

The Aquarist

and Pondkeeper

MARCH 1966

THE GARDEN POOL (1) *Special Coloured Supplement included in this issue dealing with Construction, Maintenance and Planting*



On the higher levels of this colourful pond surround are red saxifrage and sedums. Below the rocks step and in the muddier region of the pond's edge are seen drumhead primula, trillium and double marsh marigold. Floating leaves and white flowers of the water lily (Najas) pattern the water surface.

MONTHLY
Vol. XXX No. 12

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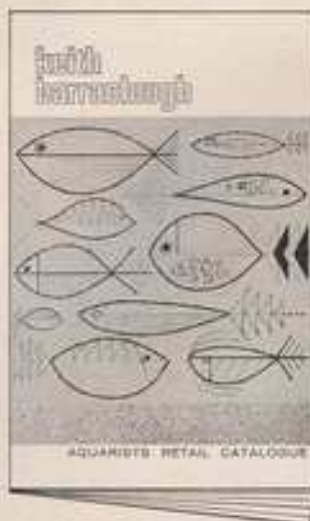
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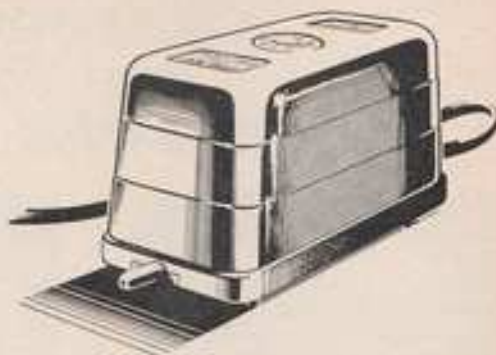
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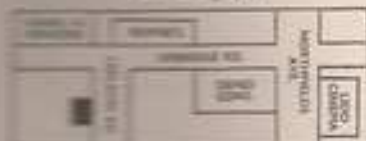
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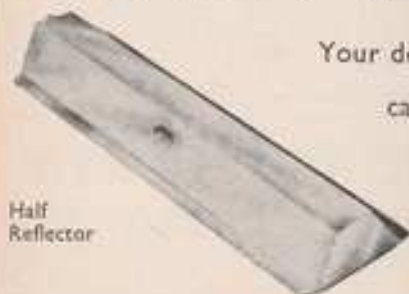
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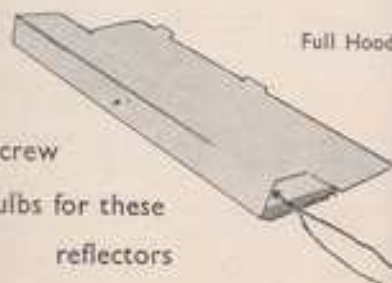
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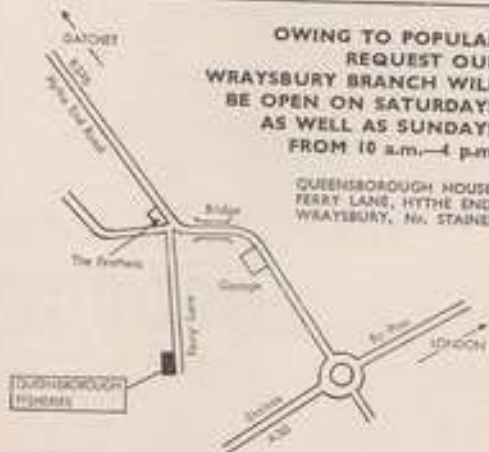
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See Page xi



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The Sucking Loach

Gyrinocheilus Aymonieri
(Tirant 1833)

by STEPHEN F. LANGTON

THIS useful algae-feeder seems to have become very popular over the last five years after a slow start during the previous five since its introduction into Europe. As far as I am concerned however, it has revolutionized the aquarium. It is by far the most efficient algae-stripper I have yet seen, outdistancing *Otocinclus* in the catholicity of its taste for algae, and being of a size more convenient for the majesty of smaller aquaria than *Plecostomus*, which is good enough when young but doesn't seem to stay young for nearly long enough. To see *Gyrinocheilus* introduced into an aquarium where the plants are heavily coated with algae, and to watch it twist agilely up the plant-stems, its flexible sucker-mouth almost enveloping them, is to observe the nearest thing to an ichthyological vacuum-cleaner yet evolved.

The species *aymonieri* was first put by its author, Tirant in 1883, into the genus *Psilichthys* to which it is not related, but his rather poor description of it effectively prevented anybody from guessing the truth until 1935 when Hora, an Indian worker (in honour of whose contribution to Ichthyology the curious and enigmatic tooth-carp relative *Herichthys* was named) realised that it was really a *Gyrinocheilus*. The genus had been set up meanwhile by Vaillant in 1902 for another species, *parvulus*, from Borneo. I can find no record of *G. parvulus* ever having been imported into Europe; it would be interesting to see whether it is as good a performer as its relative. The genus itself has been the subject of controversy in regard to its position. Vaillant put it in the *Homalopterinae*, a subfamily of the family *Cyprinidae* while other workers gave it subfamily status in its own right, all agreeing that it should be put in the family *Cyprinidae*, however. Then Hora gave it family status as the *Gyrinocheilidae* and there it remains so far, still allied to the Cyprinids.

What makes *G. aymonieri* so interesting to the scientist, so unique amongst fishes and so useful to the aquarist, is its quite peculiar mechanism of respiration which has been so modified that the fish can use its mouth to eat without having to use it to breathe. Any other normally-equipped fish must stop eating when it breathes to allow the water current to pass into the mouth, over the gills and out

through the opercular openings. *Gyrinocheilus* however, probably because it has adapted to meet the needs of its native environment in the swift hill-streams of Thailand, can take in air independently of the mouth through a small opening just above the normal gill-slit and can circulate it around the gill-chamber and pass it in the normal way out through the usual gill-slit. All ability to use the mouth in the normal way for taking in water seems to have been lost. This enables it also to cling on all the more firmly to stones on the stream-bed using the sucker-like mouth and lips without disturbing the hold on the substrate and breathing quite efficiently all the while. Other fishes of the hill-streams which have developed sucker-mouths for the same environment have not gone to the lengths to which *Gyrinocheilus* has, still taking water in through the corners of the mouth. As the inhaled opening is quite small (usually little bigger than the eye) *Gyrinocheilus* must breathe very rapidly to pull in a sufficient quantity of water to serve its oxygen needs. In fact, observations on a specimen of about 4½" (a good deal larger than the size to which they usually grow in the aquarium) showed its respiratory movements were made 230 times a minute when the fish was at rest. At intervals it can be seen that the fish completely stops all respiratory movements for as much as 10 seconds together; possibly the rapidity of breathing makes it difficult for the fish to control the amount of oxygen entering the blood and it in consequence becomes hyper-ventilated and must stop breathing for a while or perhaps there is another reason that I have overlooked.

The fish is a vegetarian but has no teeth either in the jaws or in the pharyngeal region. Instead its protrusible lips are folded, inside, into rasp-like projections with which it scrapes algae from stones and plants. Examination of a specimen *post-mortem* will show that its very long coiled intestine is crammed full with greenstuff, all algal matter which it has rasped from the plants in the aquarium—a fact which should please anybody whose main aquarium trouble is proliferation of a very persistent algal growth in the tank as there was in mine until the advent of the first *Gyrinocheilus* in the area.

This fish, like most of the hill-stream dwellers, has a poor development of swim-bladder when compared with the related Cyprinids and can only keep itself off the bottom of

the tank by swimming vigorously. This is the reason for the rather short sharp dashes which it seems to make most of the time. Its favourite resting-place in my tanks tends to be halfway up the side of one wall, adhering by its mouth closely to the glass from which position it can drop down and, turning height into speed, zoom upwards again to perform its cleaning activities on yet another plant standing in sore need of them. Sometimes a little group will gather in a corner, resting the forward part of their bodies on convenient pebbles, their pectoral fins and heads projecting over the edge of the stone. This position seems easiest for them to breathe in. Too many of these fishes in one tank leads to bullying as this species seems to be quite pugnacious towards members of its own kind but peacefully tolerates other members of the community tank.

Gyrinocheilus has a body-shape rather like that of other hill-stream dwellers (e.g. *Garra*), very stream-lined and flattened ventrally. It has no barbels. Colour can be quite variable but usually the back is brownish-yellow and the sides and ventral surface a lighter creamy-yellow. There is a blackish-brown band running the length of the body and passing through the eye; from this band extend upwards and downwards, about a dozen short bars. Larger specimens (above 3" in length) may have the band broken up into a dozen large dark blotches, the tail showing a series of dark spots across it. Each scale may also, at about this size, show a clear-cut brown spot. This fish generally tends to get darker as it ages. Aquarium specimens, in my experience, do not grow to more than about 3½" whereas in the wild reports tell of monsters of 11½" the usual wild size being nearer to 8" however.

My fish show no disposition to breed in their present surroundings and I am, at the moment, experimenting with differing environments and different pairs of fish to see if breeding can be encouraged. It may be that very well-aerated, clear water is necessary in order to simulate as far as possible the fishes' normal habitat.

I cannot remember reading in any Aquarist literature of any attempts at breeding *Gyrinocheilus*. But perhaps I have overlooked an account somewhere. For my part, however, even if I never succeed in breeding it, I shall always be thankful that a far-sighted dealer saw fit to import *Gyrinocheilus* along with their great appetites for algae.

Cryptocoryne Willissii

by B. FRY

WHY this plant should have all but vanished from the market is something of a mystery for it is, without question, one of the most easily cultivated, lasting, and aesthetically pleasing members of its fairly extensive genus to introduce into a tropical tank.

Its decorative value lies in its narrowly lanceolate leaves that are wavy along the edges and coloured pale green to greenish brown above, and deep purple on the undersides. Grown in clean, soft water with a slightly acid reaction, the leaves are about half as long as the stems, and combined will attain a height of from 7 in. to 9 in.

Like all *Cryptocorynes*, *C. willissii* prefers a rather mellow light and is therefore ideally suited to a position on the shady side of rockwork, or under a light-filtering

canopy of surface vegetation. It is not faddy about its rooting medium but flourishes best in a non-alkaline, gritty compost enriched with a trifling quantity of yellow clay or non-fibrous loam. A point to observe when planting this species is to see that the portion of the rhizome from which growth starts is left about 1 in. above the bedding medium. In time, that is to say when the plant has become established, new plants, each with their own down-thrusting roots, will arise around the parent plant from the visible rhizome.

C. willissii is indigenous to Ceylon and, not unreasonably for a plant whose native home is close to the equator, plenty of warmth is essential for its success. In a word, a temperature range of 75°F. (24°C.) to 85°F. (29°C.) is called for.

Fishes of the Characin Family

A beginners' guide

by M. J. PARRY

THE majority of fishes included in the large Characin family are native to South America (particularly the Amazon Basin), and Africa, and belong to the order Ostariophysi, together with the Carps and Catfish. They are easily recognised (though there are certain exceptions) by the presence of an additional fin—the adipose, which is a small fin situated between the dorsal fin and the caudal peduncle. In the majority of cases all are scaled and also possess teeth.

The group is relatively hardy, preferring a temperature in the mid 70's (°F.). They are happiest in a well-planted, well-lit aquarium containing neutral or preferably acid water, pH 6.2-7.00. Live, meaty food is appreciated. In general they are peaceful aquarium inmates (though sometimes not averse to a little fin-nipping), the noted exception being the notorious Piranha (*Serrasalmo* spp.) which swarm in the jungle rivers of South America, and which will rip to the skeleton, within minutes, any luckless human or animal falling into the water.

The choice of characins for the home aquaria is not such an easy matter as first appears as regard must be paid to the ultimate size of the fish, there being great diversity in this respect within the family. In this article, therefore, I have deliberately separated fish of under two-and-a-half inches from those above this size, as in this way the aquarist may judge how his particular needs can be accommodated.

The genus *Hypanobrycon* contains many excellent species, undoubtedly the most popular being the Neon Tetra (*Hypanobrycon bimaculatus*), which grows to a length of 1½ inches. This particular species set the aquatic world on fire upon its introduction in the mid 1930s, much work being done to popularise it by the famous American

ichthyologist, William T. Inner, in whose honour the scientific name was bestowed. The predominantly attractive feature of the fish is the electric blue line running horizontally down the body where it is bordered by a reddish flush as it nears the tail.

It is recognised that for breeding it is by every means an "expert's" fish and, indeed, my only knowledge of these principles are "second-hand" as it were, due to its breeding by (at that time) a fellow South Wales aquarist, Mr. D. W. Amis, whose record of this success was published in the August 1964 edition of *The Aquarist*. As a final thought it should be borne in mind that the retail price of the Neon Tetra was as much as four times its present cost only 15 years ago. It does appear, therefore, that these fish are now being bred in much larger numbers through experience, and it is to be hoped that with the advice of our German friends (who seem to be the most successful) it will, one day be as easy to breed this species as it is to breed guppies!

A close relative of the aforementioned species is the Glowlight Tetra (*Hypanobrycon gracilis*), another handsome species and an excellent "community fish." It attains a length of 1½ inches.

I well remember an aquarium successfully maintained by a good friend of mine exclusively devoted to this species, and which was expertly planted with *Cryptocorynes*. A layer of bale peat was placed under the gravel to a depth of about one inch in order to acidify the water (and also to turn it a light amber colour, thereby enhancing the colours of the fish), and I must admit that everyone who saw it was enchanted by its beauty. The fact that the gentleman concerned went on eventually to breed these



Penguin fish



Piranha (*Serrasalmo* species). Interesting but not a popular characin!

fish does, to my mind, denote a correctness to the approach of their keeping and may well be copied by fellow enthusiasts. The liking of the Characin family for acid water is clearly shown in this example as pH was in the region of 6.00-6.2.

Having written in some detail about the more difficult (breeding-wise) members of the family it should be explained that these are only exceptions to the general rule. Species such as *Hyphessobrycon serpae* (Serpae Tetra), *Hyphessobrycon flammeus* (Flame Fish), *Hyphessobrycon scholzei* (Black-Line Tetra), *Hyphessobrycon pulchripinnis* (Lemon Tetra), and *Hyphessobrycon heterorhabdus* (Belgian Flag Fish), all of which are attractive and dainty aquarium fish, bred in a standard manner, which will be explained in due course.

The genus *Hemigrammus* is popularly represented in the aquarium by three species, *Hemigrammus pulcher* (Diamond Tetra), *Hemigrammus unilatus* (Feather-fin), and *Hemigrammus ocellifer* (Beacon Fish). The last of these species, *H. ocellifer*, derives its popular name from the bright colours which glow in the eye and on the upper edge of the caudal peduncle. It is an excellent shoaling fish, reaching a maximum length of 1½ inches. It is unfortunately true of this fish that it is highly susceptible to white spot disease (*Ichthyophthirius*), and in the community tank is usually the first to show signs of the disease's outbreak. It is a wise precaution, therefore, to completely quarantine the species in an aquarium exclusively devoted to this usage before introducing them amongst other fish.

Members of the Characin family known as Pencil Fish are fast becoming popular among aquarists who are learning to appreciate their excellent shoaling habits. Among the most sought-after of such fish are *Neonotomus ananias* (1½ in.), *N. marginatus* (1½ in.), *N. trifasciatus* (1½ in.), *Pencilbrycon hartwegi* (2 in.) and *P. auratus* (2 in.).

Other suitable aquarium inmates below the length of 2½ inches are *Pristella riddlei* (X-Ray Fish), translucent in colour, with attractive yellow and black markings on the dorsal and anal fins; *Aphyocharax rufipinnis* (Bloodfin), which has a streamlined body of a greyish colour with the anal, dorsal and ventral fins coloured a brilliant blood-red; *Thayeria ohstgana* (Penguin Fish) which has, over the years, gained great popularity principally because of its peculiar swimming motion. Whilst swimming it maintains a horizontal position but when relaxed adopts a position at an angle of 45°; *Gymnocorymbus terezae* (Black Widow), a great personal favourite, which appears to wear a "black skirt" covering the dorsal and anal fins and the hind portion of the body particularly in young specimens. Unfortunately this depth of colour is lost with age.

Within the larger group several interesting species spring to mind and not least the Splashing Tetra (*Copysia ornata*), which attains a length of some 3 inches. Its unique breeding methods are well known in that it leaps out of the water to deposit its eggs on an overhanging leaf or piece of slate and thereafter, with the action of his tailfin, the male continually splashes the eggs with water in order to keep them moist. The male is distinguished from the female by the white spot found on the base of his dorsal fin. Truly, an interesting fish, though one which, in my experience, is somewhat difficult to keep in good health.

Seemingly an unpopular species, particularly among the ladies, is one of the oddities of nature, *Aneptichthys jordanii* (Blind Cave Fish), which reaches 3 in. These fish, originating from a range of underground caverns in Mexico, have no functional eyes, only sockets. Undoubtedly their need for these seemingly essential organs diminished over centuries, they being confined to regions where they have bred without ever seeing daylight. It must be stressed, however, that there is absolutely no cruelty in keeping these fish as they are quite able to get about the aquarium without colliding with either rocks or plants. In addition

they are able to locate food as easily as any other occupant.

Reminiscent of the fearful Piranhas are members of the *Metoysis* genus, *M. roosevelti* and *M. schroederi*, both of which attain a length of 6 inches. They are excellent shoaling fish demanding very little in the way of attention, except a temperature in the mid 70's (°F.). They have an intense liking for vegetable foods and unless provisions are made in this respect the aquarium will soon become devoid of all plant life. Chopped spinach and lettuce (when in season) seem to fit the bill admirably. They have been bred occasionally in captivity though still remain "problem fish".

Whether the Giant Pencil Fish (*Acanthopoma anatumus*) should be included in an article exclusively devoted to members of the characin family is a subject of great recent debate, since the publication in 1962 of the book "Fresh-water Fishes of the World," by Professor Günther Sterba (Vista Books, London, 84s.), as in his excellent work Sterba maintains that this species is a member of a separate family, viz. the *Acanthopomidae*. To my knowledge he is the only author to hold this view, and I would be extremely grateful to hear from any reader of *The Aquarist* who has similar or opposing views on the same subject, explaining how his/her conclusions are reached.

The Giant Pencil Fish is a close relative of several species of Headstander (which Sterba also includes in the same family) including (among others) *Abramites microcephalus* and *Chilodus pumilus*. A recognisable characteristic is the oblique angle of the body, and its constant scouring of the bottom for food. It reaches a length of 5 inches.

Finally, I wish to deal with a fish which by its beauty, grace and petite appearance, has done much to convert the layman's thoughts to the keeping of fish, the Cardinal Tetra. It may seem strange that this fish is dealt with out of category, but for this I make no apologies as size of its tank-mates should never determine whether or not this fish should be kept. If they are to be kept, then, to my mind, it can only be done one way: as a shoal, in an aquarium especially devoted to this lovely species.

In appearance it is a larger and even more gaudy version of its cousin, the Neon Tetra. Upon close examination it may be distinguished from that species by noting the vivid blue stripe which, in the Cardinal is much straighter, and also continues into the eye.

The breeding performance of most members of the



Black Widow

Characin family follows a standard pattern, with minor differences according to species. It is as follows:

The chosen fish should be separated for a period of approximately 10-14 days, and fed liberally on such live foods as *daphnia*, *Tubifex*, grubs, earthworm, white worm, shredded earthworm, etc., in order to bring them into breeding condition. Sexes may generally be defined by the plumper appearance of the female over the slimmer males. (Great play is often made of the "Characin Hook" as a means of sex-definition, though this advice I cannot endorse, and will, therefore, elaborate no further on the subject).

The breeding tank should be set up so as to include acid to neutral water pH 6.2-7.00. Clean compost should carpet the bottom which should be thickly planted at one end with bushy plants such as *Cabomba*, *elodea densa*, hornwort, *rotella*, etc., cleansed of snails. Temperature should be maintained within the region of 75°-80°F.

The pair of fish should be introduced late at night in order that they might spawn early the following morning. Breeding commences with the male chasing the female around the aquarium and through the plant thickets until,

when exhausted, they rest above the plants and, quivering side by side, the female expels her eggs which are immediately fertilised by the male. Spawning continues for about an hour when approximately 100-200 eggs will have been daily fertilised. Both parents should now be removed.

The eggs hatch within 30 hours when the minute fry will be seen clinging to the plants. The fry generally become free-swimming on the third day and for the first fortnight their diet should consist of *Infusoria* or newly-hatched brine shrimp. As they grow, microworm and finely-sifted *daphnia* can be given. Within six months they will have grown sufficiently to be given the usual adult foods.

Fishes of the Characin family will be found well worth the time and trouble involved in breeding. In this article I have just scratched the surface in the recommendation of characins for the home aquarium. In Sterba's masterpiece details of 141 fishes to be found within the family are given, and this is a book that can well be recommended to every aquarist, whether actively engaged in characin keeping or any other branch of this fascinating and informative hobby.

Keeping Children Out

by B. A. WHITESIDE

HAVING worked at the problem of rendering school aquaria safe from the harmful hands of pupils, I have come up with one answer to the problem which might be of use to other teachers. The following method is suitable for a tank sited on a wooden bench in a school laboratory, and so far it seems to have worked. As money for school aquaria is usually in short supply, this method is useful in that it does not cost very much.

First the tank is fitted with an all-over perspex cover "glass" in which three holes, just wide enough to take a heater wire, a thermostat wire, and an air tube, are bored. The filter, heater and thermostat are fitted in place in the aquarium and the free ends of wire and air line are drawn up through the holes which have been bored at the back corners of the perspex. The leads are then connected to plug, air-pump, etc. Heater and thermostat holders are necessary as these will prevent the glass tubes from moving about when the cover "glass" is moved for cleaning. It is now not possible to remove the perspex cover without also removing the heater and thermostat but this should not be necessary for a long time anyway as the cover can be tipped up using the back frame of the tank as a pivot when the tank needs attention.

The cover is held in place by three strips of aluminium sheeting, about 2 in. wide, riveted together, as shown in the diagram. The two strips running from the front to the back of the tank have their front ends bent to fit closely over the front edge of the perspex and to catch under the top front edge of the angle-iron frame of the tank. The longer piece of aluminium is bent into the shape of three sides of a rectangle with an extra 3 in. protruding on each end bent at right angles. A hole is drilled through the aluminium strip and through the bench on either side of the tank. Two bolts of appropriate length and diameter are inserted through these holes and a washer and nut are screwed on the lower surface to hold the strips tightly in place. The back ends of the two top strips can be left free or bent over the back frame.

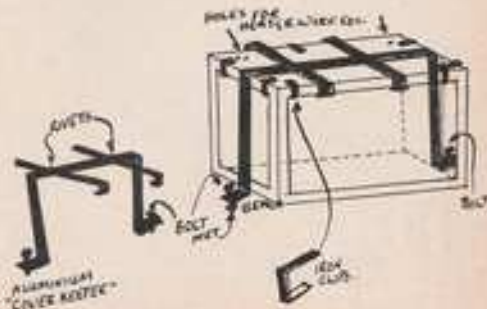
When the cover light is fitted on top of the perspex it tends to cause sagging in the middle because of the heat emitted. This will result in the perspex bending up

away from the top frame. This problem is solved by making about eight small iron clips, in the shape of three sides of a rectangle, to clip over the top frame of the tank and the perspex, thus holding it in close contact with the frame top.

All these fittings may sound highly complicated and difficult to make, but they could be easily made in the school metalwork department in half an hour. What about the look of the tank after the addition of these fittings? If they are painted to match the frame they will go almost unnoticed when the light cover is in place.

To feed the fish, one of the corner clips can be removed and the perspex bent up slightly. Food can be inserted on the flat blade of a penknife and shaken into the water. In a well planted tank, which is not over crowded, there have been no adverse effects from having the whole of the tank top completely covered with perspex, thus cutting off contact between the water surface and the air.

For weekly servicing, the two bolts and the clips can be quickly removed with a pair of pliers and the cover pivoted back. Under normal class supervision, and without the use of a pair of pliers, pupils should not be able to get at the tank's contents. It is well worth the trouble involved, to be able to keep a tropical aquarium in school, and most metalwork teachers or laboratory assistants would be pleased to make the required fittings. A metal cover light is something else which could be made by the metalwork department as well.



An Unusual Garden Pool

by NEIL WAINWRIGHT

WHEN designing a "natural" pool it must be sited at the lowest level of the garden, for it is to this area that water will naturally gravitate. This means that a hole (perhaps of some considerable size) must be excavated, with the possibility that the "spoil" may consist of chalk, clay or stones that may create problems as regards disposal.

The pool described below overcomes much of this difficulty. By building above ground level only a bare minimum of excavation is essential. It is necessary to plan the pool on formal lines but the design offers particular advantages for property from which the builders have only recently moved out. Such a property normally has plenty of builder's rubble that must be disposed of and the banks at the sides of the pool form an excellent hiding place for this.

The base of the pool must be marked out with wooden pegs and string but to give a firm foundation for the walls an allowance of about 9 in. is made on these dimensions. Within the marked area the grass is removed and the earth well rammed. This preliminary tamping is essential if the pool is to be satisfactory.

Shuttering is erected round this area and is made of 5 in. by 1 in. wood, or 4 in. by 1 in. wood if the pool is a small one. The wood is put on edge and provided that it is not too badly cracked it need not be of high quality. This shuttering must be firmly braced with small posts driven into the ground at intervals along its sides, special attention being paid to the corners (see plan view at Fig. 1). The tops of the posts must be sawn off level with the top of the shuttering and the latter is nailed with the top of the shuttering and the latter is nailed with the top of the shuttering and the latter is nailed with the top of the shuttering and the latter is nailed with the top of the shuttering to prevent the concrete sticking to it.

The concrete is a mixture of sand, cement and ballast in the proportion of 1:2:3, the ballast being of $\frac{1}{2}$ in. to $\frac{3}{4}$ in. size. These items must be mixed thoroughly in a dry state, then the water is added gradually, turning the concrete

with a shovel as the pouring is done so as to ensure a smooth, creamy consistency. The old rule of "mix three times dry and three times wet" is a good one to follow.

The concrete is poured into place and rammed down well. To finish off a long board is laid on edge, and with somebody holding it at each end, is tamped down on to the concrete and carried forward slightly with each stroke so that the concrete is smoothed off cleanly.

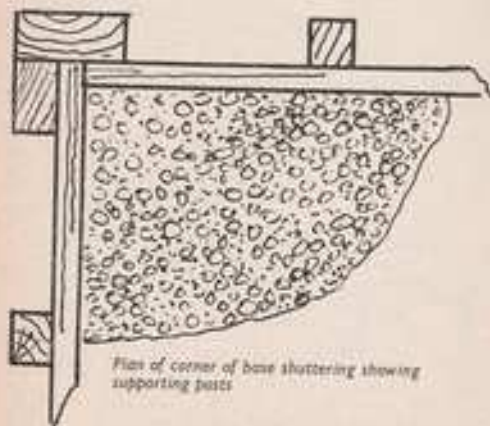
Damp sacking is laid over the concrete until it has set. If the sacking dries out it should be lightly watered with a fine sprinkler.

The depth of the pool should never be less than 2 ft. 6 in. or the loss of fish in a severe winter may be high, and it may not be a disadvantage to increase the depth to 3 ft. In addition, it is advisable to provide a step round inside edges of the pool in which to plant the shallower-rooting aquatic.

Shuttering for the walls is again of 1 in. thick wood, and all four walls must be cast at the one time. The boarding is nailed on to stout posts and is erected on the base in the form of two box shapings, one fitted inside the other with a distance of 4 in. between the inner face of the outer box and the outer face of the inner box. The outer box (the outer edge of which is set just inside the edge of the base) must be very firmly strutted, while the inner box must also be temporarily strutted across the top or similarly strutted so that it cannot move under the thrust of the concrete. That part of the base that will be covered by the walls is roughened with a pick to give a better "key" to the concrete.

(In parenthesis it may be thought that the dimensions quoted for the thickness of walls, etc., is excessive, but the weight of water will exert considerable pressure and, unlike a sunken pool, the thrust cannot all be taken by the surrounding earth.)

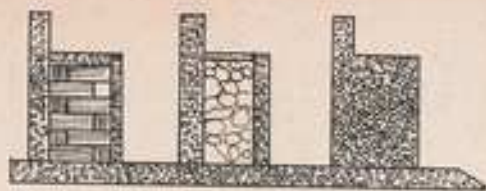
The concrete for the walls is mixed in the same proportions as for the base. It is poured between the box shap-



Above—Use a long plank to tamp base (posts on shuttering not shown)

Below—Method of bracing shuttering for walls





Alternative methods (brick core, rubble core and solid concrete) for making step inside pool

ings and rammed down firmly so as to avoid air pockets. Small pieces of iron bar or galvanised mesh may also be dropped into the concrete to serve as reinforcement, but such material must not be allowed to move into a position where it will show when the shuttering is removed. The concrete must be levelled off across the top and covered with damp sacking until it has set.

There are alternative ways of making the step. If sufficient bricks are available a simple form of wall can be built to finish 6 in. to 9 in. below the level of the side walls. The bricklaying need not be of a high standard but there must be no continuous vertical joints in the brickwork. The top and front of the brickwork must be covered with a thin coating of cement. Alternatively, a wall can be built inside the first, using shuttering in the normal way, and the space between inner and outer walls filled with rubble before the top of the step is closed in with a layer of cement. A more extravagant way of making the step would be to erect shuttering inside the pool and to cast the step as solid concrete. In all cases the concrete must be cured with the aid of damp sacking.

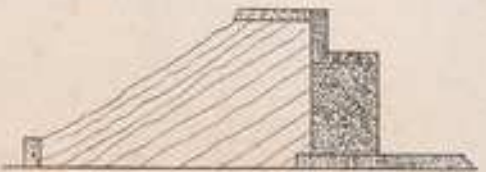
Before testing out the pond for leaks it is advisable to build the surrounding banks, as these will help to take the pressure of the water.

The simplest way of making the banks is to pile rubble, etc., against the sides and cover this with earth, keeping the latter at not too steep an angle. It is possible to achieve a very natural effect by the judicious use of large stones and suitable plants.

The banks can be made rather stronger if dwarf walls are built at an appropriate distance from the sides of the pool and the rubble and earth put between the walls. If the pool is large enough, steps can be cut into the bank, but alternatively a few "stepping stones" at strategic positions will avoid damage to the plants.

The top of the pool may be finished off with a small paved surround. This is most easily done with paving stones cut in shallow, lidless wooden boxes. If desired, lines can be drawn in the top of the concrete before it has hardened (using a trowel or pointed stick) so as to simulate crazy paving. The paving stones should be bedded firmly on to a sand or ash base.

It is a well known fact that concrete contains a certain amount of lime, and the pond must be freed of this before fish or plants can be put into it. The most satisfactory method of freeing the pool of lime is to fill it with water,



Section across part of pool showing dwarf wall and earth bank

allow it to stand for a week, and then empty it, following this by scrubbing the inside of the pool with clean cold water only. This must be repeated at least six times and the pool is given a final disinfecting treatment by putting a few permanganate potash crystals in the water, again allowing it to stand for a week before draining it off. A sufficient quantity of the crystals to stain the water a deep pink should be used.

This is obviously a very long business and some pond builders make use of agents (such as waterglass) to seal the lime into the concrete. This can be quite effective provided sufficient coats of the agent are given and that the whole of the inside of the pool is covered at each coating.

It will, perhaps, be rather surprising if the pool does not show small leaks when first filled with water. If these are very small they can often be remedied with a pure cement mixture. Large cracks can be opened up slightly with a brick chisel so that the widest part of the crack is on the inside of the pool and a waterproofing compound may then be used to plug the gap.

Only the basic construction of the pool has been described above. Much will depend on the builder's ingenuity to blend it in with existing or planned garden features so as to provide an attractive layout. After all, fish can be kept in a static water tank, but four concrete walls and a base alone do not make a garden pool.

Cryptocoryne Affinis

by B. FRY

A NATIVE of the Malay Peninsula, *Cryptocoryne affinis* is one of the choicest aquatics to introduce into a heated aquarium. Its sea-green leaves, made doubly attractive by the grass-green mid-rib and side-veins, and purplish undersides, are long and lanceolate in shape and held aloft on narrow brown-green stems. Stems and leaves combined measure about 6-10 inches in length.

This *Cryptocoryne* is one of the easiest members of its genus to grow because all it demands is clear, soft water with a pH reaction of about 6.8, a non-caky rooting medium, and a subdued light. All the same, the most handsomely proportioned and coloured leaves are seldom obtained in ordinary aquarium compost alone. What it needs for really luxuriant growth is a 50/50 mixture of pulverised peat and yellow clay kept open by the addition of some non-calcareous grit or coarse sand.

Within a year of establishing itself in such a cosy bed, one plant of *C. affinis* will surround itself with numerous offspring. These young plants arise from the parent plant in all directions underground. Apart from the high decorative value of *C. affinis*, it is invaluable for providing hiding places and spawning places for fishes such as Rasbora, tooth-carps and barbs. The plant is sometimes called, quite erroneously, *C. haerzliana*, after Herr Hermann Haerzli, the Dresden propagator of, and dealer in, tropical plants and fishes, who first made it available to hobbyists in Europe and America a few years after the end of World War II.

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.

Collecting Tubifex

IN your "experts' answers to tropical queries" December issue 1965, you give a method for extracting tubifex from mud which is a rather slow method.

I have been collecting tubifex for years and have tried out many methods, and the best so far is as follows.

Your equipment should consist of a hand flour-sieve of approximately 8 in. diameter. The whole of the handle is fastened to a pole or broom stick with two small hose-clamps obtainable from any garage. Insert the side of the sieve into the top inch of mud and pull through the mud, tilting the sieve slowly to an upright position as you proceed until the sieve is approximately three-quarters full, and then raise until the top of the sieve shows half an inch above the surface of the water. You then shake your pole fairly vigorously (avoiding mud slopping over the edge) and you will find the mud will pass through the sieve and the bulk of the tubifex remains in a fairly clean condition. This, of course, you tip into a container and start all over again until you have collected sufficient for your needs.

The ball of tubifex thus obtained is taken home and placed in an old bowl under a slow running tap. After about 6 or 7 hours the clean tubifex will be showing. I then tap the loose ball and the worms gather tightly together and can be lifted, and the remaining debris which could not pass through the sieve will be found at the bottom centre of the ball and is easily removed. I usually clean the worms for two days before feeding.

Incidentally, when tubifex is seen in a stream or brook, you should search amongst the roots of the grass at the very edge of the stream and in all probability you will find small balls of clean tubifex clinging to the roots.

For your information, the largest single ball of tubifex I have lifted (I should say dragged to the side of the stream) measured just over 14 in. diameter and 3½ in. thick and no removing of debris was required.

S. G. LAWSON,
Vice-President,
South African Aquarists' Assoc.

Satisfied Customer

AS a regular reader of your magazine may I say how helpful I find most of the articles. This month (January), however, you have excelled with three reports that I cannot let pass without comment.

Firstly, the article by K. N. Puleston on 'Shedding some light on Aquarium Plants'. This has saved me a good deal of experimentation as my own efforts were proceeding along the same lines. However, I had only reached the fifth stage concerning the introduction of the Gro-Lux



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

tube, but now I will save myself a lot of trouble. I have added a tungsten strip light to my existing 'warm white' fluorescent tube and sweet results!

Secondly, the article by Joyce Partridge on 'Breeding and Keeping Daphnia in the House'. I had already had limited success with a culture kept in an old kitchen sink on the floor of my greenhouse but nothing to be compared with what has happened since using a plastic bucket and liquid-fry food as suggested in her article!

Lastly, the article by John Graham on the most accurate method for assessing the number of small fish that can be safely kept with a given water/air surface. I had often wondered about the discrepancy between the two time-hallowed methods as found in the books, but had not really sat down and puzzled it out. (Not being mathematically inclined I suppose!).

May we continue to have such helpful contributions month by month from those more experienced of your readers.

L. C. JOHNSON,
Harefield, Middx.

More Support Needed for Marines

BOTH the excellent society of which I have the honour of being show secretary, and myself, personally, have come under great fire and much adverse criticism regarding my letter on the subject of the non-inclusion of marine classes in societies' open shows, reprinted in the December issue of your journal.

Much of the correspondence I have received on the subject, however, indicates that points I was attempting to raise have been totally misunderstood. I would, therefore, be sincerely grateful if the following comments could be printed in order to clarify the situation.

Primarily, my criticisms were not in any way directed at the classes generally catered for in show schedules, or their relevant diversities, but solely at marine classes which, at the time of writing, and to my knowledge, are only sponsored by two clubs, viz: Newport and Portsmouth. There are several societies which promote classes for over 60 groups of fish, but not for marine fish, either tropical or coldwater. (Mr. Lister of the Airborough and District A.S. please note). Many societies continually maintain that they are progressive and go-ahead, yet they continually refuse to speculate in such classes, seemingly restricting their ideas to the perennials of aquatic shows, to the exclusion of this fascinating branch of the hobby.

The indications that such classes are required can be no further emphasised than with the founding in recent months of the Marine Study Aquatic Society of Great Britain.

COLOUR in and Around the POND

WITH the onset of Spring the fireside is forsaken for the garden and it is at this time that improvements and additions are planned for the coming season. The idea of an ornamental fish-pond occurs to many garden-lovers but is too often shelved through want of knowledge on the subject or the fear of embarking upon a project which may prove too fraught with difficulties to handle. To dispel such fears and shortcomings, we have pleasure in presenting, in this and the next issue of "The Aquarist", two supplements designed to encourage and assist intending pond-owners to realise their ambitions. Our contributors are experts in the field of water-gardening and their detailed descriptions of pond-construction, pond-planting, stocking with fish and general maintenance are fully supported by colour and black and white photographs.

It is hoped that our readers will find these features instructive as well as interesting and we would like to remind them of our monthly service in which our experts freely and gladly answer by post any query which may be posed on the various aspects of garden-pond maintenance and the care of pond fish.



Photo: W. J. Howes
A garden pond of natural appearance photographed at Bagner, Suisse



A flowering shoot of the water primrose
Ludwigia odotcendens



Firecrest (centre) is a lily that grows well in the shallow pond

POND CONSTRUCTION AND MAINTENANCE



Above: Easy to install are the fibre-glass ponds such as illustrated here. Paving or rocks are used to conceal the edges of the tuckered pond.

A GARDEN pond can be an outstanding feature if it is located correctly. The sight of water with reflections of plants and flowers is always a focal point in any garden. Most aquarists want a pond in which to keep and perhaps breed a few fishes and there are few gardens which cannot accommodate a pond even if it is a small one. When one considers the position for the pond some special consideration is necessary. If the pond is to be a concrete one then it is essential that it is sited correctly in the first instance as it will be impossible to move it later. It may be that the shape of the garden or its size will determine the pond's position, but if there is a choice see that it is not in the lowest part of the garden where rain-water will drain into it from the surrounding ground and may not be to advantage since harmful matter may be introduced to the pond in this manner.

If the pond can be made on rising ground it will be easier to empty the water out if necessary as it could be siphoned out with a hose or pumped out with a small electric pump. The pond should not be sited under trees or large bushes. It is sometimes an advantage to have some shade for the water to check the formation of too much green algae but it is better to try to get as much light as possible to the pond and then to shade out if necessary with top-growing plants such as duck-wood.

Having made up the mind as to where the pond will be, the shape is the next consideration. This may depend on the type of garden. If the garden has straight paths and straight-edged flower-beds, it will be better to make the pond a formal shape—either square or oblong. On the other hand, if the garden has winding paths or irregularly shaped flower-beds, it is better to make the pond in keeping with it. It can then be either round, oval, kidney-shaped or irregular.

There may be a rockery in the garden and it may be that the pond will be made near or adjoining it. If so the pond should conform to the general shape of the rockery, or may be running away from it in a rough kidney shape. Also if the rockery is fairly high it will be possible to so construct

Below: With the polythene pond filled with water, the edges of the plastic sheeting were anchored beneath stone slabs.





Above: The excavation with sand-layered base ready to receive the plastic sheeting

Below (right): Potted water plants will keep upright in the pond if the pot is set in a mass of concrete to support it

the pond that a waterfall can be incorporated with it, an added attraction always, especially if one or two small pools can be included in the fall.

Having decided where and what shape the pond is to be the next operation is to mark out the site. If it is to be formal in shape it is absolutely essential to be very careful with the marking out. Either a square or oblong pond must have its correct right-angles as nothing will look worse than a badly-shaped pond. A circular pond can be marked out with a centre peg with a cord attached and a ring and a marker on the other end at the required distance. When pegging out one must allow for the thickness of the concrete if this is to be used. To check the right angles of a straight-sided pond it is necessary to measure from corner to opposite corner, on the cross. If these measurements are correct then the corners will be square.

For marking out an irregularly shaped pond it can best be done by using a rope to lay on the ground. It can then be pushed into whatever shape is required and the outlines then pegged out. If plastic sheeting is to be used then there will be no need to allow space for the thickness of concrete. Where it is decided to incorporate a bog-garden with the pond it is essential to see that the concrete for this garden is made at the same time as the pond proper, or it is probable that a leak may ultimately occur at this joint. The decision to make the pond either with concrete or by using plastic sheeting will depend on the amount of work the owner is prepared to put into the project. The concrete pond is the more permanent type but takes more hard labour to construct. The trouble with a pond made with plastic sheeting is that if it is necessary to have some folds in the material at the corners and these may look rather unsightly. Also it is necessary to provide some anchorage at the edges. If this is done by laying broken paving stones on it the edges of the plastic can be hidden from view. There are also fibre glass ready-made pools but I have not seen many of a size to be useful to the intending breeder of fishes.

If it is intended to breed a few fishes in the pond it will be an advantage if a shallow portion can be provided. It is well known that most fishes prefer to spawn in shallow water and it is possible to construct a shallow area to any pond once it has been constructed by adding a shelf where required.

Having decided on the size and the method to be used in the construction, the necessary material should be obtained. The actual size of the pond will depend on the space available and the amount it is intended to spend on the project. Although a small pond may be cheap and easy to make it is certain that it will be harder to keep the pond and its inhabitants in good condition ever after. Small pools suffer from rapidly changing temperatures and so the fishes will not be as contented and healthy as they would be in a larger pond. It may be asked what a fair-sized pond should be. If one can be made not less than sixty square feet in surface area it should be large enough to accommodate a fair number of fishes but yet not be too large to manage comfortably. A very large pond can be rather difficult to manage as one needs to be able to reach all parts of the pond with a long-handled net, or to be able to reach any water lily leaves requiring attention.

If the pond is to be of fibre glass or plastic sheeting lined, it will be necessary to remove the necessary depth of soil and then to ram well down so that the base is very solid. If plastic is to be used make certain that there are no stones in the base which might puncture the plastic; this is most important. The finished depth of the pond should not be more than two and a half feet and two feet is quite enough for most fishes. Remember that if the water is very deep the lower part can be very short of oxygen and so the fishes are not as likely to thrive as if the pond-water was more shallow. If the pond is only about a foot deep



there will be the danger of freezing over almost completely in severe weather and there will be insufficient depth for such plants as water lilies.

There is one point I must make here and that is the sides of the pond should not be made perpendicular. Natural ponds have sloping sides and so they will be an advantage in more ways than one for the garden pond. Even for a formal pond the sides can be made sloping. This obviates the need for shuttering which will cut down the cost of construction considerably. If the sides have a slope of about 45 degrees, then there is no need for any shuttering, as the concrete can be floated up quite easily.

If the pond is to be made with concrete it is still necessary to make the base very firm by ramming thoroughly. The firmer the base before concreting the better will the finished job be. Many pond-makers use a special cement to add to the usual mix to render it water-proof. I do not think that this is essential as it is possible to make concrete with the ordinary builders' cement which can be quite water-proof.

There are two methods of making the concrete for the pond. One is to make a very coarse mixture (not too wet) first and then to add another coat of a stronger mixture afterwards. I prefer to make my mixture in one go as I know that it is very difficult to get fresh cement to wed to old and even after a day's interval the joint is always a weak spot. If a good mixture is made with aggregate (coarse), sharp sand and fresh cement, it is possible to tamp this down in position so that the larger stones go to the bottom while a fine strong coating rises to the top. This method ensures that there is no possibility of a leak occurring where the two coats join. A good mixture for this method is three parts sharp sand, two parts coarse aggregate and one part cement. Mix at least three times dry and three times wet. Do not make it too wet and apply it into position as soon as possible after adding the water. If a friend can be contacted to help at this point it will be a great advantage to prevent any delay in getting the mixture in position before it can start to go off. If it is intended to make the pond with stone or brickwork, it is most essential to ensure that a very strong mix is used and that it adheres to the brickwork very securely or there will be trouble ever after. All concrete should be sprayed occasionally during dry weather to prevent a too quick setting. Concreting should not be done in frosty weather.

Once the concrete has set the pond should be made ready for planting. A certain amount of free lime will form on the concrete which could be dangerous to the inhabitants but to remove this, all that is necessary is to scrub it round with a stiff broom.

Whilst the concrete is setting some water may be sprayed on it so that it does not dry out too quickly and some water may be allowed to lie in the bottom. Two scrubbing should be sufficient to remove the free lime. There are materials sold to seal this in but there is always the possibility that with time this coating may be removed and the lime escape into the water.

Pond Maintenance

If a concrete pond has been soundly constructed, it should not need a great deal of maintenance, apart from the repair to cracks after periods of severe winter weather. Occasional wholesale cleansing is necessary every four or five years when the removal of all fish and plant stock and the drainage of all the water can be effected. The empty basin can then be thoroughly scrubbed with a stiff broom after the accumulated mud and detritus has been baled out. The plants should then be thinned out and re-introduced to the new water and the pond allowed to "settle in" once more for three or four days before replacing the fish.



POND PLANT PESTS

Opposite—Top: Great Pond Snail (*L. stagnalis*)
Centre: Caddis fly gut partly emerged (from protective case)
Bottom: Eggs of *L. stagnalis* on Lily Leaf

WATER plants are susceptible to pests as are most ordinary garden plants. However, they can be kept under control fairly easily although it must be realised that insecticides cannot be used. Any of these containing D.D.T. would be fatal to the inhabitants of the pond. The pests which are likely to attack plants under and on the water are water snails. The two kinds which are found in many ponds are the Great Pond Snail (or freshwater whelk), *Lymnaea stagnalis* and the Ramshorn, *Planorbis corneus*. The latter is not as likely to be as harmful as the former, which will eat many leaves of the various water plants. The Ramshorn snail will eat some soft forms of vegetation but it is probable that the food that it takes will be that which is starting to decay. Whether it is useful to include water snails in a pond is debatable. Their young can be eaten by many types of fishes but this food is not very important as enough food can always be given for the inhabitants. Apart from the damage which snails can do to the water plants they can also eat fishes' eggs and so if it is intended to breed any fish in the pond snails must not be added. It is sometimes said that they help to keep the water clear. This is not so; their copious droppings alone can soon make a problem unless there are sufficient plants to use up this matter.

The tall spikes of flowers such as *Pontederia cordata* and *Najas japonica flexilis*, can soon become smothered with black fly if they are not watched. As no insecticides can be used over the water the best way to remove them is with a strong jet of water from a hose.

A pest which could be introduced to the garden pond is the Caddis fly larva. The fly lays its eggs in or near the water and the larva, a tender-bodied grub, builds for itself a small covering almost like a shell of pieces of stick, leaves or sand. The larvae crawl about with their soft bodies protected from fishes by this covering and can eat the roots and young shoots of some water plants.

There is a water-lily beetle which is a small dark brown creature which eats the leaves of lilies but this is not very common and could be flushed into the water with the hose. One of the moths whose larvae can attack many water plants is the Brown China mark moth, *Hydrocampa nympheana*. The larvae can be removed by pushing the affected leaves under the water or again by flushing with a hose. Most fishes will take them if in the water.

Another trouble which can affect the plants is blanket weed, a form of Algae which can grow at an alarming rate if unchecked. This weed can choke out many of the water plants and covers leaves and stems with a mass of fine, strong, green fibrous growth. It cannot be eradicated from the pond by using any chemicals if there are fishes in the pond, and as it is a form of plant, anything strong enough to kill it would also kill the good plants. One way of tackling the problem is to use a broken stick which is twisted into masses of it and so remove it this way. Usually once a pond gets a good growth of water plants the weed is choked out.

A point to remember about most troubles with water plants is that as long as they are growing well they can withstand the attacks of most troubles. It is usually the weakly growing ones that are liable to attack.



A. BOARDER

Author

COLDWATER FISH-KEEPING

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BRENTFORD, MIDDLESEX.

Below: Some examples of problems submitted and answers given in the pages of "The Aquarist."

I have recently moved into a house which has a concrete garden pond in the garden. I emptied it and scrubbed it out after removing a large quantity of muck and mud. I refilled with top water, placed two water lilies in tin containers and two other submerged plants in flower pots, and added two large goldfish. The water is now as cloudy as when I began and I cannot see the fish. I have been told that it is not possible to keep the water clear, but I think that it should be better than it is now. What can I do?

In the first place you must not expect to set up a garden pond in the summer without getting some cloudiness to form in the water. It is quite possible to keep the water in a pond clear, but just as it is impossible to make wine in a few minutes so it is impossible to expect the water in a freshly set up pond to remain clear. There is always a certain time taken for a proper balance to be formed. Provided that there are enough water plants in a pond the water should stay clear, but the plants must be given time to become established. If your pond contains few, if any, growing water plants the water is sure to turn green if it is exposed to the light; this is a natural process. It is only when there are plenty of other growing water plants present in the pond that the algae, which cause the green colour, will die out.

Our pond is in a sunken garden and is about 12 feet in diameter and 2 feet deep. It contains approximately 50 large goldfish and many small ones, including golden orfs. It is proposed to fill in the sunken garden, the sides of the pond needing to be raised about 2 feet. This involves concreting, during which time the fishes must be re-housed. I propose moving them into six new galvanised iron tanks whilst the pond is being altered. My problems are: do the new tanks require treatment before putting the fish in? Shall I have to feed the fishes more frequently whilst they are in the tanks? What is the best way to treat the pond before returning the fishes? As the scavengers appear to have died out should I get some more to put in the tanks?

The new tanks can be dangerous to fish and so I suggest that you paint the insides with a bituminous paint, giving the top lip of the tank a coating. Wash them out when the paint is dry and they will be all right for the fishes. Do not feed them at all whilst they are in the tanks. They will not suffer harm for a month or two. You will not need any scavengers for the tanks as long as you withhold all artificial foods. Once the concrete in the pond has set it can be well scrubbed round with a stiff broom and well washed out. Do this twice, at intervals of a week; during the intervals the pond should be filled with water.



N. Attraction has large purple-crimson blossoms and is suited to depths of 2 to 3 feet

PLANTS for the Garden Pool

THERE are three main types of plants suitable for the garden pond. These are: under-water oxygenating plants, floating aquatics including water-lilies, and bog-plants for the pond-surrounds.

The water lilies are practically a must and few ponds would look attractive without at least one water lily as their flowers are so spectacular that they make an instant appeal to any visitor. Fortunately there are varieties suitable for ponds of all sizes. However, it is most important to ensure that the right type of lily is bought in the first place. It is easy for anyone to study the dealers' catalogues and find the kinds which will suit best for they are usually shown with the depths to which they are suited along with the colour. Otherwise it is better to leave the choice to the dealer after telling him the depth of the pond and the colour required.

One point which should be remembered is that a large lily is hopeless for a small pond but a small type can be used in a large pond as long as certain precautions are taken. Perhaps the large pond has a shallow end or a shelf and if so a smaller growing lily can be accommodated if required or the base of the container can be raised with bricks to the necessary level. Having decided on the types of lilies they should be ordered and the necessary planting material obtained. Much has been written about this and two problems arise as to which type is better. Some recommend a rich compost containing cow manure or similar substance and this is very good for promoting rapid and rampant growth but there is another consideration. One of the main tasks of the growing water-lily is to use up as nourishment much of the mulm and fish droppings in the pond. The more fertilisers which are added to the potting compost the less will the roots of the lily have to work. I consider that all that is necessary for the lily is some odd turves. These need only be chopped enough to



(Photo: Ashford & Belliss)

The fine aerial leaves and flowers of the arrowhead. The plant also has submerged grass-like leaves with valuable oxygenating properties



The water violet is a useful pond plant. The submerged leaves, shown here, oxygenate the water and protect baby fishes. Dainty white or lavender flowers are thrust above the water surface.



Ceratophyllum demersum



Iris kaempferi



Pontederia cordata attractive but must be kept in check

allow the roots to enter but not to such an extent that this matter can fall out of the container and pollute the water.

Most water lilies make rampant growth in three or four years and it must not be expected that the full beauty of a pond can be obtained in a year. One needs patience and if too many lilies are planted in the first instance it may not be long before the whole surface of the water is covered with lily leaves and the beauty of the pond will be lost.

Some very useful species of oxygenating plants can be picked from the following: *Ceratophyllum demersum*, a strong growing plant which has no true roots and is therefore very suitable for the concrete pond. It embeds part of the stems in mud and makes a fine plant for receiving fishes' eggs. *Elodea canadensis* is a plant with small leaves, a very good grower and suitable for spawning medium. *Lagarosiphon major* is a strong growing plant as is *Egeria densa*. *Ludwigia palustris* is a good one especially at the sides where the water is very shallow or even for a bog-surround. *Myriophyllum spicatum* is another suitable plant with finely divided leaves. Do not try to grow too many species of underwater plants, as they grow freely and the weaker growing ones could soon be choked out.

There are numerous types of plant suitable for planting at the sides of the pond and most of them can be set either in a bog-garden at the pond-side or actually in the water in shelves near the surface or on raised bricks etc. It will be found that they make rapid growth as water is always available even in times of drought when garden plants would suffer. Therefore it is essential to take care when setting out these plants. Three or four years can see the plants in such profusion that it can be a major task to cut them down again. *Caltha palustris* or marsh marigold is a good one for the pond-side and the yellow flowers resemble large butter-cups. *Pontederia cordata* is another fine plant with handsome leaves and a blue spike-flower; this can get out of hand if not watched. *Butomus umbellatus* is a flowering rush which is very attractive at the pond-side. *Mimulus luteus* or monkey flower is very good either just submerged or in the bog garden. There are some very fine hybrids of this plant to be obtained with large chocolate and red markings. Another fine flowering one is *Sagittaria japonica flor pleno*, which has arrow-shaped leaves and a spike of flowers which are double and white. Then there are the many lilies which will give a grand show of flowers and their long flat leaves make an added attraction at the pond-side. *Iris kaempferi* can be obtained in many colours and one at least is almost a must for the pond.



Escarboucle (variety of *Nymphaea alba*): large crimsan blooms are freely produced



Above and right: James Brydon
(variety of *Nymphaea alba*):
rose-carmine red blossoms, a
popular lily for garden ponds
and one that will tolerate shady
conditions in water depths of
from 1½ to 2 feet



Made up of many enthusiasts who, I have no doubt, are prepared to travel the length and breadth of the islands in order to find their particular interest and speciality catered for.

On Saturday, 17th September next, my society, on the occasion of its fourth annual open show (up to this year the only completely open show in South Wales) are preparing to accept a record entry in all classes. If our marine class contains only a few entries we shall not be deterred, as to our minds we will have added our contribution to the progression of the hobby.

Surely every aquarist's motto for 1966 should be 'Patronise Newport and Portsmouth—Patronise progress'.

Friends, Romans, countrymen, I lay down my shield; I end my crusade.

M. J. PARRY,
Show Secretary, Newport A.S.

Hiting Catfish

COULD you please insert the following in your readers' column as I think it will be to the interest and safety of all aquarists.

I purchased from a local tropical fish dealer an albino catfish three months ago.

On purchase it was two inches in length but it has increased to five inches in this time.

Losing several small fish from the community tank, I decided to remove this catfish to a smaller tank on its own.

After some half-hour's struggle and a wrecked tank in the process, I managed to catch it.

The catfish being as large as the net, I placed my hand over it to keep it in the net.

I at once received a severe wound on my finger together with a violent pain right up to my shoulder. This took some six hours to abate.

I cannot find any information regarding these fish, not even their Latin name in any aquarist book I have seen. I am enclosing a rough drawing of it.

W. BOWMAN,
Stockton-on-Tees, Co. Durham.



ED. NOTE—From the sketch and description this fish is probably *Clarias* species from the great lakes of Africa. Sizes equalling those of *Silurus Glanis* (The Wels) are commonly attained.

Top View

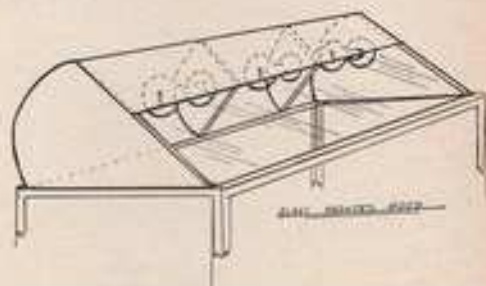
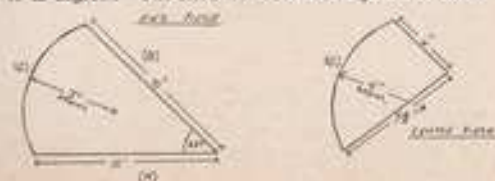
by P. E. PAVEY

A RECENT behind the scenes visit with our club to the Aquarium at the London Zoo made me realise what a lot we aquarists miss by not looking down upon our fish. No orthodox front view of the pig-eyed trigger fish can compare, I assure you, with the excitement of watching the vicious flapping of its dorsal fin from above. A top view gives you the thrill of watching the giant carp rising to be tickled; the thrill of seeing electric eels mere inches under your nose. And what applies to these Zoo giants applies—even if to a slightly less wondrous degree—to the tropicals in our home tanks.

In fact, from what other angle but a top one can you really appreciate the markings on the motionless wings of the butterfly fish outspread just beneath the surface, or the beauty of the Panchax and other top minnows? Plants, too. Seen only frontwise, all the loveliness of the floating plants is lost, not to mention the exciting rising and unfurling of the white flowers of the *Echinodorus radiatus*, or the—alas, too infrequent—yellow flowers of the Spatterdock (*Nuphar*).

So the outcome of that visit to the Zoo Aquarium had to be a re-designed hood, first for my three-foot tank.

The end pieces were cut from 5 ply wood. Their shape resembled nothing so closely as bread ice cream cones. The base (A) of both these end pieces was 10 inches long, rising one side (B) for 10 inches at an angle of 45 degrees. The third side curved in a part circle with



a radius of 5 inches (forming the top of the cone). Unless you have a bandsaw, cutting this can be tricky. I found it easiest to cut the wood away as closely as possible from all round the curve at a series of different angles and when the shape was almost perfect, to finish off by rasping.

Then came the two centre pieces, also cut from 5 ply wood. Both these had exactly the same shaped and sized curve as the end pieces, but their other sides were smaller: 4 inches and 7½ inches.

A sheet of aluminium, 3 ft. long, was then stretched over the curved ends and brought—for a distance of 4 inches—down the 45 degree angle. This was then nailed into position with copper nails. Now the two smaller shapes were nailed into place with a space of 12 inches between them. Into these, and the right-hand end piece, were fitted lamp holders. So much for the hood.

A length of rubber tubing was split and fitted along the front edge of the tank, not only to protect the tank itself from water splashes, but to prevent the glass from slipping out of position. This tubing could be continued all round the edges of the tank.

Lastly the glass itself—a piece 3 ft. by 6 inches—was laid into position.

Feeding is much easier than when I had to lift up the hood. And—not a point to be ignored—neither myself nor my guests now suffer from cricks in the neck at this tank!

OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

Can you tell me how to breed mealworms?

Mealworms, which are strictly speaking the larvae of the stored grain beetle (*Tenebrio molitor*), can be cultivated quite satisfactorily in a wood box or large tin half-filled with bran or flour, preferably the type known as rough-milled wholemeal. The box or tin should be kept close-covered with a perforated lid. A certain amount of warmth is essential if the mealworms are to prosper, and a shelf in an airing cupboard is a good place to keep them. After the mealworm larvae or beetles have been introduced into the container, a double thickness of damp, but not wet, sacking or thick rag paper should be spread over the surface of the culture medium to maintain the right degree of humidity. Nevertheless, any mould seen growing on the culture medium should be removed immediately. Several weeks may pass before sufficient larvae are ready to be fed to large fish, reptiles or amphibians capable of swallowing them (mealworms have tough skins). Thereafter, stirring and sifting of the culture medium to keep it well aerated, the removal of dead beetles and dust, and the addition of fresh bran or flour for the larvae to feed on are necessary at fairly frequent intervals.

How many different tropical fishes will I be able to keep without artificial aeration in a well lighted and well planted aquarium measuring 30 ins. by 12 ins. by 12 ins.?

This will depend on the size and general build of the species you intend to keep. If you confine your purchases to slender species of about the size of a full grown neon tetra, then your tank should support about two dozen fishes in comfort. But if it is your intention to include some of the sturdier species in your set-up (medium-sized barbs, for instance), then no more than 20 fishes should be introduced.

Would a shelf just above a powerful radio used quite a lot be a suitable place to stand a tropical aquarium, or would the sounds issuing from the loudspeaker prove injurious to the fishes?

Provided the aquarium is not actually rocked by violent vibrations, we do not think you need worry about the effect of the news bulletins or the latest pop releases on the wellbeing of your fish. You can, of course, help to protect the aquarium against vibrations by standing it on a sponge-rubber or thick felt mat.

I have read a lot about the bloodthirsty behaviour of the piranha fish, but a young *Serrasalmo nattereri* which has been in my possession for about ten weeks has proved less savage than many of the ichthids I have owned. For instance, it does not attempt to bite my fingers when I put my hand into its tank, and it shows no great interest in the guppy fry that I occasionally introduce into its tank as food. Do you think my piranha is uncommonly well behaved, or are the tales told about this fish highly exaggerated?

Although a few species of piranha are said to be quite mild-mannered and eat greenstuff as well as living food, the rest of them are extraordinarily savage and go quite wild at the taste of blood. We do not doubt that your fish will develop the same bloodthirsty traits as it grows older and larger. When that time arrives we advise you to keep your hands out of its tank.

Please give me some information regarding the fish popularly referred to as the golden loach.

This interesting member of the family Cobitidae is known to science as *Rasbora daniconius*. It appears to be fairly widespread over northern India and Pakistan and occurs in sluggish- and fast-moving fresh waters alike. In the wild

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

state the fish reaches a length of about 8 ins. but in the aquarium it rarely exceeds half this size. It is an active species and though it spends a lot of time foraging on the bottom, it does make fairly frequent visits to the upper levels of the water, especially when food is about. It takes live, fresh and dried foods readily. A temperature range of 72°F. (22°C.) to 80°F. (27°C.) suits it very well, and it is quite suited to life in a community tank.

Would it be possible to keep a pair of *Apistogramma nana* and a pair of opaline gouramis in a 26 ins. by 12 ins. by 12 ins. aquarium housing a collection of small cyprinids and characins?

A. nana should settle down quite well in a community tank provided plenty of bushy-growing or clump-forming plants are grouped at each end to give it good hiding places. Young opaline gouramis make fine community fish, but when they reach a fair size the males bully the females unmercifully, and all the dashing about that goes on among the two sexes sometimes has a deleterious effect upon the physical condition of smaller and less boisterous fishes.

Will guppies and white cloud mountain minnows flourish equally well in the same aquarium?

Yes, so long as it is not kept at too high a temperature; for White Cloud Mountain minnows soon weaken and die if kept too long at a temperature above 78°F. (26°C.).

What are the basic requirements of scats?

The basic requirements of scats are plenty of swimming space in non-acid water made somewhat brackish by the addition of a small quantity of evaporated sea-salt, and a temperature range of about 72°F. (22°C.) to 78°F. (26°C.). Although scats are omnivorous by nature and most largish ones are easy to feed, young ones are often faddy, and the only way to help reluctant feeders to develop a healthy appetite and grow to a good size is to offer them a variety of live and dried foods, and then make sure that they get generous supplies of the kinds they like best. Greenfood such as duckweed, nitella and shredded lettuce is also necessary for their health.

I have just bought a pair of paddlefish. Will you please tell me the scientific name of this fish, its country of origin, the size it grows to, and whether it is suitable for a community tank?

The paddlefish is formally known as *Coryspoma rina*. It is sometimes referred to as the swordtail characin. It is a peaceful fish that is native to Venezuela and Trinidad and attains a length of about 3 ins. Unlike most characins, it lacks an adipose fin.

I am going away for a week's holiday and would like to know whether my tropical fish will survive for that length of time without food. The tank they are living in will receive adequate lighting and aeration during my absence.

A week's fast will not do your fish any harm provided you build up their reserves of fat by good feeding before you go away.

I should like to grow a water-lily in my 4 ft. heated aquarium, and would be grateful for the names of one or two species suited to tropical aquarium conditions.

Perhaps the best water-lily for ordinary tropical aquarium culture is *Nymphaea dimorpha*. This small lily produces plenty of lavender blue flowers with yellow centres. *N. starbuckii* is another species that stays small. It produces white flowers only about 2 ins. across. These lilies

must have a good natural or artificial top-light, and a rooting medium of non-fibrous loam or yellow clay kept open by the admixture of some sharp grit.

What thickness and quality of glass should I use to glass a frame measuring 48 ins. by 12 ins. by 12 ins.?

You will find plate glass $\frac{1}{2}$ in. thick quite satisfactory.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

In answers to queries Mr. Boarder has mentioned "Prompt" cement. I have tried to buy this at various places but have only been met with blank looks and no success. Where can it be obtained?

Prompt cement can usually be bought from any good builders' merchant. If there is any difficulty, it can be obtained from the makers: Prompt Cement Products, Ltd., Bellwin Road, Camberwell, London, S.E.5. It is usually sold in tins and is excellent for repairing cracks in a concrete pond.

My goldfish have spawned this year and fry have hatched out. They are all dying off and I wonder if you can tell me where I have gone wrong? They developed fungus.

There are many ways in which your fry failed to survive. If they had fungus it is often caused by foul water. Once the fry start eating well the breeder often gives just that little bit too much dried food which is left uneaten. As a rule the water in the rearing tanks is rather warm and this makes the uneaten food turn foul very quickly. Not only does it remain uneaten then to get further purified, but the water turns foul. The fry then go off their food and trouble is certain to follow. It is a wise plan to feed with great care when the fry are young, especially if there are a number in the tank. If you let them go for a day now and then without giving any food it is surprising how they will improve and start searching for their food along the sides of the tank or on water plants. You should also change some of the water at least once a week. You must realise that a number of fishes will expel plenty of droppings which can pollute the water. If any of the fry appear to be off their food, give no dried food but live food only until they appear to be feeding again normally.

I have a male shubunkin about five inches long which has failed to fertilise any eggs from two spawnings. It drives well but does not seem to have the rumps on the gill plates, can you give a reason?

The fish may be old or sterile. Also the pair may not be compatible. It is also possible that the female is at fault. Try a different male or female as a pairing and you should then find out which one is to blame. Many male goldfish do not show the raised white dots on the gill plates but that does not mean that they cannot fertilise the eggs. Feed both fishes on plenty of garden worms.

Please send me a complete list of coldwater fishes suitable for a coldwater tank and their pictures as well.

If you get the book, "Coldwater Fishkeeping," as advertised in *The Aquarist*, it will give you all the information you need with photographs of the coldwater fishes you require.

After they had spawned I found that several scales were missing from the sides of a female goldfish. Do you think this could have been caused by the rough concrete at the sides of my pond?

When goldfish are chasing they often rub against the side of the pond and if this is rough it is very likely that some scales could be knocked off. They will grow in time

but there is a danger of fungus disease gaining an access at the wounds. A slight salt bath might help the fish but use block or sea salt, not packet salt.

My goldfish have bred for a year or two in my garden pond. Among the young ones are a number which we call black. They have not changed to the gold or red. What are they called?

These are usually called uncoloured goldfish and as such are of little value. Some strains take a long time to change and if several remain in the pond when they have not changed colour it is possible that they will cause considerable reversion among the later youngsters until it is possible that fewer will change colour each year. If they do not change colour by the third year they should be removed from the pond.

I bought some small snails and some of them have died. What is the reason?

Many of these fancy goldfish are imported from the Far East. They are often smuggled out of China and find their way here via Singapore. They are sometimes bred at rather high temperatures and may have a long and trying journey before they reach this country. They are therefore rather difficult to get acclimatised here and only a good dealer would be able to get them all over the shortage of food and change of conditions. Very many of such fishes die when they come into the hands of aquarists who have little experience with this problem.

I have noticed that some of my fishes have a small wire-like thing protruding from the body. It seems to have a "V" shaped tail. What is it?

The pest appears to be an anchorworm (Lernae). These can swim freely to find a host and then they become attached to a fish and burrow under a scale. They are very difficult to clear from fishes in the pond as anything strong enough to kill them would also kill the fishes. The best way is to catch the fish and dash the worm with Dettol or Milton on a piece of cotton wool. You may have to repeat the treatment.

I have decided to start keeping coldwater fishes after some years with tropicals. I would like to know where I can get supplies, such as water plants and fish?

If you look through *The Aquarist* each month you will find plenty of dealers advertising the requirements for your purpose.

I have a light in my pond and this is fed by a copper covered cable. Is this small amount of copper dangerous to the fishes?

Copper in any form can be very dangerous to fishes. A lot depends on the water as the softer it is the more dangerous as a lime-type water would soon cover the cable and lessen the danger. Some fishes are killed by a fifth part of copper to a million parts of water. I have had very many instances of fishes being killed reported to me over the years and copper has been the main cause every time.

For the beginner: Food for Tropical Fish

by B. A. WHITESIDE

WHAT sort of food will I use to feed my tropical fish? This question is often asked by the new tropical-fish keeper or aquarist, as he is technically known. There is no short answer to the question as fish, like human beings, thrive on a variety of foods.

Fish, unlike most other pets, are not very easy to take to the vet if they become unwell. This is especially so with tropical fish whose water has to be maintained at about 75 degrees Fahrenheit. The best policy is to keep your fish in good health so that they do not become ill and this can be aided by feeding them on the correct foods.

Commonest of all foods are the dried ones sold in cartons and these may be in the form of flakes, small pellets or granules or in powdered form. Powdered foods may come in three grades, fine, medium and coarse. They may contain a mixture of substances such as cereals, dried liver or fish meal, dried *Daphnia* (water fleas as they are commonly called), dried shrimp, meal and many other substances. Ants' "eggs" are of little value as a food for tropical fish as they are too large to be swallowed but they are sometimes used for playing "games" by larger fish which pull them down into the water and allow them to float to the surface again, after which the process is repeated.

Dried foods for a specific purpose are also available and may contain a high proportion of vegetable matter for fish such as mollies; contain substances which help to brighten the colours of fish; or be specially formulated to supply a staple diet for fish such as guppies. Cartons of food are also available to encourage rapid growth of young fish. Fry, as young fish are called, need food in the form of small particles.

The food depends upon the size of the fry. These can be very small if they are hatched from an egg or slightly larger if they are born alive as is the case with the live-bearers—such fish as mollies, guppies or swordtails.

For egg-hatched fry the first food can be infusoria.

These are minute creatures which can be obtained by boiling some hay in water and allowing it to stand for a few days. The resulting liquid is siphoned into the fry tank in small quantities at regular intervals. A jar or two should be prepared before the fry hatch so that the infusoria are ready and a new jar started each day until the fry are big enough to move on to larger foods. From aquatic dealers one can obtain a number of first foods for fry. One firm supplies tubes of food for baby fish.

Two types of tubed food are available, one for egg hatched and one for live-born fry. These are useful in that they contain not only food which is immediately available to the young fish, but also substances which produce infusoria in a very short time. This saves the bother of having to boil hay etc.

Following on from first foods young fish can be fed on dried plankton which can be purchased, or on small quantities of the yolk of an egg which has been hard boiled and is swished through the water in small quantities to release a cloud of small particles. In all cases fry should not be overfed as excess food can quickly foul the water and produce diseases which can quickly kill off a batch of young fish. As the fish grow they can be moved on to dried foods sifted through a nylon stocking to remove the larger grains.

If you want to produce large healthy tropical fish then you must include some live food in their diet. Live foods for young fish after the infusoria stage can be brine shrimps or microworms. Large fish thrive on Grindal worms or white worms.

These live foods can easily be raised at home by the fish-keeper who wants to give his fish the best. Brine shrimps are hatched from dried eggs which can be kept for a number of years in sealed containers—rather like seeds. To activate the dried eggs they are placed in brine solution made by dissolving about four tablespoons of salt in a pint of warm water. Use cooking salt for this and not table salt as the latter will probably contain other chemicals added to keep the salt free flowing.

Place the brine in a flat dish, such as a pie-dish, scatter a pinch of eggs on the surface, and keep in a warm place such as a kitchen. In two or three days the eggs should have hatched and the shrimps should be siphoned through an old nylon stocking to remove the shells of the eggs and any crystals of salt. As with infusoria, a new batch should be raised every few days to ensure a continuous supply.

Microworms are minute worms raised in oatmeal porridge in a shallow pie-dish kept in a warm place. The initial culture of worms can be bought for about half-a-crown, and a piece of balsa wood floating on the surface is soon covered with worms. These can be washed into the fry tank in small quantities. As the old culture soon begins to smell, a new one can be started every week or so, and the old one discarded.

Larger worms, called Grindal worms, are raised in small wooden boxes of damp soil kept at about 65° Fahrenheit. A culture of worms is placed in the centre of the soil in a slight depression, and can be fed on small spoonfuls of cooked porridge. A small sheet of glass placed on the soil is soon covered with worms which can be scraped off into the young fishes' tank.

White worms are about half an inch long and are raised similarly to Grindal worms except that the soil is kept drier and should contain some peat and sand to give a porous texture. Boxes should be kept in a dark place such



"Water fleas" (*Daphnia*) highly magnified. The ideal live fish food

The Egyptian Mouthbreeder

by M. R. FITZGERALD

THE Egyptian mouthbreeder, *Haplochromis mudricolor*, is an easy fish to spawn and keep. Growing to little more than 2½ inches in length, it is one of the smallest cichlids, but certainly one of the most interesting. It will live happily on most flaked dried foods, but it should be borne in mind that its mouth is big enough for large live foods of which it likes to have plenty. Larger specimens sometimes take a nip at gourami feelers or very small fish.

Even its fondest admirers would not describe it as one of the most handsome of the family, but its habits and apparent begging for food when it sees its owner, soon make the mouthbreeder a well-loved pet. With its long dorsal crest and extended anal fin it is quite typical of the dwarf cichlids, its body shape closely resembling *Aptis-*

granus ornaticornis. The male is spangled with blue-green flecks which are concentrated on his unpaired fins. He has an orange spot on his anal fin, and a pink suffusion covers the stomach of good specimens. The female, however, is a drab brown-grey all over and her body appears to be quite out of proportion for her head and jaw are greatly enlarged for the breeding habits that make this fish so well known.

Before attempting breeding, the female should be well conditioned on such foods as Tubifex until she is really bulging with roe for if she does not respond to the male's attentions, he will ill-treat her badly.

The pair should be introduced to the breeding tank in the afternoon and given plenty of light. The water should be about 80°F. with a pH of 7.2. The tank should be densely planted at one end to provide refuge for the female, and the floor covered thickly with gravel. All being well, the male will immediately display with all fins spread and his colours at their best—a black colour coming into his ventrals and dorsal. He scoops several pits in the gravel (so any plants should not be of a type that resents uprooting), and tries to entice the female to spawn in one. His courtship may last some days and if the female is reluctant, results can sometimes be had by (a) feeding her very heavily (this seems to act as a trigger), and (b) by covering the front glass to stop any disturbance. Eventually they spawn in one of the depressions and the female will then gather the eggs (20-40) up into her mouth. The male is now best removed and the lighting dimmed. The female's mouth is now greatly distended and where the skin is stretched tightly the eyes of the babies can be seen and unless she is frightened into swallowing them, she will release the babies after about 10-14 days.

They are about the size of new-born guppies and can immediately take a dust-fine dried food though of course better results are obtained with microworms, brine shrimp, etc. In a month they will be ½ inch long, and will mature at four months, depending on temperature and food.



Egyptian mouthbreeder, lower fish is the female

THE symptoms of scale protrusion are similar to those of dropsy but there is less swelling present. The most important and discriminating symptom is the presence of small red spots that may be found on the body or fins which indicates an infection by the micro-organisms responsible for scale protrusion. This disease can be contagious.

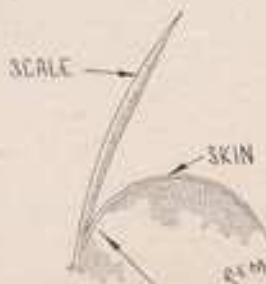
The protruding scales will become very loose and may be rubbed from the fish quite easily. The fins may also appear ragged. In the advanced stages of this disease the movements of the fish become slower and the breathing frequency increases. The fish will float near the surface of the water and before long a form of paralysis will affect the tail. As the infection progresses the number of red spots will increase and become more obvious. When this stage is reached death will occur within a few days.

Once the disease is in an advanced stage the affected fish should be destroyed and the tank disinfected with a 1 per cent solution of chlorine. Treatment can be tried by using a 1 per cent solution of phenomethol as a stock solution. 45 cu. cm. of this stock solution are added for every Imperial gallon of water in the tank. Sulphanilamide and chloramphenicol may be useful as a treatment but sulpha drugs and antibiotics cannot be sold to laymen without an authorized prescription.

Fish Diseases (No. 23)

Scale Protusion

by R. E. MACDONALD



Watery exudate forcing scale outwards from beneath skin

Misgurnus Fossilis

by JACK HEMS

THIS bottom-dweller, a loach from central and eastern Europe, is commonly referred to as the weatherfish or thunderfish. It is called by these names because it is sensitive to changes in atmospheric pressure, and before or during a storm sometimes, (but not always) shows signs of great unrest. During really oppressive weather, which may result in rapid depletion of the oxygen content of a small body of still water, this restlessness is usually accompanied by frequent dashes to the surface for a gulp of air for the fish has the capacity to use its intestine as a supplementary breathing organ. Another useful characteristic it has is the ability to adapt itself to a wide range of temperature. Naturally, the change from cold water to warm water must be brought about very gradually. Also, young fish are easier to acclimatise to a tropical temperature than old fish.

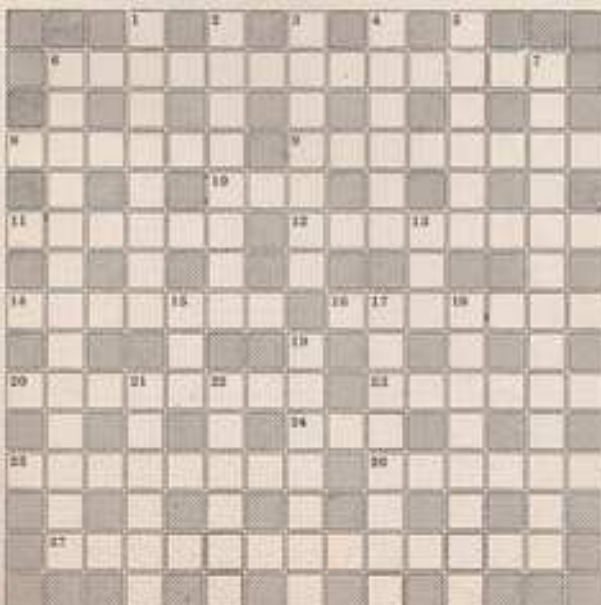
In the wild state *M. fossilis* may exceed 12 in. in length against an average of 10 in. in captivity. The elongated body, rounded anteriorly and rather compressed posteriorly, is dark brown on the back and yellowish to clay-coloured on the sides and belly. Three or more dark brown to blackish horizontal stripes extend from the head to the tail. The spaces between these stripes are ordinarily sprinkled with a myriad of dark blotches and spots. The fins are more or less rounded. Ten conspicuous barbels are present on the

mouth; three pairs on the upper jaw, two pairs on the lower jaw. The black eyes are rimmed with gold. In mature fish the sexes may be distinguished by the fact that the pectoral fins of the female are smaller and rounder in outline than those of the male.

Records of *M. fossilis* breeding in the aquarium are few and far between, but we do know from the writings of reliable authorities that when this fish does decide to raise a family late spring or early summer is the preferred time, and a large female may deposit up to 150,000 adhesive eggs. The eggs, which are laid on vegetation growing at or near the bottom, take nearly a fortnight to incubate and the newly hatched fry waste no time in making themselves scarce in dark corners or among drifts of sediment. Therefore their care presents few problems because, like their parents, they will gobble up almost anything fleshy or farinaceous provided it is small enough to be swallowed.

As the weatherfish leaves other fishes in peace, and is a good scavenger, specimens up to about 4 in. long make highly interesting and satisfactory occupants of a decorative coldwater or tropical community tank. Beyond that size, however, they are best kept on their own in a roomy tank furnished with lead-weighted bunches of inexpensive plants and a deep sandy bed in which they can tunnel and forage to their heart's content.

The AQUARIST Crossword Compiled by L. BRADLEY



CLUES ACROSS

- An ice rain cure (cong.) written in Latin (7, 6).
- To do a favour (6).
- Barba Conchona (4, 4).
- A Member of Parliament, currently speaking (7).
- Diskeeper (6).
- Bummes cloudy (6).
- Tories + I (cong.) (7).
- Heron that sounds like a small eelbird (7).
- Liberty (6).
- Vast regions of land (6).
- Drink for golfers (4).
- Esoteric Marine (6).
- Glass (6).
- See 21 down.

CLUES DOWN

- Reserved (6).
- White spots, for rot and fungus are examples (6).
- Ladies' answer to unassailable locks (7).
- Sharden, the oase (6).
- To authorize (6).
- Red-headed glass-fish (6, 7).
- Enthusiastic aquarium holdlers (7, 6).
- Quiet and French favourite (5).
- Business of Naval Architects (7).
- Type of thermometer used inside aquariums (6).
- Fishing nets (6).
- Describes one of the colours of a goldfish (Aquarist, Nov. 66) (7).
- 21 and 27 Across. Genus of swamp plant belonging to the Scrophulariaceae family and found in Southern and Central U.S.A. (6, 17).
- Standard carried by Columbus Ferrer (6).

Solution on page 226



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

THE New Forest A.S. held their first meeting of the new year recently. Sixteen members were present and it was pleasing to see four prospective members visiting the club. Among items discussed was that after being formed eight years ago the society was now to make application for membership to the F.R.A.S. Results of the table show were as follows: Labyrinth, 1, Mr. Williamson (best guppies); 2, Mr. Judd (blue three spot); 3, Mr. Williamson (best female); A.V. dunnies, 1, Mr. Hare (best); 2, Mr. Harding (great dunnies); 3, Mr. Harding (best).

DUE to bad weather conditions the **Llanwit Major A.S.** did not hold a meeting in January. Mr. Sanders presided at the February meeting and it was decided to hold the annual show on Saturday, 11th June, in the Llanwit Major Town Hall. During the evening, slides on the characters were shown, with a taped lecture, given by Mr. Johns. Meetings are held on the second Tuesday, 7.30 p.m. in the Lesser Hall, Llanwit Major.

AT the annual general meeting of the **Harlow A.S.** the following officers were elected:—Chairman, Mr. J. N. Soates, B.Sc.; vice-chairman, Mr. R. Oliver; secretary, Mr. J. B. Duncan, 28 Long House, Bush Fair, Harlow, Essex; treasurer, Mrs. V. Duncan; show secretary, Mr. R. Kerridge; auditor, Mr. J. Shaw. Committee: Mr. J. Morry, Mr. H. Hall, F.R.M.S., Mr. J. Coleman, Mr. R. Martin; reserve committee member, P. Wheeler.

The main events of the evening were the presentations of the trophies.—Table show trophy and cup to J. Mr. J. H. Soates, silver medal, 2, Mr. R. Kerridge, bronze medal, 3, Mr. R. Oliver. Home furnished aquaria cup, Mr. H. Hall. The society's first magazine was distributed to members and a number of copies have been sent to other societies. Any club or society wishing to have a copy please write to the Secretary, Mr. J. Duncan, 28 Long House, Bush Fair, Harlow.

THE Portsmouth A.S.'s annual general meeting was held in February, when the following were elected to serve for the coming year—Chairman, Mr. E. Warren; secretary, Mr. J. Stillwell; treasurer, Mr. H. Mason; show secretary, Mr. W. Ryder. Committee: Messrs. Stillwell, Ryder and Howard; Messrs. Hunt, Howard, Evans, Form and Franklin.

Table show trophies were won by the following members:—Highest points trophy, Mr. E. Warren; Edmonson challenge shield for showman, Mr. J. Stillwell; annual retained shield, Mrs. J. Stillwell; Taylor shield for labyrinth, Mr. E. Warren; Betty memorial trophy for plants, Mrs. J. Stillwell; P. W. Ryder cup (highest points, better cold-water), B. Ayling; D. Forse cup (breeder's tropical or coldwater), Mr. N. Franklin; home furnished aquaria trophy, Mr. M. Mason. The dates for the open show were confirmed as fish breeding, 6th August (judging, 7th August), open to public, 8th to 13th August inclusive. The address of the secretary is now Mr. J. Stillwell, 24 Salcombe Avenue, Copnor, Portsmouth, Hants.

The February meeting of the **Corby and District A.S.** was their annual social evening. Two table shows were introduced into the programme, one for the senior members and for youth and that for juniors, are victory trophies. In the youth competition members gave their ideas as to the placing of the exhibits and Mrs. Barrell analysed the opinions to make the awards which were—1, Mr. R. Still; 2, Mr. T. Kelly; 3, Miss Bell. The junior winners were: 1, M. Phamam; 2, A. Brooks; 3, G. McPhee; were also placed by Mrs. Barrell. Mr. D. Jones was M.C. for the social part of the evening's programme.

THE results of the home aquaria competition of the **Bradford and District A.S.** was as follows:—1, Mrs. D. Fletcher (98.5 pts.); 2, Mr. R. P. Russell (84.5 pts.); 3, Mr. J. D. Hatford (84.5 pts.); 4, Mrs. M. Verb (80.5 pts.); 5, Mr. R. Whitcomb (79.5 pts.); 6, Mr. W. L. Haley (77.5 pts.). The new president for 1966 is Mr. G. Holmes.

THE Hull A.S. meetings are held on the first and third Wednesday each month, at the Railway Institute, Ashby Road. At the last meeting the chairman, Mr. Chapman, spoke to the meeting on the subject of fishkeeping and building of fish rooms, stressing the essential point that one does not have to have an unlimited number of tanks to be good fishkeepers. Make use of roomers to build in two or three tanks, but keep only the number of tanks that the pocket and time can afford. A slide lecture in life foods was held on the 16th February. Visitors can always be assured of a warm welcome.

A LECTURE was given at the February meeting of the **Wakenfield and District A.S.** on furnished aquaria by Mr. I. M. Skinner who also judged the A.O.V. table show, the results of which were—1, Mr. A. Cotton; 2, Mr. D. English; 3, Mr. G. Beady.

A CHANGE of secretary is reported from **Dunbury and District A.S.** The new official is Mr. D. Dunford, 5 Foxford Lane, Thornhill, Dunbury, York.

THE Thurrock A.S. has been quite active recently with a very good quiz submitted by B. Taskard and R. Bacon which was enjoyed by all. Then there was a table show for guppies the results of which were as follows:—Females: 1, Mr. P. O'Brien; 2, Mr. R. Soames; 3, Mr. B. Barber. Males: 1, Mr. I. Sawyer; 2, Mr. P. Hensley; 3, Mr. R. Soames. The shield of the month award competition was won by Mr. P. O'Brien's female guppies.

The other two meetings were taken up by a talk by Mr. E. Nield on the subject of "General Fishes" and the final competition for the month which was for a table show for A.O.V. members judged by the show secretary, Mr. D. Durrant, and publicite officer, Mr. E. Nield. There were 34 entries and the following three classes were judged, viz: Mollies, swordtails. The results were as follows:—Fishes: 1 and 3, Mr. P. Hensley; 2, Mr. S. Hendle; Mollies: 1, Mr. R. Soames; 2, Mr. B. Taskard; 3 (group), Mr. R. Soames and Mr. B. Barber; Swords: 1, Miss G. Rowe (best fish in show,

17 entries); 2, Mr. G. Perkins; 3, Mr. K. Appleyard. Miss G. Rowe now holds the shield until the next table show in a month's time and the aquarist who holds the shield most times during the year automatically keeps the trophy.

THE weather conditions kept many members of the **Accrington A.S.** at home by the seaside, only 10 coming to the monthly meeting. Mr. Whitney gave a lecture on the care and breeding of *Aplocheilichthys*. Then followed a "Bring and Buy Sale" in aid of society funds which resulted in a profit of £1.48 for the society. Mr. Whitney and Mr. Chadwick shared the table show awards, each having casts for 1st, 2nd and 3rd places.

AT a January meeting of the **Cardiff A.S.** the show judge and speaker was Mr. R. D. Johns from Barry. The results were as follows:—Breeds: 1, Mr. C. W. Gorwill; 2, Mr. C. W. Gorwill; 3, Mr. P. Barnta; 4, Mr. P. Barnta. At the February meeting the table show was judged by Mr. M. J. Parry of Newport A.S. The results were as follows:—Goldfish: 1, P. Harris; 2, N. Connell; 3, C. Gorwill; 4, N. Connell. Labyrinth: 1, Mr. P. Barnta; 2, Mr. P. Barnta; 3, Mr. C. Gorwill. Two new members were present at this meeting, Mr. G. Williams and Mr. M. Jones.

The society has recently announced that its open show this year will be held in Central Cardiff (hall to be fixed) on the 21st May. It is hoped to stage the largest show ever held in Wales and every farmer and father information can be obtained from the home show secretary, Mr. N. J. Connell, 29 Lissonvale Road, Gallellia, Cardiff.

Meetings are held on the second and third Thursdays of each month at the Old Arcade in Church Street, Cardiff, at 8 p.m. Members, wives and visitors can be assured a warm welcome.

THE February meeting of the **Warrington A.S.** was held as usual on the second Tuesday of the month at the King O' Balls near the Parish Church, the fish of the month being the Siamese fighting fish. After the chairman, Mr. Pete Norris, had opened the meeting he was ably assisted by secretary, Jim Hargrave, in a discussion about ways of increasing the scope of the branch. Mrs. J. Cameron gave a talk about the problems she has encountered in breeding egglayers, notably fighters. Everyone seemed only too willing to pool their experiences and the resulting discussion will probably help to improve members prospects of successful breeding.

A table show of fighters was held which resulted in Mr. M. Nadine capturing two of the first three places with Mr. A. Cameron gaining a second place to prevent a monopoly. The experienced veteran aquarist, Mr. Alf Hargrave, kindly looked after the judging. Then followed the usual section of fish plants and other items and the monthly raffle was held to complete the normal programme of the meeting. There were about thirty members present, despite torrential rain, and a freely discussion about various aspects of fish keeping continued until time was ultimately called. The next meeting, which will be the annual general meeting, will take place at the same venue on Tuesday, 6th March, commencing at 8.15 p.m. A lively evening is anticipated and newcomers will be made welcome.

THE main event of the January meeting of the **Heald and District Aquarists' and Pond-keepers' Society** was the distribution by the president of the society, Mr. V. Price, of yearbook awards by members during 1965. On display were awards obtained by members in open competitions, the majority of which were won by Mr. H. Budge with his entries of coldwater fish in shows in London and the Home Counties.

Details of the society's 1965 results are as follows:—Pond competition: 1, Mr. H. Budge; 2, Mr. M. Brill; 3rd, Mr. Braden and Mr. Cook. Home aquarist competition: 1, Mr. H. Budge; 2, Mr. M. Brill; 3, Mr. Hargrave. All classes table show—best egglayer: Mr. Cook, goldfish (bordered); best freshwater: Mr. Banton, red swordtail; best senior entry: Mr. Banton,

son, notwithstanding. The show secretary, Mr. Berger, reviewed the reports shown held in 1965 and projected the programme for 1966 and discussion took place on the part the society will play in the Redbridge Arts Council's "Arts and Crafts Exhibitions" to be held in Ilford during April.

Anyone interested in following will be welcome at future meetings to be held on the second Monday evening of each month at the above hall.

Further details of the society, now a member of the Redbridge Arts Council, can be obtained from the secretary, Mr. R. Ruth, 13 Dunsford Road, Dag Hammarskjöld.

AT the recent annual general meeting of the Southampton and District A.S., the reports of the committee and treasurer were adopted. The members were in favour of more club activities, trips, informal meetings at members' homes and if possible a show during the year. Mr. L. Hastings was elected chairman and Mr. D. Jones hon. show secretary. Mrs. Gilbert and Mr. Spradlin were re-elected hon. secretary and hon. treasurer respectively. Mr. H. J. Gilbert is librarian and minute secretary. The committee members are Mr. Kendall, Mr. H. Gilbert and Mrs. Jones.

Trophies for the 1965 competitions were presented as follows:—The tropical plants (table show) cup; J. Mr. Jones; 2, Miss V. Gilbert; 3, Mr. Fish. The outdoor plants (table show) cup; 1, Mr. Ryder; 2, Mr. Fish; 3, Miss V. Gilbert. The pond competition cup; 1, Mr. Fish; 2, Mr. and Mrs. Gilbert; 3, Mr. Macklin. The home furnished aquaria competition; 1, Mrs. Gilbert; 2, Mr. H. Gilbert; 3, Mr. Hastings.

THE following officers were elected at the annual general meeting of the East London Aquarists and Pondkeepers Association:—President, Mr. P. S. Cawston; vice-presidents, Mr. C. W. G. Croft, F.R.H.S., Mr. R. A. Taylor and Mr. P. Arnold; chairman, Mr. R. Dodder; vice-chairman, Mr. P. Vicker; hon. secretary, Mr. R. Emery; treasurer, Mr. A. Harris; show secretary, Mrs. A. P. Harris. The annual dinner and dance which was held in January was a great success. The society meets on the first and third Friday in each month at The Ripple School, Ripple Road, Barkingside.

Further details are available from the hon. secretary, Mr. R. Emery, 44 St. Eversfield Road, Barkingside, Essex.

THE Dag Hammarskjöld Town Show will be held this year on the 9th and 10th July and schedules will be available shortly from Mr. J. Pynn, 3 Ashwell Drive, Chesham, Essex.

THE officials appointed at the annual general meeting of the Urmsdon A.S. were as follows:—Chairman, Mr. B. Ogden; secretary, Mr. G. A. Collins; treasurer, Mr. S. Whitaker; auditors, Mr. Oakley and Miss A. S. Newland. Any prospective members who are interested in the club's activities please contact the club secretary at 23 Guildford Road, Dorychester, Urmsdon, Lancs.

AN encouraging report of progress was presented by the secretary, Mr. A. E. Adams, at the annual general meeting of the Midland Association of Aquarists Societies.

During the past year the association membership had increased by the addition of five more Midland societies, three being from Stone (Staffs.), Dudley, Lockwood (Leamington), Derby Hagart and Walsall, and this brought the association membership up to 23 societies. The increased membership had meant a comparative extension of the work of the services secretary but Mr. D. Johnson, who had taken over the position during the middle of the association year, reported no major problems.

The next date of general importance to the association is the 9th May when the annual convention will be held in Birmingham. At the election of officers and committee the principal officers of last year were re-elected with one or

two changes in committee membership. The general secretary is Mr. A. E. Adams, 59 Colby Road, Hill Green, Birmingham, 28. The services secretary (judges, speakers, etc.) is Mr. D. Johnson, 6 Fairbourne Avenue, Whimbleth, Blackthorn, Staffs.

IN January the Nottingham and District A.S. changed the venue of their monthly meetings to the Pincock Hotel, Mansfield Road, Nottingham. This month's special feature was a film show on underwater swimming and a photographer's holiday in Africa. The table show resulted as follows:—Guppies: 1, J. Newman; 2, C. Hill. Barbosus: 1 and 2, H. Riley; 3, G. Haldyment. Kaffir: first prize was won by Mr. Christian and the second prize by Mr. Rana. The third prize went to Mrs. Goodfellow.

THE Wilham and District A.S. held its annual general meeting recently. The officers elected for 1966 were:—Chairman, D. Maltin; vice-chairman, R. Chicks; treasurer, W. Fox; secretary, D. Wilton, 25 Almond Road, Wilham. Committee: D. Walls, R. Nott and C. Gage.

A plaque was presented to Mr. C. Gage for winning the home aquaria competition and a shield and medal were presented to Mr. D. Walls for having the highest aggregate points over the year in the monthly table shows.

AT the annual general meeting of the Blackpool and Fylde A.S. the following committee were elected to serve during 1966:—President, Mr. C. Cross; vice-presidents, Mr. V. Fletcher, Mr. G. N. Hadley and Mr. J. Ebbington; chairman, Mr. W. K. Pearson; vice-chairman, Mr. E. R. Stronach; secretary, Mr. R. Lister; treasurer, Mr. J. Hayes; technical adviser, Mr. G. Bennett. Executive committee: Mr. E. Crowther, Mr. B. Lister, Mr. J. Cross, Mr. B. E. Stronach, Mr. J. E. Taylor, Mr. F. C. Willmott. Show committee: Mr. J. Cross, Mr. F. Crowther, Mr. C. A. Jones, Mr. B. Lister, Mr. A. Mather, Mr. R. H. Simpson, Mr. J. Smith, Mr. J. E. Taylor, Mr. F. C. Willmott. The club meets every second and fourth Wednesday of each month at the Verney Arms Hotel on Cookson Street, Blackpool, at 7.30 p.m. Incoming members will be welcomed at meetings and further information can be obtained from the secretary, Mr. L. G. Howard, 55 Stanford Avenue, Blackpool.

THE newly-formed Mosey A.S. held its very first open table show recently and it was a very great success. It was well attended by both the non-fishkeeping public and interested people who were seeing a table show for the very first time, and five new members were enrolled.

The results were as follows:—Livestones: 1 and 2, G. Suet; 3, R. Anderson. Egglovers and A.O.V.: 1, P. Mellis; 2, R. Anderson; 3, R. Searant.

Anyone interested in fishkeeping and aquatic life will be most welcome at future meetings held every fortnight. Further details are available from the secretary, Mr. T. Burke, 1 Hamlet Way, Kintola, Furness, Morecambe.

AT the annual general meeting of the Manchester section of the Fancy Guppy Association the chairman, treasurer, F.R.C. and assistant secretary were re-elected for a further two years. The accounts and balance sheet showed the association to be in a very strong position and were passed unanimously. The remainder of the meeting was taken up by a table show and lecture given by Mr. J. Kelly on the guppy personalities he had met in America. A table show was held and a gold medal awarded to the winner of best in show. Anyone interested in guppies, would they please contact Mr. B. Beresford, 99 Valley Road, Ardlen Park, Redbury, Cheshire (association secretary), who will be pleased to supply all details and put those interested in touch with the nearest section.

AT the recent annual general meeting of the Chappeltown and District A.S. the following officers and committee were elected:—Chairman, Mr. S. Barnshorn; vice-chairman, Mr. A. Hirst; treasurer, Mr. L. Stinson; show

secretary, Mr. E. Fearnough. Committee: Mr. A. Ashy, Mr. L. Wray, Mr. B. Mitchell, Mr. L. Worthington, Mr. D. Sides, Mr. W. Wiggins and junior delegate, Mr. F. Adams. At the January meeting a licence by Mr. J. Collings on aquarium plants was very much enjoyed by all members, and Mr. Collings was persuaded to return again at a later date. The winners of the table show were:—Livestones: 1, Mrs. D. Fearnough; 2, Mr. F. Adams; 3, Mr. R. Crofts. Guppies: 1, Mr. E. Fearnough; 2, Mr. D. Sides; 3, Mrs. A. Hirst.

Anyone interested in fishkeeping and who would like to join the society should contact the secretary, Mr. R. Crofts, 42 Burrows Road, Chappeltown, or ring Ecclefield 3755 for further details.

THE table show result of the Gloucester and Cheltenham A.S. for A.O.V. trophies was as follows:—1, Mr. Fairhurst; 2, Mr. Hayden; 3, Mr. James. An interesting talk was given by Mr. C. Cornish on marine invertebrates. The secretary is Mr. V. C. Howes, 19 Diana Road, Cheltenham.

AT the annual general meeting of The Middleborough and District A.S. the following officers were elected:—Chairman, Mr. G. Pender; secretary, Mr. J. B. Adams; treasurer, Mr. J. Paine; show secretary, Mr. M. Brist. The club annual open show will be held at the Strick Hill Community Centre on the 17th April. A buffet lunch will be available from 1 p.m. to 2.30 p.m. Meetings are to be held fortnightly on Wednesdays at the Black Lion Hotel, North Ormsby, and a cordial invitation is extended to all persons wishing to join an active and friendly society.

The Uxbridge and District A.S.'s annual general meeting was held recently and 200 members attended. In his address the chairman stated that the club had had a successful year and that membership had increased, the number of members now being 500. He thanked all members for supporting the club especially in making the open show such a success. Throughout the year a number of table shows were held, also a number of lectures, and these activities were followed enthusiastically. Similar events are planned for this year. Principal prize winners over the year were Mr. Baker, Mr. Brunton, Mr. Peters and the treasurer, Mr. Peters, agreed to stay in office, the two moon showings being Mr. C. Bull taking over as secretary from Mr. Baker, who now becomes assistant secretary, and Mr. Gage succeeding Mr. Pender as show secretary. Mr. Pender to be assistant show secretary. The addresses of the principal officials are as follows:—Chairman, Mr. H. Moore, 65 Heath Road, Uxbridge, Middlesex; secretary, Mr. C. Bull, 70 Hatherleigh Road, Bushey, Middlesex; show secretary, Mr. F. Gage, 3 Clonally Avenue, Uxbridge, Middlesex; treasurer, Mr. J. Peters, 107 Shenley Avenue, Bushey, Middlesex.

THE annual general meeting of the Salisbury and District A.S. was held early in February and the following officers were elected:—Chairman, J. West; vice-chairman, R. Hayden; treasurer, D. Brown; show secretary, A. Coomber; secretary, I. Goddard. New members would be warmly welcomed and all enquiries should be made to the Secretary, Mr. I. Goddard, 98 Fisherton Street, Salisbury.

AT a meeting of the Valley A.S. Mr. W. Lawton gave an interesting and explanatory talk on furnishing an aquarium. He also showed members how to make an effective background out of a piece of hardboard and plaster, then painting it with greys and browns to make a cave-like appearance at the back.

Mr. T. Hardman judged the table show for guppies, and afterwards explained to the members the faults with each fish. Table show credits:—Female guppies: 1, Mr. M. Goodchild; 2, Mr. K. Sparling. Male guppies: 1, Mr. P. Lilley; 2, Mr. K. Sparling; 3, Mr. G. Isherwood.

The meetings are held at the Minster Arms, Barmston, and further information can be obtained by applying to the secretary, Mrs. J. M. Ingham, 4 Daley Street, Southold, Bury, Lancs.

IN the Association of South London Aquarist Society's knock-out competition the final was held on the 26th January and was won by **Housslow A.S.** with 1561 points in the Catford A.S. tank of 229 gallons. The first four places were as follows—1, Mr. Sheppard (Housslow A.S.); 2, Mr. Pratt (Housslow A.S.); 3, Mr. Thomas (Housslow A.S.); 4, Mr. Gobben (Catford A.S.).

In a recent table show held by the Housslow and District A.S. for fish of any other variety this was won by Mr. Morris and his staff (74 points); 2, Mr. Thomas's assistant (73 points); 3, Miss Chandler's *iodanilla barbata* (72 points). The show was judged by Mr. H. Towell. The meetings of the Housslow society are now held fortnightly at the Territorial Army Centre, Haworth Road, Hounslow, and the secretary is Mr. D. J. Woodward, 19 Elizabeth Road, Hounslow, Middlesex.

THE Catford A.S. open show, 1966, will be held on Saturday, 4th June. Full details can be obtained from the show secretary, Catford A.S., Mr. K. D. Owen, 42 Elmer Road, Catford, London, S.E.6.

THE **Baggate and Redhill Tropical Fish Association** held their annual general meeting at Baggate in early January. The chairman in his report gave a most satisfactory account of the club's first year's progress. The original membership has grown from six to 24, and there were a further half dozen prospective members present at the meeting.

It has been decided to alter the club's title to the **Baggate and Redhill Aquarist Society** as the original concept has been reinforced by several collector specimens and pondkeepers. The officers elected were:—Chairman, Mr. A. Barker (re-elected); vice-chairman, Mr. W. Lush; secretary, Mrs. E. Packman (re-elected); treasurer, Mr. W. Brookfield; show secretary, Mr. G. Barr; committee member, Mr. D. Colver. The show secretary's address is 2 Cavendish House, Rose Road, Redhill, Surrey.

THE newly-formed **Eastbourne A.S.** held their meetings at The Crown, Old Town, Eastbourne, and anybody who is interested to contact the secretary, Mr. Colin George, 6 Hare Road, Eastbourne, Sussex.

AT the recently held third annual general meeting of the **Rowtree A.S.**, the chairman congratulated the members on the completion of a most successful year and presented an rrrrr more successful 1966. He presented trophies to the winning members. Pondkeeper of the year: 1, Mr. T. Adlam (27 points); 2, Mr. R. F. Saiter (14 points). Breeders' class: 1, Mr. R. P. Saiter (15 points); 2, Mr. T. Adlam (14 points). Junior novice class: 1, Master H. McMillan (25 points); 2, Master T. Saiter (10 points). Pota show, team competition: "A" team, 111 points; "B" team, 97 points.

The following members were elected as officers:—Chairman, Mr. I. L. Millington; vice-chairman, Mr. E. Saiter; secretary, Mr. T. Adlam; committee members, Mr. R. F. Saiter, Mr. H. McMillan, Mr. H. McMillan, Hon. auditors, Mr. M. Sizer and Mr. R. F. Saiter.

The meeting was held early in February, when a talk was given on "Principles of Breeding, Dev's and Dev's". A second talk was on "Breeding Norman Fishes". The speakers were Mr. T. Adlam and R. Derris.

COMMENCING the 16th February the meetings of the **Wotton A.S.** will be held at Park Street Centre for Further Education. This move will give the society better facilities for fish, speakers, etc., to make more interesting meetings. Anyone interested will be wel-

comed. The meetings are at 7 p.m. on the second Thursday of each month and the secretary is Mr. G. Berry, 82 St. Helen's Street, Ilfracombe, W. Somerset.

THE third annual general meeting of the **Loyne Aquarists** was held in January when the results of the competition were announced and officers elected for this year. The winner of the Best all-rounder competition was Mr. J. Goodger; second being Mr. J. Wills; and third, Mr. F. Aveyard. The better aquarist competition was won by Mr. G. Oxtoby, second being Mr. J. Whitaker and third Mr. S. Barker. The best fish of the year show was won by Mr. J. Wills; Mr. G. Oxtoby taking second and third. The officers elected for the year were as follows:—President, Mrs. M. Smith; chairman, Mr. D. Jones; secretary, Mrs. F. Goodger; treasurer, Mr. J. Goodger; committee, Mr. J. Wills, Mr. R. Barker, Mr. E. Riley, Mr. I. Hanson and Mr. G. Oxtoby.

Suggestions were invited from members present as to the programme for the forthcoming year and a list of useful information was obtained by the committee.

AT the January meeting of the **Garforth and District A.S.**, Mr. David Linn gave a most interesting talk on furnished aquaria, with the interest in preparing a tank for showfish. This was doubly interesting as the society has just announced a competition for home furnished aquaria which will be judged on the 9th and 10th May.

It was also decided to hold the annual open show on Sunday, 16th September, at the Church Hall, Church Lane, Garforth. The results of the table show were as follows:—The Moss trophy for guppies: 1, Mrs. M. Winfield; 2, P. Clarke; 3, Mrs. M. Winfield. The Clarke trophy for catfish and loach: 1, P. Clarke; 2, Mrs. M. Winfield; 3, P. Clarke.

THERE were no changes made in the officers or committee at the annual general meeting of the **Brighton and Southern A.S.** Mr. J. Colburn remains as chairman; Mr. J. Pitham, hon. secretary; Miss P. Carr, treasurer; Mr. B. Brooking, show secretary; Mr. B. Shelton; Mr. N. Peters and Mr. P. Peery as committee members.

The chairman reported 1965 as being one of the most successful years, with membership growing apace all the time, he praised all members and the committee for their energetic and invaluable help at the annual open show, which was the highlight of the year, and looked forward to the 1966 open show which will take place on the 11th June at the Bath Hall, Hove, opposite Hove station.

At the last meeting of the society, the president, Miss Dora Bryan, presented the annual club awards to the following members:—Nichols challenge trophy for highest aggregate: Mrs. I. Ward (with 460 points); service trophy, Mr. I. J. Warriner; ladies trophy, Mrs. I. Ward; Dora Harris trophy for the best guppy: Mr. D. Lyle; furnished home aquaria class "A": Mrs. M. B. Dilly; furnished home aquaria class "B": Mrs. J. Ward. For details of meetings, please write to: Hon. Secretary, Mr. I. A. Pitham, 79 Vale Road, Portofino, Sussex.

NEW SOCIETIES

ON the 1st February the **Stockport Aquarist Club** was formed at an inaugural meeting. The officers elected for the first year were:—President, Mr. B. Woodhouse; chairman, Mr. B. Farrier; vice-chairman, Mr. C. Fernley; secretary, Mr. D. P. Johnson; minute secretary, Mr. M. Brown; treasurer, Mrs. A. Pearson. The meeting was attended by 20 local enthusiasts, apart from electing officials and outlining club policy it was decided that the club would meet on alternate Tuesdays at the Royal Oak Hotel, Edgely (opens) at 8 p.m. Further information can be obtained from the secretary, Mr. D. P. Johnson, 17 Athlone Avenue, Chesdale Hulme, Cheshire. New members will be made most welcome.

AT the present time there is no leader section of **Torbay A.S.** and it is hoped to form such a society.

Members would need to be under the age of eighteen and all interested parties should contact Mr. R. Fleisher, 115 Wiesner Street, Palmers, South Devon. This society would be an independent body and would be called the Torbay Junior A.S.

A NEW society has been formed in Hertfordshire with the title of the **Mid Herts. A.S.** Applications for membership would be welcome and further details may be obtained from the secretary, Mr. T. van Kruinern, 79 Beaumontfield Road, St. Albans, Herts.

A GROUP has recently got together and formed the **Isle of Sheppey Tropical and Cold-water Fish Society** which meets every third Monday for the benefit of club workers, at the Crown Hotel, High Street, Sheerness, at 7.45 p.m.

At present there are 13 members and the society would be glad of any help which other societies in this area can give regarding speakers. Anybody interested in joining should contact the secretary, Mr. J. Reed, 27 Southview Gardens, Sheerness, Kent.

Recently a new society was formed in S.W. London and joined the title is the **Eastpenny A.S.** The present secretary is Mr. V. R. Nixon, 4, Sowerby House, Tunworth Crescent, S.W.15 (Post 5041) and interested aquarists are invited to contact this address.

SPECIAL SUPPLEMENT

The April issue of the **Aquarist and Pondkeeper** will contain a second supplement on the garden pond and will deal with the various fishes, light and balance, friends and foes and plants. The articles will be fully illustrated with colour and black and white photographs and an early order is advised to make sure of your copy.

Crossword Solution

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64, King's Road, Reading
Telephone: Reading 53632
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Grassby, Joe., F.R.H.S.
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Marine Facilities Ltd.,
Commercial Buildings,
Custom House Quay, Falmouth
Telephone: Falmouth 88
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The Fish Bowl
Burdon Road, Sunderland
Telephone: Sunderland 71026
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Metcalf, G. R.
187, Northgate (near Minorities Garage)
(On original A.1 road) Darlington
Telephone: Darlington 9991
E.C.D. Wednesday. R. C.T.P.A.A. R.&A.

ESSEX

Goodmayes Aquaria
70 Grove Road, Chadwell Heath
Telephone: Goodmayes 2594
E.C.D. Thursday. R. C.T.P.A.A.
Skilton, C. J., Aquarist
139, Galleywood Road,
Chelmsford
Telephone: Chelmsford 56878
E.C.D. All Day Saturday. W. C.T.P.A.A.
Stan's Aquarium
466, Southchurch Road, Southend-on-Sea
Telephone: Southend 67859
E.C.D. Wednesday R. C.T.P.A.A. R.&A.

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56, Gregson Avenue, Gosport
Telephone: Fareham 4781
E.C.D. Wednesday. R. C.T.P.A.A.

Wingate Zoological Supplies

7, Market Street, Winchester
Telephone: Winchester 2406
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Kingsfisheries Aquarium
138, Croydon Road, Beckenham
Telephone: Beckenham 3716
E.C.D. Wednesday (all day). R. C.T.P.A.A.
Sherwood Pet Stores
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South Western Aquarists
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Upper Tooting, S.W.17
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Owen Reid's, Aquarium Dept.
12, Spring Bridge Road, Ealing Broadway, W.5
Telephone: Ealing 3259
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Telephone: Northampton 54610
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