is the wide-mouthed Thermos flask. There is no risk of any substantial temperature drop, spilling or breaking when handled with care and common sense. Insulated fish carriers with rubber net bags, which can be obtained for only a few shillings, make containers for an odd fish or two.

Whatever type of carrier is employed, there are certain general principles which must be observed. Make certain that the container is slightly hotter and certainly not cooler than the water in which you are going to carry the fish, or else it will take away heat from the water later on and add to the cooling process which we are trying to retard.



Making a fish container of varying depth by using a sheet of polythene overhanging the edges.

This is very simply achieved in the case of ordinary glass jars by rinsing with hot water or aquarium water but, in the case of insulated containers, it is best to fill up the containers with moderately hot water for some period (an hour or two) prior to use, so as to allow it to warm up thoroughly.

The next important consideration is gaseous exchange. We are often forced to carry more fishes than a given quantity of water will support for any length of time or else we would have to use very large containers indeed. That being so, we must provide as big an air surface as we possibly can. This means that (a) we must never fill up the entire jar with water but should allow a substantial air space. (b) If the jar narrows at the top, it is better to keep the water level low so as to get the maximum water surface possible. (c) If we are certain that the lid fits well and does not leak, maximum water surface can often be achieved by laying the jar on its side.

One factor which contributes considerably towards the survival of fish crowded in a small container is the continuous movement of the water during the journey. This helps to 'aerate' the water. If the same jar is left standing on a table, fish would show signs of asphyxiation very quickly indeed. The little bumps during the journey are, up to a point, beneficial and not harmful.

A big advantage is that the water depth can be adjusted from beneath and the container kept filled to the top. Polythene sheeting can also be employed in a tank that leaks. It is not expensive and will last one or two years if not punctured by carelessness. —(P. F. EWEENE, Salisbury, Wilts.)



Peter and B. J. Upchurch outside the new fishhouse in the garden of their Hitchin home.

Winning Ways with Fancy Goldfish

B. J. and P. Upchurch (Hitchin, Herts.) continue their successful fish breeding technique

"A.H." said the railway official, at Hitchin, Herts. station, "he's the aquarium fellow", as I enquired the way to B. J. Upchurch's home. Such is a mark of fame in our hobby. For fame it is with Mr. Upchurch; in the post-war years when he exhibited Goldfish he left his impression on practically every large aquarium show. Highlights, perhaps, were first and second in the 5 in. limit class for Bristol Shubunkins at Bristol in 1949. Not content with that he took first in the Veiltail class at the same Bristol A.S. show and four trophies including the one for best fancy fish. All these distinctions came in classes of 45 and 39 entries.

Random selection of other exhibition successes show him as exhibitor of the best fancy Goldfish (Strachan Kerr Trophy) at the three successive National Aquarists Society's shows (1949, 1950 and 1951) and first, second and third with Bristol Shus at the 1950 N.A.S. event.

Mr. Upchurch began his fishkeeping in 1932 with Common Goldfish, got a little impatient waiting for the fishes to change colour despite experiments, and in 1938 turned his attention to Shubunkins. He held his strain of fishes during the war and took his first prizes in 1946, the same year that he started with Veiltails. Then began the chapter of astonishing show successes.

Apart from strict line-breeding Mr. Upchurch believes one of the secrets of showing Goldfish is to train the exhibitor for the occasion, taking them from their ponds or aquaria and, over a period of perhaps four weeks, getting them acclimatised to the size of tank they will have at the exhibition. "He experiences no trouble with water variations as he has a continuous water change system in his fishhouses."

When he began in the hobby his fish

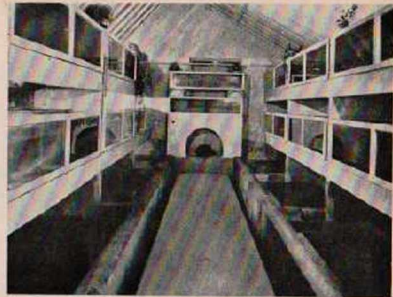
accommodation consisted of two greenhouses but wide fluctuations in temperature soon decided him to build a fishhouse in its own right. This substantial structure is 17 ft. x 10 ft. and contains 20 aquaria in three tiers with six ponds at ground level to receive fish after culling.

In 1954 it was decided to expand still further and, with very little outside help, Mr. Upchurch and his son Peter set about the task of constructing a large model fishhouse with every facility for Goldfish breeding. It is brick built with a double apex roof, one side of which is double-glazed, the other insulated. A coke boiler keeps the temperature just above freezing point in the winter for Mr. Upchurch does not believe in coddling Goldfish.

A water flow system in both fishhouses supplies the top aquaria with a drip of water which overflows into the second tier and finally into the ponds beneath to run into gutters that go to an underground soak-away. In this fashion clear water, which he regards as an absolute essential, is maintained. The new fishhouse contains 37 tanks of 48 x 24 x 15 in. aquaria with nine ponds each 8 ft. x 3 ft. 6 in. x 15 in. beneath.

Since this fishhouse was built a streamlined breeding pattern has been formulated. Three tanks in an upper corner top tier are prepared for each spawning. One is set with willow moss. The spawning female is then put in this planted aquarium and the first parent male introduced. After some eggs have been laid the willow moss containing them is taken out and put in one of the remaining two aquaria. The male is also removed and another put in. He is taken out after more eggs have been laid on willow moss and the eggs put into the

The efficient cold-water fishhouse built by B. J. and P. Upchurch in their garden. It has two tiers of orthodox aquaria and ponds at ground level.



third tank. The third male is then introduced when the spawning is completed and both parent fishes are taken out.

In this way the progeny for future line breeding is available and the potentialities of different males can be judged. More and more tanks around the fishhouse are taken up as periodic sorting is done.

When sufficient spawnings for the available accommodation have been taken all the parent fishes are released into garden pools when they spawn at liberty and, of course, any youngsters that should grow on are of no interest. There are three large ponds in the garden and another in the course of construction. Outside conditions plus good feeding

provide the right conditions for the developing young once they are beyond the baby stage, although all double-tailed varieties are taken into the fishhouse for wintering.

Feeding consists of Rotifers in pond water for the youngsters' first food once they are free swimming and all others receive ample quantities of Daphnia, Glass-worms, garden worms and wheat-germ dried food, plus a mixture of Mr. Upchurch's own making.

Mr. Upchurch's show appearances came to an abrupt end in the summer of 1951 when illness made him cut down drastically on outside engagements. If it had not been for the enthusiasm of his son, Peter, recently returned from the Services, there is little doubt that his



Some of the young Veiltail Goldfish bred by B. J. and Peter Upchurch. These are Collier fish and show good development in juvenile stages of this type.

production of Goldfish would have been very much reduced.

But Peter was at hand and he was successful in the two exhibitions he entered; that for the Pencil Trophy arranged by the Goldfish Society in late 1952, when Bristol Shubunkins were the fish selected, where he took the trophy and first three places and also at the N.A.S. event of 1954 when first and second in the Bristol Shubunkin class went to him. There has been no more exhibition work since then but from my visit I would say there will be some leading prizewinners from this breeding establishment in the not too distant future.

When Mr. J. Hereman imported Bubble-eyes, Pearl Scales, Gramlins and Lionheads from the Far East in 1951, Mr. Upchurch bred from them and is now developing strains of these fishes. After two infertile spawnings from the Orandas 1,700 youngsters were reared, 70 per cent with divided tail fins and twin-oculars. Mr. Upchurch does not share the view that Twintail Goldfish are more difficult to spawn than Singletails. Certainly they require much more tank space but that is all.

The initial spawnings from the Lionheads were not quite so successful but I saw some lovely youngsters growing into what could prove the foundation of a very good English-bred strain.

Pearl Scales produce fishes with a wide variety of finnage although the scale character has been well maintained, whilst the home-bred Bubble-eyes are making good progress with strong eye-bladder development. Serious breeding is now concentrated on the original strains of Shubunkins and Veiltails plus development of Bubble-eyes, Lionheads and Pearl Scales.

Looking back on two and a half decades in the coldwater fish hobby Mr. Upchurch remembers, with especial affection, his early experience with Shubunkins. After two years breeding he began to get some colorful fish. Then, to quote his own phrase, "I hit the jackpot. By accident I was faced to mate a plain pinky-white male Shubunkin with long flowing finnage to a female coloured red and brown, and splashed with black spots. The colours of the youngsters were brilliant orange, mauve and blue, splashed with black."

That year he regarded as his best breeding season. In two subsequent seasons the parent fishes failed to produce comparable youngsters but then the offspring were mated back to their parents with excellent results. The basis of a Shubunkin strain was made.

Final words of advice from Mr. Upchurch were, "There are no short cuts to producing winners among cultivated fishes; buy the best fish you can afford but then be prepared for serious work."—L. W. ASDOWS.

Fish Philately



Lionfish

IN 1951, the Portuguese colony of Mozambique, in East Africa, issued a beautiful series of stamps devoted to the fish found in the colony's coastal waters. This 20-centavo stamp, printed in pale olive-green with red lettering, depicts the remarkable Lionfish, or Winged Fire Fish (*Pterois volitans*) in its natural zebra coloration with bright red pectorals.

The Genus *Pterois*, found in the Indian Ocean and Pacific, belongs to the large Family Scorpaenidae, a branch of the Sub-order of bony-headed Mailed-check Fishes. Species in the Genus are remarkable for their large pectoral fins, elongated dorsal spines and zebra-stripe markings.

The Lionfish is handsomely coloured, but fishermen greatly fear its needle-like spines which, as in so many others in the Family, are equipped with poison-secreting glands. Sometimes reaching a foot in length, this fish spends most of its time lurking in crevices in coral reefs, awaiting the prey on which it will pounce at lightning speed.

The Lionfish has been shown and described in detail on several occasions recently on B.B.C. television, notably in Dr. Hans Hass's fascinating underwater film of marine life in the Red Sea, and in a programme from Manchester's Belle Vue Zoo.

JOHN WAKEFIELD

FISH ENEMIES

Great Diving Beetle

by JOHN CLEGG, F.R.M.S.

Illustrations by the author



IT is most unlikely that an aquarist or pond-keeper would consciously introduce into his tanks or garden pool any creatures that were detrimental to his stock, but it is an undoubted fact that many pests do gain admittance in one way or another. In this series of articles I shall be describing and illustrating some of the more insidious ones and since in this field, as in any other, prevention is better than cure, I will try to show how such creatures unwittingly become introduced and, where possible, mention measures that can be taken to avoid them.

Undoubtedly the most troublesome pest in garden pools is the Great Diving Beetle (*Dytiscus marginalis*) illustrated here. It is one of our largest native beetles, with a body about 1 1/2 in. long, greenish-brown in colour and with yellow margin round the wing-cases and legs. It has an appetite in keeping with its size and its powerful jaws, and will attack any living thing in the water. Serious damage even

to large fish can result as well as considerable havoc among fry.

The cause of the damage may not, at first be apparent, and it is only when the surface of a pond is watched carefully for a considerable time that the beetles will be seen making brief visits from the lower regions to obtain the atmosphere as they need for breathing. Who always puzzles the novice is how the beetle becomes introduced, even into a newly-made pond. This is simply explained; the beetle are good fliers and can make quite long flights usually at night, from pond to pond. (One must indeed these nocturnal journeys are the undoing of the creatures for they frequently mistake a wet road or even the reflections in the glass of a greenhouse for water and land with stunning impact.)

There is no other way of controlling the adult beetle than catching them either with a net or by dangling worms or small pieces of meat on the end of a string in the areas where they have been observed. Once they have attacked the bait, they will hold on firmly with their legs and are landed.

Ease of Introduction

The larva, or early stages, are as voracious as the adults. They can easily be introduced particularly when small, either into aquarium or pond, among new plants, and the old advice, often ignored, of quarantining new plants for a few hours in a dilute solution of potassium permanganate, together with careful examination of the plants in a white dish, are the only effective safeguards.

The eggs of *Dytiscus* are laid in early Spring in slits made by the female in the stems of water plants and, if new plants are being introduced about April, great care should be taken to watch for any young larvae which may have emerged.



International Guppy Exhibition in Germany

The British Guppy Federation set a record number of 14 teams (each of three animals) displayed in the International Guppy Exhibition originally planned to last four days at the Berlin Zoo, but extended to five days on September 1-5. Entries were received from Canada, Australia, U.S.A., West Germany, the German Democratic Republic, Denmark and England.

Star Collectibles

Fishes from the British Federation were used in the exhibition. The British Federation is the largest guppy organization in the world. The exhibition was held from 10:30 a.m. to 6:00 p.m. daily. The exhibition was held at the Berlin Zoo. The exhibition was held at the Berlin Zoo.

Full Participation at British Guppy Show

ALTOGETHER, 16 representative exhibitors of Guppy Clubs from 15 different sections of the Federation of Guppy Clubs in Great Britain participated in the British Guppy Show which was held at the Alexandra Palace, London, on September 1-5. The show was held at the Alexandra Palace, London, on September 1-5. The show was held at the Alexandra Palace, London, on September 1-5.

Highest Points for E. Coates

Entries from E. Coates, the highest points scorer in the show, were 25 points gained by Mr. R. Evans. The show was held at the Alexandra Palace, London, on September 1-5. The show was held at the Alexandra Palace, London, on September 1-5.

Wilkesden's Entry Substantially Increased

DESPITE a drought, the Wilkesden Show at the Alexandra Palace, London, on September 1-5, was a great success with an attendance of nearly 25,000. The show was held at the Alexandra Palace, London, on September 1-5. The show was held at the Alexandra Palace, London, on September 1-5.

First Goldfish Convention

AN ASSOCIATION of British Goldfish breeders met at the Alexandra Palace, London, on September 1-5. The convention was held at the Alexandra Palace, London, on September 1-5. The convention was held at the Alexandra Palace, London, on September 1-5.

Hydrogobal Decision

The Hydrogobal Society, a new society for the study of hydrogobal fishes, was formed at the Alexandra Palace, London, on September 1-5. The society was formed at the Alexandra Palace, London, on September 1-5.

Keeping Reptiles and Amphibians

Reptiles and amphibians were the subject of a lecture given by Mr. G. F. Boys, Secretary of the British Herpetological Society, at the Alexandra Palace, London, on September 1-5. The lecture was given at the Alexandra Palace, London, on September 1-5.

North London Congress

A North London Congress of the British Herpetological Society was held at the Alexandra Palace, London, on September 1-5. The congress was held at the Alexandra Palace, London, on September 1-5.



Meeting in the celebration of the 21st anniversary of the British Herpetological Society, held at the Alexandra Palace, London, on September 1-5. The meeting was held at the Alexandra Palace, London, on September 1-5.

All Tropicals for Bethnal Green

WHY the exhibitor entries were made for the annual Bethnal Green Show at the Alexandra Palace, London, on September 1-5, was the subject of a meeting held at the Alexandra Palace, London, on September 1-5. The meeting was held at the Alexandra Palace, London, on September 1-5.

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Mr. J. G. Phillips was the main speaker at the meeting. He spoke of the importance of the show and the need for more tropical exhibits. The meeting was held at the Alexandra Palace, London, on September 1-5.

Highly Commended

Mr. J. G. Phillips was highly commended for his entry in the show. He received a prize for his entry. The show was held at the Alexandra Palace, London, on September 1-5.

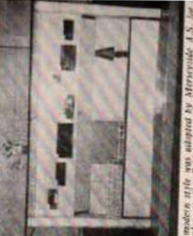


A photograph of the 21st anniversary year of the British Herpetological Society, held at the Alexandra Palace, London, on September 1-5. The photograph shows a large, ornate structure with the word 'MAGNUM' on it.

Festival at Manchester

VISITORS from all parts of the world at the Manchester Festival at the Alexandra Palace, London, on September 1-5. The festival was held at the Alexandra Palace, London, on September 1-5.

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A photograph of the 21st anniversary year of the British Herpetological Society, held at the Alexandra Palace, London, on September 1-5. The photograph shows a large, ornate structure with the word 'MAGNUM' on it.



Club Notes logo featuring a stylized fish and the text 'CLUB NOTES'.

Rare Fishes

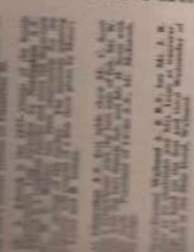
A rare fish was exhibited at the show. It was a highly prized specimen. The show was held at the Alexandra Palace, London, on September 1-5.

New Edition of "Livelihoods"

A new edition of the book "Livelihoods" has been published. It covers the latest developments in the field. The book was published by the British Herpetological Society.

National Exhibition

The National Exhibition of the British Herpetological Society was held at the Alexandra Palace, London, on September 1-5. The exhibition was held at the Alexandra Palace, London, on September 1-5.



A photograph of a group of people gathered around a table, possibly at a meeting or exhibition, with various items on display.

Mr. J. E. Edwards of Sussex, was made the 1st vice president of the British Herpetological Society, A.S., after his first visit to the Society in 1931.

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BOOKS

Guide to Tropical Fishkeeping (J. H. P. Brymer)	36/6
Handbook of Tropical Aquarium Fishes	75/-
Diseases of Fishes (W. T. Innes)	15/4
Exotic Aquarium Fishes (W. T. Innes)	65/-

All Books post free

GIVE YOUR AQUARIUM A NEW LOOK
Trouble Free and Easy to Fix PAPER AQUARIUM BACKINGS

24in. long x 20in. high Natural Stone sheet 1/6
Pebble Beach Effect sheet 2/6
Back sold at 1/3 per foot

LIVE FOODS

Brine Shrimp Eggs	2/6 and 4/6
Cultures of White Worm	} 2/6
Macro Worm	
Tubifex Worms	1/3 and 2/6

post free

PLANTS

Vallisneria spir	..
Vallisneria torta	..
Elovia densa	..
Hydrophila	..
Bacopa	..
Sagittaria natans	..
Sagittaria micro	..
Ambulia	..
Ludwigia	..
Indian Fern (Broad)	..
Hair Grass	..
Amazon Chain Sword	..
Water Clover	..
Crypto Beckettii	..
.. Nevilli	..
.. Willisi	2/6 and
.. Cordata	2/6 and
.. Hartilliana	..
..	2/6 and

Nymphae Stellata (Dwarf Lily)	..
Water Wistaria	..
Giant Hygrophila	..

REMEDIES

Queensborough White Spot Cure	..
Vivo Salts	..
Sea Salt	..
ClaroX (Not by post)	..
Liquitox	..
Diseasolve	..
Brosiam Fertilizing Tablets	..

FULLY-GLAZED AQUARIUMS PRESSED STEEL

Inches Tank H/d	Alum.
12 x 6 x 6	12/-
14 x 8 x 8	14/-
16 x 8 x 8	17/-
18 x 10 x 10	22/- 15/-

ANGLE IRON

Inches	
24 x 12 x 12	50/- 21/-
24 x 12 x 15	56/- 21/-
30 x 12 x 12	70/- 35/-
36 x 12 x 15	80/- 37/-
38 x 12 x 15	90/- 37/-

Carriage extra

Any shape or made to specific installations a speciality. Please add 1/- extra on appliance order to 10/-; 1/6 up to 2/-; up to 30/-; China and Shells at purchaser's own risk.

QUEENSBOROUGH FISHERIE

11 SHAW ROAD, QUEENSBOROUGH HOUSE, 11 PICTON PLACE.