

The Aquarist

and Pondkeeper

JULY 1964



MONTHLY
Vol. XXIX No. 4

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The AQUARIST AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"



VOL. XXIX No. 4

1964

THE BUTTS, HALF ACRE, BRENTFORD,
MIDDLESEX

Telephone: ISLeworth 6221

PUBLISHED MONTHLY

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Correspondence with intending contributors is welcomed.

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Recognition for Breeders

A CORRESPONDENT in this issue suggests that some form of special recognition is due to aquarists who have breeding success with some unusual or newly imported species. A good many breeders would probably agree with this in principle, although it is not an easy matter to arrange. The plan is not unlike the scheme in existence in the aviary world, where a specialist society medal may be awarded to someone breeding a particular species in captivity for the first time or producing a new hybrid bird.

Our correspondent does mention the phenomenon of "the lucky fluke", and we think it would indeed be undesirable for even a properly authenticated isolated breeding record to be eligible for an award. As Mr. L. B. Katterns points out in his article on page 59, unless an aquarist produces several generations and rears really fine adult specimens of any particular species he is not an experienced breeder. This takes time, and for everyone's satisfaction the breeder's efforts would have to be assessed at regular intervals, which is not particularly easy to arrange. It might also be thought by the breeder that his skill was being recognised rather late in this way. However, recognition can be gained and credit claimed, particularly for "first-ever" successes and even for the single success that might later prove to be of the "fluke" variety, by publication of the breeding record. Scientific discoveries are made known in this way and we hope that it is hardly necessary to remind readers that *The Aquarist* serves our particular speciality to the same end.

To return to the matter of ultimate award for a breeder's success, this could come about after the proving period, and any formal recognition of merit could be made after consideration of all the evidence he could present (or which could be presented on the behalf of any shy, retiring fish-house type), including published details of successes. Such a scheme would not preclude recognition being given to the skilled breeder who has not had the opportunity to try for a "first-ever" success but who is known to have maintained breeding stocks of consistently high-quality fishes of any species. Our guppy-breeding fraternity already do this. Would it be worth while to extend the idea?

Fungus and Fish

by A. BOARDER

IT would be reasonable to state that the commonest form of disease found to affect coldwater fishes is the one known as fungus (*Saprolegnia*). This disease can be a killer but fortunately it is not a rapidly fatal one and as long as the trouble is discovered in its fairly early stages there is every possibility of a cure. It is also a disease that can usually be recognised by most aquarists as the distinct woolly substance shows up quite plainly on a fish.

The spores of fungus are present in most waters, especially those with no flow, but a healthy fish has a protective covering of mucus which acts as a shield to prevent the disease from taking a hold on the fish. It is when this mucus is disturbed or removed that a fish is liable to be affected. It can be deduced from this that a healthy fish is not likely to be in much danger from this trouble. However, if a fish should receive any injury the damaged place can be a ready site of infection. Damage to a fish could be caused by the paw of a cat or by the fish knocking against a sharp rock. Another source of trouble is that if a fish is caught and carelessly handled some of the mucus can be removed and then the disease can get a hold. Most experienced aquarists are very careful how they use a net with fishes and I have known them to use their hands to transfer a fish rather than use a net.

If the disease appears at a spot where some damage has been caused the fungus may not spread away from that spot, and then a cure can be effected without much trouble. If the disease shows on parts of the body where there has been no apparent damage it can spread all over the fish, and when it gets near or at the gills the fish will die. No time should be lost in starting the cure once a fish is seen to be attacked. It must, of course, be isolated from all other fishes. A clean tank should be used or even a bowl will do. The treatment is to place the fish in water in every gallon of which a heaped tablespoon of sea salt has been dissolved. The container should not be left in a sunny position. After a day the water can have a little more salt added, say a teaspoonful more per gallon. This should effect a cure in 3 or 4 days. With slight attacks of fungus the fish will show an improvement in about 4 days. No food should be given whilst the fish is under treatment. When the fungus seems to have cleared the water should be changed to a weaker solution. If the old solution appears to be in good condition some fresh water can be added to it, but if it seems cloudy and smelly it should be changed. When the fish has had a day or two in the fresher water it can be returned to its usual pond or tank.

There are fungus cures on the market and these can be tried by the aquarist if the ordinary salt treatment fails to effect a cure. Sea salt can usually be obtained from a

chemist, or ordinary table salt, the block kind, can be used. Although the treated table salt can be used in emergencies it has had something added to keep it free-running, and this may not be quite as good for a cure as the other kinds.

Another trouble which sometimes affects coldwater fishes is fin-rot. This is a form of fungus and attacks the fins, especially at their ends. The tail is often affected and can be eaten almost completely away. In bad cases the dorsal fin will also be attacked. I am of the opinion that fin-rot is caused by a similar spore to fungus, as the signs are similar in the first instance. The edges of the fins alone show a white woolly fringe. After a day or two this increases in size and the ends of the fins appear to be fraying away. A fin can be eaten away completely if treatment is not given. The salt bath is again one of the best cures I know. After a few days in the solution it will be noticed that the white substance is gradually falling off and the damaged fin can soon be quite clear of the whiteness. Even if a fin has been eaten away it is possible to effect a cure and the damaged fin will soon grow again. The damage, however, usually leaves a trace, by a thickened ridge at the edge of the new growth.

Another form of fungus can attack the eyes of a fish. An opaque film will form over the eyes and the rest of the fish may not show any signs of trouble. Such a case will usually respond to the salt treatment, but in obstinate cases the eyes can be wiped carefully with a piece of cotton wool which has been dipped in a solution of equal parts of iodine and glycerine. After a day or two in the salt bath the film can be wiped away and the fish will soon recover.

Sometimes a fish will show the fungus signs at the mouth alone, and again the salt treatment will usually give a cure. In all these cases, once the fish appears to be clear of the infection it is a good plan to build it into condition again with plenty of live food. The garden worm is still the best conditioner I know and if this grand food cannot be obtained then white worms are the next best thing. It is as well to keep the fish on live foods for at least a week after it has recovered.

Remember that most troubles only affect those fishes which are in poor condition. It is only as a result of an accident that any fish kept under ideal conditions will become prey to attacks of fungus in any form. Where several fishes are affected in the same pond or container, it will be certain that the water has become impure and should be changed immediately. The tank and all contents should have a thorough cleansing and the addition of some Dettol or household ammonia to the washing water is advisable. Of course, the treated tank must be washed out well before it is used again.

Sailfin Mollies



Mollienisia velifera

by L. B. KATTERNS

UNTIL about 10 years ago, sailfin mollie was a common name applied exclusively to *Mollienisia velifera*, but today it is used for any mollie having a very large dorsal fin.

M. velifera is rarely seen these days and it is over 5 years since I personally saw one, although there are many fish about under the *M. velifera* label which are crosses of other varieties. The true *M. velifera* is a large fish and it can reach a size of 5½ inches. The dorsal fin in the male is exceptionally large and high; the front and rear rays leave the body almost at right angles, whereas in the other varieties these slope back at a sharp angle, the rear ray in most cases laying almost parallel to the top of the body.

Most of the present-day "sailfin mollies" are man-produced, and the foundation stock in most cases has been *M. latipinna*, and in some cases the strains contain a certain amount of *M. sphenops*. In the wild the general coloration of all species is green, grey or blue with various markings, but black specimens are sometimes found.

Man has devoted much time and expense in developing

these fish, and the results can be seen in some of the fantastic fish offered by the commercial breeders, such as the pure all-black lyre-tailed sailfin mollie and the albino sailfin. Much is being done in the U.S.A. at present with these fish, and the trend shows that it may not be so long before we shall see fish with black bodies and red or yellow fins; already there are some black fish with deep yellow bands on the tail reaching the British market.

Mollies, being livebearers, are mentioned in some books as being easy fish to breed, and even recommended as good fish for a beginner. In my opinion this is untrue and not good advice, and I am sure that anyone who has had much to do with them will agree with me.

Certainly they may live, grow slowly, and even have a few youngsters in the average community tank, but under these conditions the fry develop very slowly and very rarely make good fish, and it is quite common for the female to die while giving birth or soon afterwards. In my opinion it is ridiculous to claim the successful breeding of a fish until one has produced several generations of first-

class specimens, and there are not so many aquarists who can do this where mollies are concerned.

Most specialist breeders have their own methods and pet theories, but there are some points, on which all agree, which must be observed. Plenty of space is the most important of all, and given this the female will rarely eat her young. A large water surface is more important than a large volume of water. In fact, I have found that the best results come from fish born in about 6 inches; they develop far more quickly and the female rarely suffers any ill-effect from their birth.

Females once seen to be gravid should never be netted or handled; to do so is almost certain to cause the premature birth of the young, death of the developing fish in the mother, or the death of the female. Many splendid fish have been lost through sending them to a show in this condition.



Speckled *Mollienisia sphenops*. The dorsal fin of this fish should be compared with that of the specimen of *M. velifera* shown on the preceding page.

Mollies prefer a higher temperature than most live-bearers and one in the low eighties (°F) is advisable for breeding purposes, and it is most important that the water be old and clean and not acid. Many breeders add salt in varying amounts, and while I agree that a little does improve the general condition of the fish I think this can be overdone and should never exceed a teaspoonful to the gallon.

Omnivorous Diet

Mollies are omnivorous and although they will eat almost anything the diet is most important and care should be given to see that they get a nourishing and balanced menu. Vegetable matter must be supplied: the soft forms of algae are ideal and if this is not present in the tank substitutes must be provided. Boiled and mashed spinach is one of the favourites, or crushed lettuce; my own method is to crush a small quantity of duckweed in a pestal and mortar until it becomes a paste and to give a small quantity of this about three times a week.

When a female has given birth to a batch of young it is best to give her a rest of a month or so before placing with a male; over-breeding can only produce poor fish.

If you are breeding for some particular points, culling should be carried out as soon as it is possible to see how the fish are developing, and the sexes should be separated in case undesirable fish mate.

Some Dwarf

THE task of making a garden pool is not nearly so formidable as many people imagine. The main secret (as also with aquaria, greenhouses and any other construction to house living plants or animals) is not to build it too small. It is essential to have as much space as possible, and even then, to restrict the number of both plants and fishes to the optimum for the accommodation available. To be on the safe side it is even better to have less than the optimum; certainly never more.

On the other hand, to attempt a construction of unnecessarily large dimensions when experimenting for the first time with concrete, is another sure way of courting disaster.

The site should be in full sun and the depth of the pool about 1½ feet with allowance for shallower areas at the edges or at one end. The concrete should be at least 4 inches thick and made up of one part of the best Portland cement added to two parts of sand and three parts of shingle (½-¾ in. coarse aggregate). The cement and sand should be mixed thoroughly first, then after incorporating the shingle, water should be added a little at a time until a workable mix is obtained.

Concrete Pond

Whether the pool is informal or regular in shape, the soil on the bottom should be well rammed down, and before the concrete is laid, water should be sprinkled all over it. This will prevent absorption by the soil of water from the concrete itself. After laying, the whole should be covered with damp sacks to ensure that there is not too rapid drying. Of course, the work should not be attempted in frosty weather, or even if frost is at all likely, if a novice is tackling the job.

When the concrete is set, it is of benefit to face it over with a mixture of fine sand, cement and water to seal any small holes, and as an extra precaution many people like to paint over the surface with one of the proprietary waterproofing materials sold for the purpose.

Perhaps the easiest shape to tackle is an irregular basin-shaped hollow, but this is difficult to concrete if made very deep, and it is really better in the long run to tackle something a little more ambitious in a rectangular form with shallow edges. It is easier to concrete rectangular surfaces, for the concrete may be levelled and held in position with boards while drying, but, of course, the initial digging is more tricky. The picture shows a satisfactory method of dealing with the two depths of water required for the plants mentioned below.

Everyone will agree that the finest water plants obtainable are undoubtedly the water lilies and some people will prefer to specialise in these only. For small pools the dwarfs should be chosen, and there are several excellent varieties, among which is *Nymphaea odorata minor*, a white-flowered, very sweetly scented species which can even be grown in tubs. *N. froebelii* is a very free-flowering crimson, also very fragrant, and *N. pygmaea helvola*, one of the smallest, has abundant sulphur-yellow flowers and pale leaves marked with maroon.

Aquatics for the Small Garden Pool

by EDNA KNOWLES, B.Sc.

Some people like to plant water lilies in special plastic pots with small perforations in the sides for aeration. This method can be quite successful, and the pots are easily obtainable, but for the best results the roots should be freely planted in a good heavy fibrous loam, spread on the bottom of the pool to a depth of about 6 inches with a little coarse bonemeal mixed in it.

Flowering Aquatics

Another worthwhile flowering aquatic is the fragrant water hawthorn, *Aponogeton distachyum*, which has tuberous roots. This is only hardy in this country if the depth of the water is not less than 18 inches. It is a spreading plant with floating leaves, and scented petal-like bracts. There are many varieties, all with a very long flowering season.

Damasonium stellatum is a rare British plant, sometimes called thrumwort, with floating glaucous leaves, and dainty white flowers with a yellow spot at the base of each petal. It is only about 6 inches in size, and has interesting star-shaped clusters of seed pods which taper at their ends.

A more unusual type of aquatic is golden buttons, a member of the daisy family, and a relative of our native wild chamomile. This is *Costa coronopifolia*, which grows to about 9 inches, with finely cut leaves and large numbers

of tiny disc-like flower-heads appearing throughout the summer.

Peltandra cernua is a pleasantly aromatic aquatic with a mint-like scent, especially strong in the evenings, which grows to 12 inches. This has narrow bract-like leaves, and heads of scented lavender-blue flowers which make a pleasant contrast to the white and yellow of the preceding species.

Submerged Plants

Two good completely submerged oxygenators are *Potamogeton pectinatus*, with slender hair-like foliage and inconspicuous flowers, and *Oenanthe fluviatilis*, a strong grower with finely cut foliage.

Of small plants suitable for shallower water, a good acquisition is *Acorus calamus gramineus variegatus*, a fine dwarf form of the sweet flag of our own native flora, which reaches barely to 12 inches. The leaves are reputed to smell of tangerines when bruised. It belongs to the arum family. There is also *Alisma ranunculoides* (now known as *Baldellia ranunculoides*), the lesser water plantain, an attractive British water plant which produces tufts of leaves and flowers at the rooting nodes of a creeping stem. The flowers are three-petalled, and of an attractive pale purple colour.

One of the smallest irises for shallow water is the 1½ foot *Iris laevigata albo purpurea*, with blue flowers flecked with white, which will bloom both in June and in September.

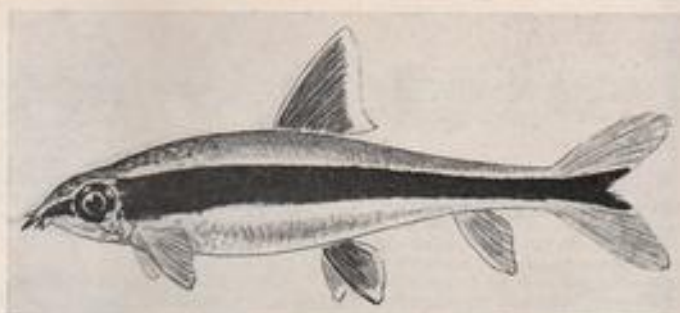
These plants, although restricted in number, are quite sufficient for a small pool, and if necessary can be duplicated, or even trebled while they are acclimatising themselves.



A pond made with a separate water-containing channel surround in which marginal plants can be grown in the loamy medium that these plants require

The Flying Fox (*Epalzeorhynchus kallopterus*)

by
JACK
HEMS



SOMETIMES called the flying fox, or pal, less often the selimang, *Epalzeorhynchus kallopterus*—to give the fish its technical name—is native to the fast-moving fresh waters of Siam, Sumatra and Borneo. It attains just over 3 in. in captivity, roughly twice that size in the wild, and is bottom-haunting and lively in its habits.

Although large specimens will often spar about among themselves, the species can be trusted in a community tank with companions of about its own size, or, to be more precise, with fishes large enough not to be mistaken for live food.

The most characteristic features of *E. kallopterus* are a long, slender body and a twin-barbelled, underslung mouth with the upper lip furnished with a strong horny fringe well adapted for rasping algae off rockwork and broad-leaved plants. But besides being partial to easily consumed greenstuff, it will gobble up almost anything else that comes its way, such as all the regular live and dried foods and substitutes such as scraped raw or cooked lean meat, pulverised cooked liver and uncooked porridge oats.

The coloration is brown on the back, toning to yellowish white on the belly. A black stripe, margined along its entire length with gold, extends from the snout to the bifurcation of the pink caudal fin. The dorsal, anal and

ventral fins are brownish pink at the base shading into a well-defined, greyish to black wedge-shaped marking edged with white. The pectoral fins are a uniform pink to reddish brown. The iris of the bold black eye is red on top and shining gold below.

The essential requirements for this attractive fish are clear, well oxygenated water maintained at a temperature range of 72°F (22°C) to 78°F (26°C), and some retiring places in the form of dense clumps of rooted vegetation. Slightly acid conditions and well illuminated open swimming spaces appear to suit it best. Another thing, the floor of its tank should be bedded with fine grit, or coarse sand, rather than chippings, for it is easy for rapid moving scavengers such as the selimang to rub their snouts sore on a coarse bottom.

I have been unable to trace a record of *E. kallopterus* breeding in captivity, and cannot say what external sexual distinctions, if any, exist. But if it is any consolation, once the fish has settled down in its aquarium and is given proper care and attention, it will live for a long time.

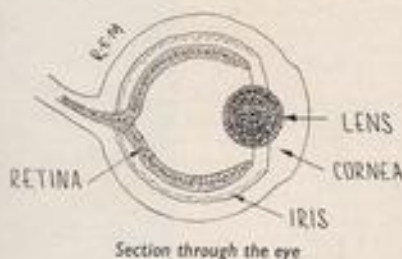
Finally, take care that its aquarium is kept properly covered; for when in the mood, *E. kallopterus* can jump with the agility of a young porpoise.

DISEASES OF FISHES

Worm Cataract

WORM cataract is a disease of the eye and may be confused with grey cataract, for both of these diseases produce opacity in the lens of the eye. On closer examination with a magnifying glass it will be seen that the apparent white film on the lens is caused by the presence of numerous small white dots that are worms seen against the dark background of the pupil. The worms feed upon the lens until they completely destroy it. The disease is not contagious nor actually fatal but if it reaches an advanced stage then a cure will be impossible and complete blindness ensues.

If worm cataract is diagnosed during the early stages of development, treatment for the disease may be applied immediately by feeding the affected fish with dried food soaked in a 1 per cent solution of phenoxetol and the water in the aquarium treated by adding 45 ml. of a 1 per cent



solution of phenoxetol for each Imperial gallon of water in the tank. (A 1 per cent solution is prepared by dissolving 1 ml. of phenoxetol in 99 ml. of water. Phenoxetol can be obtained from dispensing chemists.)

In most cases of worm cataract, however, by the time that a diagnosis becomes possible it is too late to expect a cure and the only course open is to kill the victim.

R. E. Macdonald

Guppies Help in Scientific Research

by W. G. PHILLIPS

*Mr. W. G. Phillips,
who is president of
the Fancy Guppy
Association, last month
celebrated his eighty-
second birthday*



IT all began in March 1953, when there appeared in *Nature* a reference to some guppies born without apparent fertilisation at University College London. The reaction of many fish-keepers, at the time, can well be imagined, and some even claimed to have had similar experiences.

During the many years I have bred guppies I have occasionally discovered very young fry where they were least expected, as in one instance in a tank of males. You will therefore appreciate how interested I was some 3 years later to receive an invitation from Dr. Alex Comfort and Dr. William Hildermann—who had called to see my stock—to visit them and see their fatherless guppies at the College.

In their laboratory fish room I saw large numbers of guppies of no particular variety. They were kept in all kinds of containers, from 24 in. by 12 in. by 12 in. down to 6 in. by 6 in. by 6 in. tanks; in various shaped glass jars, some even in half-pint milk bottles, the last-named being used to segregate the fry at birth. I noticed that each bottle contained a small portion of *Riccia* (crystalwort), which, it was claimed, kept the water sweet for an indefinite period with only one fish in each bottle. Some of the larger tanks had aeration, but no plants. In fact, I doubt if plants would thrive in this fish room, which was about 10 feet square and rather dark. The containers, several tiers high, were accommodated on iron framework built up like a large Meccano set. The room itself was space heated to around 75°F (24°C), with a large overhead propeller-shaped electric fan to ensure air circulation.

The ages of the fish I saw ranged from a day old or thereabouts up to nearly 4 years old. Remembering the life span of the guppy is generally reckoned as 2 years, and how few in fact actually attain that age in our aquaria, I was more than anxious to learn how this longer life had been achieved. Their living conditions as far as I could see were not conducive to longer life. The youngest fry were fed regularly on very fine dried food and the remainder of the stock on whole *Tubifex*, each fish being allotted a portion about the size of a small pea once a week. Nothing else was given to them, except for some particular fish which, for experimental purposes, were given a full diet.

It appears that, contrary to general belief amongst fish-keepers, a fish whose growth is retarded by a restricted diet in early life, rapidly increases to adult size when normal feeding is restored, and the fish lives longer. The life span of the mature fish is not affected by under-feeding and the increased longevity is assumed to be due to a prolongation of its 'childhood'.

I was told by Dr. Comfort, who had been responsible for

the fish since he took them over from Dr. Helen Spurway, that the guppies referred to earlier which were said to have given birth to fry without apparent fertilisation (first reported in the 7th March 1953 issue of the scientific journal *Nature* by Dr. Helen Spurway as an instance of parthenogenesis) have since been regarded as hermaphroditic. Guppies are now maintained at the College purely for the study of old age, known as gerontology. The fatherless guppies were quite incidental and had no part in the study for which the fish were employed.

I was shown some guppies which, having been born of one sex, had been changed to the opposite sex by injection, in a study of the effect of sex hormones on the secondary sex characteristics. Some other guppies I saw were without a caudal fin. This defect seemed in no way to handicap the fish so far as locomotion was concerned. These particular fish were being studied to ascertain the rate of re-growth of finnage.

In another laboratory I saw numbers of coldwater fishes, goldfish and axolotls. Here, I was informed, the re-growth and the grafting of scales in the former and the breeding of the latter were being studied. It seems that the sex of offspring may be determined by the biologically weaker of the two parents. This may account for the preponderance of one sex which sometimes occurs in a breed of guppies; at least that is definitely the case insofar as the axolotl is concerned.

Later, in Dr. Comfort's laboratory I saw how the rate of re-growth of finnage was determined. Each day the fish under observation are placed in a specially made glass container and photographed. The film is then projected on a small screen and greatly enlarged to make measurement of the daily difference in re-growth possible. The actual measurement is then recorded on a graph so that the rate of re-growth can be seen at a glance. It seems that fins, when lost or damaged by accident, will re-grow very quickly at first then gradually slow down until normal size is regained.

Before leaving the College I asked my hosts if they would like to answer a number of questions I had prepared beforehand. To this they readily agreed, and I give the questions and their answers here.

Do you change the water very frequently?

No. With all the containers in use it would be quite a task if one had to do so.

Why do you use Tubifex?

Because it remains edible longer than any other food.

Most fish-keepers I know say Tubifex can be dangerous as

a fish food no matter what precautions are taken to cleanse it. Do you agree with this?

Yes, I do, but under these circumstances it seems most suitable.

Don't you think *Daphnia* can also be dangerous?

Yes, in the ordinary way it can be very dangerous if it is not reared aseptically. I've bred our own from pure cultures.

Do you agree that female guppies continue to grow long after their brood brothers have stopped growing?

Yes, the males appear to have a growing phase whilst females appear to grow throughout their lives.

When I am asked a question relating to fish-keeping and to guppies in particular and I have no previous knowledge concerning the question, I always think back to the human race for a comparison and I invariably find the answer. Would you agree that this is a good method?

In some cases I would, but not always, because the guppy is different from most other fishes, including other live-

bearers. In humans, for example, whilst the male is responsible for the determination of sex of progeny, that is not always the case with the guppy. You will remember that some of our guppies were born without the benefit of a male and then there is sometimes a crossing-over of the X and Y sex determiners; such cases are very rare and can only be accepted as such after long and careful investigation.

Much of what I have recorded here could prove of benefit to some fish-keepers, for although they may have had fair success with other tropicals they have difficulty in keeping guppies.

Since I paid this visit to University College London, the maximum observed life span of the guppy has been extended. It has been reported that some female guppies at the College have proved fertile up to 5 years of age and over, and more recently that one female lived to just over 6 years!

The Texas Mud Baby

by B. FRY



IT is difficult to imagine a lovelier plant for the tropical aquarium than *Echinodorus cordifolius*, which is still frequently referred to by its recently altered name of *E. radicans*. The plant is native to Mexico and the more southerly states of the U.S.A. and has rather elongated, prominently veined, heart-shaped leaves that in the main are held at right angles to the strong stems.

Not all the leaves, which average about 7 inches in length, stay submerged. Quite a few float, and these develop a waxy surface which repels every drop of moisture. Aerial leaves are also produced and later, if conditions are right, a stem bearing plantlets and white flowers followed by fertile seeds. After a fortnight or so, the plantlets can be detached from their growing points and nursed along in a few inches of water.

E. cordifolius will last a very long time in the aquarium if it is given the right sort of treatment. Its essential needs are a rich growing compost and clear, that is sediment-free, water having a slightly acid reaction. A light somewhat brighter than is suited to *Cryptocoryne* species and a temperature of about 75° F (24° C) is about right. A shallow

pot or pan filled with a 1:1 mixture of fine grit and pure yellow clay suits it very well. This mixture should be topped with 2 inches of washed grit or sand to prevent the fish stirring up the mud.

It is no use attempting to grow this plant in a tank measuring less than 24 in. by 12 in. by 12 in. because if you do the leaves will be cramped for space. Another point to bear in mind is that unless you intend to grow the plant for seed, it is recommended to cut away the floating and aerial foliage as it appears, for rampaging top growth saps the strength of the plant and leads to a deterioration of the submerged leaves.

In America, *E. cordifolius* is usually referred to as the Texas mud baby or elephant ear. In the 1930s, when it was first introduced to aquarists, it went under the erroneous botanical name of *Sagittaria guayanensis*.

Planarians

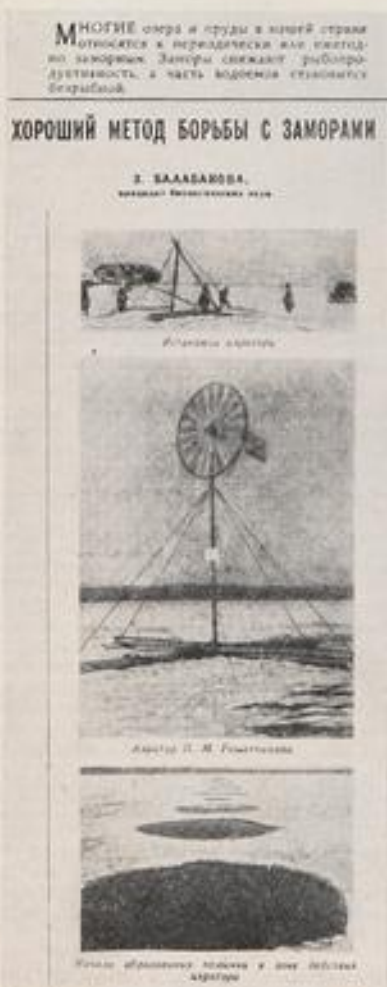
THESE are the tiny flat worms of a dirty white colour that are sometimes seen moving over the glass sides of an aquarium. In general, planarians are nocturnal. That is the reason they are seldom noticed in a tank until the light is switched on over it at night. The worms feed on fish excreta, uneaten fish food and other sorts of decaying and rejected matter. As will be readily realised, they flourish best in dirty bottomed, neglected tanks. Planarians are harmless to fishes larger than newly incubated fry, but probably do quite a lot of damage to some of the spawn in a breeding tank. It is not easy to eradicate planarians completely from a tank, but their numbers can be reduced to a minimum by dip-tubing the debris away regularly (or running a filter) and keeping fishes likely to make a meal from them such as the flying fox, the Siamese sucking loach and gouramies and mollies, which go over the vegetation and the sides of the aquarium with their fleshy lips.

"Winter Kill" in Canada and the U.S.S.R.

by FRANCIS DICKIE

BY an amazing coincidence fishermen, 5,000 miles apart, unknown to each other, have worked out similar methods to save valuable commercial and sport fishes. Exactly the same invention, to overcome a problem never previously satisfactorily solved, was developed by fishermen in Russia about the same time as that in British Columbia.

The official Soviet government publication, *Fish and Fish Culture*, printed the pictures (shown here) that reached Vancouver, British Columbia, in the same month as similar



Similarities between the windmill apparatus used in Canada and that developed in Russia are shown in the pictures on this page

photographs were made at Kilpoola Lake, B.C., of the same experiment. The striking similarity between the Soviet pictures and those of the British Columbia experiment are apparent.

The project developed at Osoyoos, British Columbia, is so much like that described in the Russian journal that the Soviet text could have been translated to describe the British Columbia successful experiment.

When someone suggested that the installation of a windmill at distant Kilpoola Lake, B.C., would overcome the regular "winter kill" of fishes there, it sounded like a pretty wild idea. The Osoyoos Fish and Game Club had undertaken some difficult projects in the past but the windmill proposition seemed as unlikely an undertaking as they had yet encountered.

"Winter Kill"

"Winter kill" is a phenomenon observed in many British Columbia lakes. Such lakes are usually shallow and warm up readily in summer. This encourages a heavy growth of microscopic plant and animal life known as plankton. During the summer there is plenty of oxygen available at the lake's surface, but this is cut off each fall when the lake is covered with ice. The continuing decay of the plankton, produced in summer, results in heavy depletion of oxygen and, as winter conditions continue, the oxygen may be so much depleted that fish life is destroyed.

Many attempts have been made to oxygenate the water

Five holes were made in ice 5 inches thick by the action of air pumped along the lake bottom by the windmill

in such lakes and so overcome "winter kill". Manual destruction of lake ice, mechanically operated pumps to stir lake waters and the scattering of lamp-black to induce ice melting, are among the methods that have been tried. As far as can be ascertained, the Kilpoola Lake experiment marks the first time in North America that a windmill has been used, although the principle was also adopted by technicians in the Soviet Union.

Underwater Pipe

The first step was to lay a perforated pipe along the bottom of Kilpoola Lake, then the erection of the tower and the installation of an air pump geared to the reciprocating action of the windmill. The force of the wind would press air along the pipe on the lake's bottom, thereby circulating the warmer water at lower levels and preventing the surface of the lake from freezing. Five inches of ice covered Kilpoola Lake when at last the windmill went into action and a large crowd had gathered to see what would happen. The people grouped themselves around a hole that had been cut through the ice at the foot of the windmill. As great air bubbles were seen being forced up through the hole, a loud cheer went up. The plan had worked. Within 48 hours the warmer sub-surface waters cut through the ice in five large, round rings. The battle of "winter kill" in Kilpoola Lake had been won, just as it had been won in northern Russia.



OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

In my recently set up aquarium the compost along the front glass has turned dark grey to black. Does this change in the colour of the sand indicate that something is wrong in the aquarium and, if so, what caused the trouble and what should I do?

A blackened sand indicates that pollution is going on at or under its surface. The pollution can be caused by uneaten food left to decay on the bottom. Another thing that will cause pollution are bunches of dead plant roots rotting under the compost. Yet another cause is a compost too fine to permit circulation of the water. The best thing you can do is to scoop the discoloured sand out of the aquarium and replace it with fresh. See to it that no debris is left to accumulate on the bottom and, if dried food is given, dip-tube the area where food settles daily, and introduce a catfish to act as a scavenger.

Do you think any harm will come to my tropicals if I introduce two small terrapins into their aquarium?

It is most unwise to introduce terrapins into an aquarium containing fishes. Terrapins are flesh eaters and sooner or later they will snap at, or make a meal from one or more of your finny pets.

I set up my aquarium about a week ago. The second evening after filling it, I introduced some guppies, platys and swordtails. Since then I have noticed that the fishes keep rubbing themselves against the sand and the sides of the glass. Can you tell me what is wrong?

It seems that new water sometimes sets up an irritation of the skin, which causes fishes to behave in the manner described in your letter. But as the water ages, the rubbing actions will gradually die down, and very soon the inmates of your aquarium will swim about in a normal manner.

Many queries from readers of *The Aquarist* are answered by post each month, all aspects of the fancy 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.

I bought a pair of black mollies, and soon after I placed them in a tank the female dropped some young. These fry are now a few weeks old and show some light patches. Is this a symptom of disease, or some sort of diet deficiency?

All-black mollies do not always produce all-black fry. It sometimes happens that the youngsters show pale areas. Yet as the fry mature the pale areas may darken. If they do not, and you permit these mottled fish to breed together, the all-black strain will be spoiled for the future. In short, keep the all-blacks separated from the not-so-blacks.

Please give me some information regarding *Rivulus cylindraceus*.

R. cylindraceus attains about 2 in. in length. It is native to Cuba, and does well at a temperature range of 70°F (21°C) to 75°F (24°C), this being raised to about 77°F (25°C) for breeding. Eggs are laid over a period of a week or so, and after the rather large fry hatch out they will accept any small live or dried food. *R. cylindraceus* is an adept jumper, and its aquarium must never be left uncovered.

Would you recommend angel fish for a beginner's community tank?

Small angel fish are quite suited to life in a community tank housing inoffensive companions. But angel fish more than 2 inches long often quarrel among themselves (the larger ones picking on the smaller ones), and will bully other smaller, different species.

I have just bought two small *Symphysodon discus*. They have gone on hunger strike and will not eat the live *Daphnia* or dried food the other fishes in their aquarium accept greedily. What should I do?

S. discus will usually accept worms of one kind or another. We suggest you try them on white worms or *Tubifex* dispensed via a perforated feeder.

The other night I took the temperature of the water close to the surface of my aquarium. It was much warmer than the water near the bottom. Will this difference in temperature have a harmful effect on the fishes?

Fishes soon get accustomed to extra warmth near or at the top of an artificially lighted aquarium, and come to no harm. In fact, some species seem to enjoy basking in the substitute sunshine; fishes in the wild warm themselves in the shallows.

What is the life-expectancy of the white cloud mountain minnow?

The white cloud mountain minnow has a life span of between 2 and 3 years. Of the two sexes, the female usually outlasts the male.

My 26 in. by 15 in. by 15 in. tank always looks cloudy even though I employ several catfish to act as scavengers. How can I prevent the water becoming filled with swirling sediment?

You probably have too many catfish stirring up the bottom in their habitual search for food. Two catfish are sufficient for a 3 foot tank. Another thing, perhaps you are over-generous when you are feeding with dried food. We suggest that you give the floor of the tank a good going-over with a dip-tube or siphon, and exercise more care in feeding in the future.

Where does *Nepheobranchius palomquisti* occur in the wild, and has it ever bred in captivity?

N. palomquisti is native to East Africa and, although it is a comparatively new introduction, it has bred several times in captivity.

How much aquarium cement will I need to buy to glaze a 24 in. by 12 in. by 12 in. aquarium frame?

You will need about 2½ to 3 lb. of cement to glaze a frame with the measurements stated above.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I have a 24 in. by 12 in. by 12 in. tank with an aerator and filter. It is well planted and has three common goldfish, two golden orfe and two diamond bass. They are small and only total 14 inches. The temperature of the water is about 70°F (21°C), owing to central heating in the room. Could I add a couple of species of tropical fishes, as I would like to get more variation?

If the temperature remains fairly constant at about 70°F you could keep many kinds of tropical fishes, but you must not overcrowd. Such types as mountain minnows and paradise fish would be quite suitable as even if the water lost some of its warmth at night they would not be troubled by this.

I have a small moor which will only take dried *Daphnia* from the surface at night. It completely ignores any live food dropped near it in the day time. Is there anything else I could try?

It may be that the moor has defective eyesight; this could account for it ignoring live food by day. Examine the eyes to see if there is a film over them. There appears to be no other reason why the fish should not eat live foods.

I would be grateful if you could let me have any information regarding keeping goldfish and tropical fish.

This is a tall order! It would take volumes to give you this but there are plenty of books to be had which deal with this very complicated and inexhaustible subject. Make a start with the following books from *The Aquarist: Coldwater Fishkeeping, Tropical Egg-layers and Livebearers*. These should give you a good start and by the time you have been keeping fish for 60 years, as I have, you will have learned quite a lot but still not all!

It may interest you to know that a pond I made in the school playground lost many goldfish to crows, swooping down and taking them from the surface. These incidents were noticed during mild spells after severe weather. What can be done about this?

I have had to cover my garden pond with wire netting on four frames. I can lift these off during the day time when I am about. I cover them to protect the fish from cats and owls. If there was a good cover of water plants, even duck weed, the crows might not see the fish. Unfortunately, most water plants die down in the winter, which is the time when you get your trouble.

Last year I made a pond in the garden, using polythene sheeting. It is now leaking and I would like to know what is the best and easiest method of making the pond water-proof. Is there any other method as good as concreting? Could you give some advice on carrying out this task?

Perhaps the pond leaked because there was a sharp substance below the polythene which punctured it. Concrete will make a lasting job as long as it is constructed correctly. If you make your pond with sloping sides you can then dispense with shuttering and so save a lot of expense. You can use aggregate and cement (three parts to one of cement) for a first coating and then float this over with a mixture of three parts of clean sharp sand to one of fresh cement.

Our local Council has agreed to hold a garden pond competition in conjunction with their annual garden competition. We, an aquarist society, have been asked to supply the judges and would be glad of any information about a pointing system which you can supply.

A maximum pointing of 100 would be a good limit. Then 25 points could be awarded to the general appearance of the pond and its immediate surrounds, that is its attractiveness, colour, tidiness etc. A further 25 points are allowed for the occupants, such as fishes etc., their condition, quality and suitability. Another 25 could be for the plants, both submerged and marginal. The condition of the plants and selection would, of course, be taken into account. The remaining 25 points could be for the condition of the water, clearness, not overgrown with plants, and so on. This system would be fair for all and I think suitable. I have used a similar system when judging canal lock gardens over the past 12 years, and found that it works well in principle.

I have a goldfish, a comet and catfish in an 8 gallons tank. I feed them well and the tank is well planted. I now see that the tail of the comet is frayed. Can you explain this, please?

There is little doubt that it is the catfish which has been nibbling at the tail of the comet. These fish are renowned fin-nippers. They will also eat any fish small enough for them to swallow.

The Three-Spot Gourami



Male three-spot gourami (*Trichogaster trichopterus*)

by M. J. PARRY

THE group of fishes known as anabantids (labyrinths) are, to both beginner and experienced aquarist alike, very popular. Of the many fishes found in this group there is one that stands out above the rest for ease of breeding, and it is this fish I intend to describe now.

The three-spot gourami, native to the Far East, particularly India, Malaya and Thailand, is, when young, often sold to beginners, particularly as a fish for the "community tank". This small, attractive little fish soon makes itself well at home, and will agree most amiably with the other occupants of the tank. It is, however, very unfortunate that it grows so quickly, as within a year a 1 inch fish will have grown into a 5 inch giant. Even at this length it is not an aggressive fish, though one must agree that it would look completely out of place with regard to the size of its tank-mates. It would now be best therefore to move it to a tank of similar sized fishes, or provide it with a home of its own.

One often hears of cichlids pairing off and breeding, yet this is also true with the three-spot gourami. It is, indeed, a prolific breeder, and a pair left to their own devices would soon overwhelm their owner with both size and number of brood. It is not even adverse to spawning in the community tank, though this does tend to present certain problems with regard to space etc., together with the length of time the aquarium is occupied by the bubble nest.

If breeding is contemplated both fish should be removed to a separate tank in which they may spawn at leisure. Although not always essential it is a good practice to condition the fish first, this being done on lavish amounts of white worms, *Daphnia*, *Tubifex* and particularly Bemax, which these fish relish.

The breeding tank, preferably not less than 24 in. by 12 in. by 12 in., should be set up to include neutral or slightly acid water, pH 6.8-7.2. It should be sparsely planted with anchored bushy plants such as hornwort, *Elodea crispus* etc., and be maintained at 80°F (27°C). This temperature is a critical one, as above this the bubbles of the nest will burst too quickly, and if below this there is not enough extra incentive for the fish to spawn.

The plump female should be introduced late at night, followed a little later by the male. Early next morning the male will begin to build his bubble nest, assisted in this venture by the female. This action cannot be mistaken, as the fish continually rise to the surface to gulp in air, and move under the bubble nest to release the bubbles, which stick to form a compact nest.

On completion of the nest, the male vigorously drives the female around the tank, until when exhausted both come to rest under the nest. Here in quick action he turns the female completely upside down, wrapping himself around her and squeezing out the eggs, which float into the bubble nest. This action takes place many times, until as many as 750 eggs have been deposited. After completion of spawning the female should be removed to another tank, away from the amorous male. As far as the male is concerned he will now prove to be the perfect parent, and until the eggs hatch, usually after 48 hours, will continually add fresh bubbles to the nest. Within 48 hours numerous tiny splinters will be seen adhering to the sides of the tank. It is now advisable to remove the male.

After a further period of 48 hours the fry will have become free-swimming, and they should now be given their first feed of Infusoria or, alternatively, egg-yolk. This diet

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Why I Became a "Guppiot"

by MALCOLM DELINGPOLE

SINCE my first days at school I have been fascinated by small brightly coloured collectors' pieces. This is why, like many of my contemporaries, I collected British Colonial postage stamps and hunted butterflies and moths. However, these two, although trouble-free, once they were suitably mounted, lacked a certain something, and it was not until many years later that I was able to "latch" on to this missing dimension.

At an early age I was given a 3 foot coldwater tank by my father in which I kept goldfish, shubunkins, catfish, dogfish and I believe, a tench. However, when, at the age of 12 or thereabouts, I received a tropical tank as a Christmas present my affections soon changed.

When I left school my mother allowed me to have a few extra tanks and her glassed-in verandah was soon entirely surrounded by aquaria of varying sizes. Not unnaturally, my first youngsters were guppies, but these were of the near-wild type then available. These rather uninspiring "angel-meals" were followed by speckled mollies, red swords, green swords and Berlin swords. These last-mentioned fishes were the first I had bred wherein any difference between the individual youngsters was really marked; but, through melanin disintegration, those specimens with plenty of black in them became horribly "moth-eaten", and this type of sword seems to have been superseded by the tuxedo and the Simpson.

"A Complete Guppiot"

"Did you try egg-layers?" you may well ask as you see me lying there on the psychiatrist's couch, as you try to find out what made me what Phil Jinks calls "a complete guppiot". The answer is yes; as your first few young zebras are seen struggling out of the mass of pebbles that have protected them while they were hatching, and to see them sticking like minute sycamore seeds to the side of glass, are moments that most aquarists will have found more thrilling than any other. Soon after this I bred white cloud mountain minnows and one of the gouramies, also Siamese fighters, though I never raised these last fish to maturity.

I think I might have continued along these lines, had not 4 years in the Royal Air Force intervened, during which I found myself in Hong Kong for 2½ years. My interest in fish waned somewhat, although I did have an abortive attempt at keeping an aquarium in my billet—with official written permission! However, I acquired a couple of cameras and became secretary of the camp camera club.

On my return to England I found that my mother had repossessed the verandah but had kept my main tropical tank going; some of the original fish were alive and, wonder of wonders, my white-worm culture was flourishing.

Having no further prospects of being dragged from the bosom of my family in the immediate future, my parents could no longer find an excuse for preventing me from building a fish house. This was duly constructed and fitted out with tanks ranging from 15 in. by 12 in. by 10 in., up to 36 in. by 18 in. by 18 in., numbering around 50 in all. The place is fairly well insulated and has a two-layer glass roof, though it is not properly double glazed—a course which I have since regretted. It measures 14 ft. by 8 ft.

and has given me untold pleasure for the last 6 or 7 years.

I had visions of commercial breeding and produced broods of one or two of the more popular tropicals, but found this very repetitive once I had achieved success with a new variety; and half-grown white clouds are not exactly a big money spinner, although there is a steady demand for them. In point of fact, really good adult guppies are probably more sought after than anything else by any dealer who has once had any through his hands. However, these are very difficult to produce, despite all opinions to the contrary. Anyone can get a guppy to "pup" but to learn to rear really first-class fish takes many years of enjoyable experience, and each one is an individual work of art.

This, of course, brings me to my point. I had a "stab" at one or two of the fancy guppies that were then appearing in dealers' tanks and immediately lost interest in all other tropicals.

Why?—I think for the simple reason that the likelihood of my producing a guppy as good as its father in those days was somewhat remote. Also the various ruses I had to adopt to ensure that a female produced a good big brood made continued effort really worthwhile.

However, the paramount difference between breeding say, neons, which are admittedly of brighter hue, and guppies, is that though the achievement of breeding may be greater with neons, guppies do allow you to express your individual taste through them. Let me try to make my point clear; consider Harry Wheatcroft and his roses and the achievement he must feel when he has produced a new variety which is in demand all over the world. However, a rose is only a plant, albeit a very beautiful one, but it lacks that vital fourth dimension that we see in those little multicoloured gems that glide silently round our guppy tanks. Now, in the guppy (1964 version) we have, thanks to Paul Halmel and others, a number of guppies with large well-balanced tails, the scarftails, veiltails, fan-tails and trianglerails in infinite variety.

Veiltail Guppy

I should like to dwell on my own personal favourite, the veiltail guppy. In the form accepted by the Federation of Guppy Breeders' Societies this has a large broad-based dorsal which must not extend beyond the caudal peduncle. This latter is very difficult to maintain. The tail fin is as long as the body, but increasing in width in a gradual curve, maximum width being 5/8 in., which occurs three-quarters of the way along its length; the end is concave. I breed these lovely fish in its black form, which is so popular that we give it a separate class, also in red, blue, multicoloured, gold and gold lace forms, and between these colours and various strains in these colours I can ring the changes at will.

If I cross a black male with a red female I produce a strain of new multicoloured youngsters; and if I cross one of the female offspring back to its father or an uncle I get a new stronger strain of black veils. In this way, and using every potential outcross of veiltails I have in my tanks, I should need a fish house ten times the size and

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Water Plants of the Genus *Ludwigia*

by B. FRY

THE genus *Ludwigia*, named by the great Swedish naturalist Linné, or Linnaeus, in honour of K. G. Ludwig, who taught medicine at Leipzig in the eighteenth century and was also an ardent botanist, is represented to aquarists by about six species out of 30 or more catalogued at Kew.

Perhaps the most widely known species is *L. natans*, which, until quite recently, was referred to as *L. mulerii*. This plant is native to the habitually moist banks and shallows of many of the fresh waters of southern North America and beyond. Like all cultivated ludwigias, three things are necessary for its success: a rich compost (a pot of non-fibrous loam kept open by the addition of some sharp sand and crushed charcoal is recommended), a good top light and clear water not more than 12 inches deep.

It is an outstandingly beautiful plant; for given the conditions it likes best it produces branching stems densely clothed with rather broad lanceolate leaves coloured golden green above and rose red on the undersides. Occasionally pinching back the central and side stems always encourages the formation of a more bushy growth. It is not over particular about temperature, but invariably keeps its foliage lovelier looking and longer at a temperature range of 62°F (17°C) to 75°F (24°C). At a temperature below 70°F (21°C) the green of its foliage becomes generously suffused with a rosy hue.

Another *Ludwigia* which assumes pronounced reddish tints at a low temperature is *L. arcuata* from eastern North America. The leaves of this plant are narrowly linear and grow all the way up the vertically ascending stems. Dense thickets of this plant make admirable spawning grounds for egg-scattering fishes, or comparatively safe havens for livebearer fry. *L. alternifolia* is a prostrate grower best suited to very shallow water. Its young leaves are a rich bronzy red, but its mature foliage assumes bronzy to olive-green tints. It is native to the warmer parts of the U.S.A. and needs a sub-tropical to tropical temperature. Some writers have referred to a Floridan species called *L. Curritoti*. This plant is said to have narrow, spoon-shaped leaves growing in pairs on erect stems. It is reported to grow reasonably well in the well-lighted tropical aquarium.

From tropical South America comes *L. potamogeton*. This plant resembles *Hydrophila polysperma* in the shape of its foliage and manner of growth, but in general is of a lighter green colour. To add to its charm, the leaves are modestly suffused with pink.

L. palustris, a European species, can be found in the

wild in certain areas of southern England. It is known under the common names of water purslane, marsh isardis or false loosestrife. The oval leaves are shiny, privet green, red on the undersides, and grow in pairs on the branching stems. *L. palustris* lasts longest in shallow, cold water, and soon loses its foliage and dwindles away under tropical conditions. In favoured localities it does well as a carpeter around the boggy margins of a garden pond.

Indoor Waterfall



Fitting into the corner of a room, this new fibre-glass pool and waterfall has an inbuilt pump and filter and can be used for tropical or coldwater fishes together with water and house plants. The "Cahilyan Waterfall" is 5 feet in radius and costs £27 2s. 6d.

Why I Became a "Guppiot"

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still not be able to carry out all the experiments I have in mind.

Apart from out-crosses we can also "in-breed"; that is, crossing brother to sister, and father to daughter, gradually to improve an existing strain, a process which can take many generations. So I think you will now be able to see why even with a big fish house the guppy can be a hobby on its own.

I haven't mentioned the local guppy breeders' societies, but with our monthly table shows, usually with two or three varieties each month, we keep in contact with other guppy breeders and maintain a keen and friendly rivalry which goes on throughout the year.

The Three-Spot Gourami

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should be maintained for 3 weeks before moving on to newly hatched brine shrimp, along with the other normal fry foods.

At this stage a critical period of growth will have been reached, as it is now that they start to develop their auxiliary breathing organ, the labyrinth. Many losses can be expected, as this fish is particularly susceptible to draughts, the exclusion of which is not always possible. To counteract this it is best, after the fish have hatched, to cover the top of the aquarium completely with a glass cover, thus offering some extra protection for the fry.

The three-spot gourami fry are quick growing, and 1 inch length should be reached within 8 weeks.

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.



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

When Marine Tropics?

AFTER reading your Editorial in the May issue headed "When Marine Tropics?" I thought readers might be interested in the following.

Starting 10 years ago, after 2 years of experimenting with Malayan estuary fishes, I obtained my first Indian Ocean reef fishes: four *Amphiprion bicinctus*, two of which died within 48 hours, and two *Dascyllus trimaculatus*, all of which lived happily for 2½ years and quadrupled their original size (they were only lost through an outside influence causing a stupid mistake on my part).

Other reef fishes which I successfully kept were *Dascyllus auratus* and *D. carneus* (the latter is the fish in your May cover picture—not the former, as stated). *D. auratus* is a silver and black striped fish something like the marine sergeant major, whilst *D. carneus* as illustrated is fawn and metallic blue with a white tail, its fins closely resembling the blue butterfly pendants that were popular many years ago. It is by far the most beautiful of all that family; the pair in my possession spawned and young were hatched on two occasions.

One of my favourites was a surgeon fish, which I could never find the scientific name for; however, it was listed in an American aquarium guide as a yellow tang and was stated to be rare. From thumbnail size I grew it to 2½ inches; it did not interfere with the other tank occupants but they all gave him a wide berth. Marine tropics are far more intelligent than their freshwater cousins and far more quarrelsome. *D. trimaculatus* has a loud voice and can be very noisy; he will savagely attack your hand with needle sharp teeth, hanging on and shaking fiercely. *D. carneus* is very good-tempered and has a habit of fanning the sand with its tail in search of food. *D. auratus*: I found uninteresting, though an attractive extra.

By far the most bizarre was *A. bicinctus*, a large and beautiful clown fish with brown and enamel white bands with blue edges separating the colours. These fish were only happy when there were anemones present; in fact, all four varieties last mentioned seemed to benefit from their presence. I found the snakeback anemones collected on the south coast stood the 72°F (22°C) temperature best.

Feeding was simple; an arrangement with a local shell-fish shop for an all-year round weekly supply of mussels is essential, as this forms their basic diet. After dropping the mussels into boiling water, the flesh was cut up with scissors. The other favourite was white worm, but the fish went out of condition quickly if deprived of the mussels; brine shrimp is not essential and too small unless adult. A very steady temperature and spotlessly clean water is

essential, so a reliable thermostat with plus and minus one degree and an efficient filter (glass wool only, 24 hours a day) are musts, as is a good coral collection for cover from each other. The fish choose their own piece of coral as home and when the tank is changed care should be taken to replace the coral exactly as before or you will have a full-scale war!

Finally, if sea water is used instead of the modern salts remember that its maximum life is 3 months, and always keep a reserve in a dark place. Avoid all metal and soak any plastic or polythene pipes for at least 48 hours in strong salt water before use. Do not use shells which fishes can get into. Forget about pH, but watch density. Change water rather than attempt correction as one fish is more expensive than 30 gallons of sea water from Plymouth Marine Biological Laboratory.

D. T. LOGAN,
Long Ashton, Somerset.

A London Show in 1966?

I HAVE been following the correspondence in your columns regarding the "National Aquarium Show" with interest. My interest, however, is not merely academic, since about 2 years ago the British Ichthyological Society was considering holding a special show in London for both aquarists and anglers. We felt at the time that the joining of the two interests could provide us with a larger and more lavish show, which would gain more publicity and support, and be more likely to succeed.

The plan was dropped when *The People* and the Association of Fishing Tackle Makers decided to hold a Show for anglers in London in April 1964. The British Ichthyological Society had a stand at this Show, which proved to be highly successful; so successful that it is to be moved to the New Horticultural Hall next year, when the Society hopes to exhibit again.

The obvious success of this Show seems to suggest that a show for aquarists could succeed, and we believe it would be possible for us to arrange one for 1966, if we got down to it now. A great deal, however, would depend on whether the trade would be willing to take the risk, in exhibiting at the show, and, of course, a sponsor would have to be found. I would, however, be most interested in hearing from any societies in the London area, and of course any national organisations, who would be interested in helping to bring about a show in the near future. If enough interest is shown, the Society will then approach a suitable sponsor, and report through the pages of *The Aquarist* any progress.

Finally, I would like to point out that I have no wish

to steal anyone's thunder; the B.I.S. has had this in mind for some 3 years, and is therefore not taking the idea from anyone else. I feel personally, though, that this should be a joint effort, on the part of all societies connected with the study of fish. All I intend to do now is make certain that the interest engendered by recent correspondence does not die down without anything being done to explore the situation.

JAMES MCM. URE,
Secretary general, British Ichthyological Society,
Glasgow, S.A.

Simple Daphnia Culture

I AM writing to acquaint readers of my attempts to breed *Daphnia*, after reading of the difficulties experienced by some of your readers. I sank an old kitchen sink into the ground last summer, and filled it with water into which I put boiled lettuce leaves to produce *Infusoria*. After a week I put in about a shilling's worth of *Daphnia*.

These *Daphnia* have survived and breed throughout the past winter, during which time the sink has frozen over several times. They provided my tropical and coldwater fishes with a welcome change of diet.

M. LEWIS, Bristol.

Failure of Plant Growth

DURING the last year I have frequently heard experienced tropical aquarists assert that, though the fishes are doing better than ever, the plants are not. In my own experience I have found it difficult to establish *Cabomba*, *Vallisneria* and *Myriophyllum*, and I have heard of other cases where close control of temperature, light and nutrients in previously thriving commercial concerns has failed to produce saleable plants.

As always, there are plenty of possible explanations, which range from fluoride in the water to diesel fumes in the air, but, in my opinion, none that I have heard so far rings true. I would like to establish whether this problem of failing plants is only a local one or whether it is felt on a wider national scale. I would be most grateful for readers' opinions.

K. M. HARRIS,
Teddington, Middlesex.

Recognition of Achievement

QUITE recently a friend of mine managed to spawn the Congo salmon (*Phenacogaster interruptus*). To the best of my knowledge this species of fish hasn't been spawned by an amateur in Britain before. I know that some people will say that it was a lucky fluke, but he has also had success with other fishes, e.g. the emperor tetra, which at the time (early 1963) I hadn't heard of anyone else having bred. He also breeds other difficult species like cardinals and neons.

The point I would like some comment on is that there doesn't seem to be any form of recognition in our hobby for this kind of achievement. I think that a medal or a plaque could be awarded to people who manage to spawn new species or species that haven't been spawned in captivity before. Club secretaries and one other person could enter these claims and witness them and some responsible body, like the F.N.A.S. here in the north, could consider these claims and award the appropriate person. Probably some official from these responsible bodies could also call round and see the fry himself.

As it is now, there isn't anything apart from gaining extra points for variety in a breeders' class to give this type of breeder encouragement to try other new species.

B. R. GORTON,
Show secretary, Accrington and District
Aquarist Society.

The AQUARIST Crossword

Compiled by M. W. SAUNDERS



CLUES ACROSS

1. Star-shaped alga (10)
2. Genus of a type of flagellate (7)
3. If of the fruitful variety might be bare in winter and bear in summer (4)
4. Don't make one out of this clue and you'll surely get the answer (5)
5. A mixed up pet doctor gives you time (5)
6. A three-toed ostrich (4)
7. Anger and fire, mostly (3)
8. The moon gets around with nothing (4)
9. According to the song, it rushes in (4)
10. The Law's is long (3)
11. A home for animals (4)
12. Descriptive of a jockey (5)
13. Separated (5)
14. Mediocre (4)
15. A fish out of water, maybe, but it sounds like he's in water (2, 2, 3)
16. Where Hayley Mills might have met a *Barbus pentazonus* (2, 5, 3)

CLUES DOWN

1. Of birds and fish (3)
2. Winter worry of goldfish pond owners (3)
3. A sailor's boy—in summer for example (6)
4. Spin again and come back (6)
5. A lot could be written about this water dweller—and not in ink! (6, 4)
6. Russian sailor, or a butterfly (3, 7)
7. What you do when you sleep. Untrue (3)
8. You might get this from a tinned pin (3)
9. Listen to it again (6)
10. Members of the characin family (6)
11. Digested by a *Geophagus brasiliensis* evidently (3)
12. Strangest (3)
13. Every new tropical fish is—originally (6)
14. Making a mistake about the headless fish (6)
15. Belonging to (3)
16. Go round for tea and do so (3)
17. Might cause a labyrinth fish to gulp (3)
18. A medicinal spring (3)

Solution on page 74

News

from AQUARISTS' SOCIETIES

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

A N.I.W. society has been formed for Coalville and District, and after the inaugural meeting membership is already in the region of 35. Members were welcomed by Mr. J. A. Reed who said it was obvious from the number present at the meeting that there was sufficient interest in the district to warrant the formation of a society. He introduced two members of the Burton-on-Trent Society, who gave advice and information on the running of a society.

It was decided to hold general meetings on the first Monday of every month with alternative arrangements on special occasions, and it was also decided to join the Midland Association of Aquarists Societies. Officers elected were: chairman, Mr. J. H. Hensley; vice-chairman, Mr. A. G. Ings; secretary, Mr. J. A. Reed, 391, Ashby Road, Coalville, Leics.; treasurer, Mr. P. Bower; competition secretary, Mr. G. Degg; social secretary, Miss A. Ward; committee, Mr. G. Upton, Mr. J. Beet, Mr. J. English, Mr. M. Yeomans and Mr. R. Brontley. The society have already set themselves an ambitious draft programme, including, it is hoped, the participation in the N.A.A.S. open show at Bingley Hall, Birmingham, in August. An inter-society show with Burton-on-Trent Society has also been arranged.

THE formation of a new aquarist society is announced from Walsall, Staffs. The name is "The Society of Aquarists of South Staffordshire" (Abbr: S.A.S.S.). Meetings held fortnightly at the "Sook Hotel" Walsall. The founders are: Mr. W. Eglington, Mr. D. Slater, Dr. P. Hammett. Any persons interested will be very welcome or may have information from Mr. C. W. Cotton, 68, Merriens Close, Great Bar, Birmingham, 22A.

THE first anniversary of the Weston-Super-Mare and District A.S. was held recently. Mr. E. Jones of the Bristol club was invited as guest speaker for the occasion, and gave an interesting talk on guppies.

A table show was held for guppies and large cichlids, and a cup for the best guppy in the show was presented by club members Mr. and Mrs. Dennis Quirk, other local clubs being invited to compete. The cup was won by the junior member of the Weston club David Langstone with a scarfed, other guppy awards being 1, 2, and 3 to Mr. F. Brown of Bristol in short-tailed guppies, for long-tailed guppies 1, D. Langstone; 2, D. Quirk; 3, J. B. Evans. The fish were judged by Mr. L. R. Somers of the G.B.S. The result of the cichlids was 1, 2, 3, Mrs. Baines; 4, Mr. S. Clarke. These were judged by the guest speaker Mr. E. Jones.

The club meets the last Tuesday of each month at 7.45 p.m. at the Victoria Bowling club in the Boulevard. Visitors whether residents or on holiday are cordially invited, and an interesting programme for the second year has been arranged.

IT has been proposed to change the meeting night of the Stroud and District A.S. to the second Tuesday of each month commencing Tuesday 14th July. Meetings are held at the Redborough Primary school, Stroud at 7.30 p.m. Inquiries are invited by the secretary, Mrs. J. Jones, The Cottage, Furnace Valley, Blakeney, Glos. Tel. Blakeney 374.

AT a meeting of the Nottingham and District A.S. the speaker was Mr. Manchester who gave a very interesting talk on his fishkeeping experiences under the general title 'My Fishy Past'. The table show month was for pairs breeders or egg-layers. Seven entries were received: the first and second prizes were awarded to Mr. A. Gaskell and the third to Mrs. H. J. Chambers.

THE annual general meeting of the Fancy Guppy Association was held recently in Manchester. Mr. J. Allen, Hon. Treasurer, presented his balance sheet, which showed the Association to be in a very healthy position financially. The main item on the Agenda was to consider a new Constitution, and there were two propositions, one from the Manchester section and one from the Radlett section. After lengthy debate the Manchester proposal was carried unanimously. The election of Association Officers resulted as follows: Chairman, Mr. J. L. Kelly; secretary, Mr. R. Beesford; 99 Valley Road, Arden Park, Bredbury, Cheshire; treasurer, Mr. J. Allen; show secretary, Mr. F. Campbell; assistant show secretary, Mr. J. Brownhill; P.R.O. Mr. V. Farrington; members' representative, Mr. J. Jeffery.

THE Manchester and District Section F.G.A. held their open show recently at which Messrs. Beesford and Jeffery were presented with their Gold Jewelled Guppy, the first to be awarded in the Association. Class winners were as follows: Delatials, Messrs. Beesford and Jeffery; Veiltails, W. Deacon; Fantails, V. Farrington; Swordtails, J. Preston. Colour: J. Kelly; A.O.V. Males, J. Kelly; flags and scarfs, F. Campbell; females, Superba, R. Griffiths; scolopaxids, R. Griffiths; original, R. de Groot; wedgetail, J. Kelly; A.O.V. Female, J. Kelly; matched males, Messrs. Beesford and Jeffery; matched females, R. Griffiths; matched pairs, R. Griffiths. Best male in show, Messrs. Beesford and Jeffery, best female, R. Griffiths; best breeders entry, R. Griffiths. Considering the very inclement weather, the fact that 169 fish were benched showed the tremendous interest in Fancy Guppies in Manchester.

AT a meeting of the Sheffield and District A.S. the first show consisting of three classes, of an annual four show, 12-class inter-society competition between Chapelton Aquarist Society, Mansfield and District Aquarist Society, Workop Aquarist and Zoological Society and Sheffield and District Aquarist Society was held.

The results were as follows: Five egg-laying tooth carp: 1, Mr. Tye (Workop); 2, Mr. Buckley (Sheffield); 3, Mr. Galloway (Sheffield). Breeders (egg-layers): 1 and 2, Mr. Colton (Sheffield); 3, Mr. Crossland (Sheffield). A.O.S.: 1, Mr. Bower (Mansfield); 2, Mr. Sibson (Workop); 3, Mr. Scott (Workop). Points gained for the competition cup to be awarded to the society gaining the highest number of points were Sheffield nine points, Workop six points, Mansfield three points. A recent trip to Dudley Zoo was well supported by members who enjoyed a very pleasant day. Details of the society may be obtained from the secretary Mr. R. E. Galloway, 71, Bent Lathes Ave., Rotherham.

THE Staithes and District A.S. held their first annual show recently. There were 155 entries in the 13 classes and the judges were Mr. G. Holmes, A.Y.A.S. and Mr. A. E. Bruntion, N.F.A.S. The results were as follows: Livebearers: 1, Mr. I. G. Hunt (Tyne-side A.S.); 2, Mr. P. Heron (Peterlee A.S.); 3, Mrs. Cowlam (Middlesbrough A.S.). Barbs: 1, Mr. Firth (Bradford A.S.); 2, Mr. I. G. Hunt; 3, Mr. A. Bailey (Sunderland A.S.). Characins: 1, Mrs. B. Brunt (0); 2, Mrs. E. M. Smith (Staithes D.A.S.); 3, Mr. D. Smith (Tadcaster A.S.). Carps and minnows: 1, Mr. D. Carr (Bradford A.S.); 2, Mr. Clough, Anabannids: 1, Mr. Greenall (Tadcaster A.S.); 2, Mr. Firth (Bradford); 3, Mr. Atherton (Horden D.A.S.). Fighters: 1, Mr. Baxter (Tadcaster A.S.); 2, Mr. Greenall (Tadcaster); 3, Mr. Whitelock (Tadcaster). Cichlids: 1, Mr. E. Motherson (Horden A.S.); 2, Mr. I. G. Hunt; 3, Mr. Firth (Bradford). Catfish and loaches: 1, Mrs. B. Brunt; 2, Mr. D. Robinson (Peterlee A.S.); 3, Mr. Firth (Bradford). Toothcarps: 1, Mr. Greenall; 2, Mr. Whitelock; 3, Mr. D. Smith. A.O.V.: 1, Mrs. B. Brunt; 2, Mr. I. G. Hunt; 3, Mr. D. Carr. Coldwater: 1 and 2, Mr. W. Cowlam (Middlesbrough); 3, Mrs. Firth (Bradford). Breeders (livebearers): 1 and 2, Mr. Barnes; 3, Mr. Faircliff (Tadcaster A.S.). Egg-layers: 1, Mr. Faircliff; 2, Mr. Whitelock; 3, Mr. Barnes.

The special Plaque and A.Y.A.S. Diploma for "best fish in show" was awarded to Mrs. B. Brunt for a leporinus (89 points).

THE Newport A.S. held an extraordinary general meeting for the purpose of electing the present chairman, Mr. Ralph Harris, to the position of president. This action was taken as some recognition of the services rendered to the Society by Mr. Harris since its inception nearly two years ago. Mrs. D. G. Morgan was elected to fill the vacancy thus created on the committee, and in the chair was Mr. Colin Salmon, vice-chairman. The meeting was then given a report on awards won by Newport members at the recent open show of the Bristol Tropical Fish Club (Keynsham Branch) which were as follows: A.V. Cichlids: first and best in show, Mr. C. Salmon (brown scara); A.V. labyrinth: first, Mrs. A. James (thick-lip); A.V. barb: second, Mr. F. G. James (schuberti); A.V. egg-layers: second and third, Messrs. N. & N. Counsell (jeed. floridae); A.V. fighters: fourth, Mrs. J. Hobbs (beta sp.).

The Newport society continues to flourish and membership is increasing regularly. New premises are being sought, and any interested persons should contact the secretary, T. G. Wall, 3, Wyverne Road, Newport, Mon.

OWING to the necessary absence of both chairman, Mr. Dennis Johns, and vice-chairman, Mr. Ralph Harris, the May meeting of the South Wales and Monmouthshire Characin Society, under the chairmanship of the treasurer, Mr. Jack Burgess, took the form of a general discussion on characins and other subjects of mutual interest, which proved to be an informative and enjoyable evening.

Amongst the questions put forward for discussion were, "The Cleansing (and breeding) of tubifex worms", "The effect of the exclusive feeding of dried food to the so-called 'fin nippers'", and "The initial problems of obtaining good stock".

Any interested aquarists in the area are cordially invited to bring their questions along for discussion at the meetings, which are held on the third Saturday of each month, at the "Old Arcade Inn", Church Street, Cardiff, commencing at 7.30 p.m.

RECENTLY Tottenham A.S. were hosts to Walthamstow, Bethnal Green and Chingford Societies in a four clubs' table show. Over 90 fish were benched in six classes. This was a very successful combined effort by the four clubs in the first round of the inter-club table shows. The position of the clubs is as follows: Tottenham 27 points, Walthamstow 19 points, Bethnal Green eight points, Chingford 7 points. Discussion on the preparation for a Tottenham open show is well advanced for a show in October.

A CHANGE of secretary is announced by **Aireborough and District A.S.** The new secretary is Mr. R. E. Hampson, The Headlands, Scotland Lane, Heesforth, Leeds.

At the last meeting it was decided to put on a club show in conjunction with Meriton Hospital Flower Show in August. Five members have each donated a cup to be presented annually to the first prize winners of each class.

A day trip will be made shortly to Chester Zoo.

A CLUB has been formed in Seaham, the name of which is **Seaham and District A.S.** The following officers elected were: president, Mr. W. Hutchinson; chairman, Mr. A. Land; secretary, Mr. A. H. Coulson. All communications and enquiries should be forwarded to Mr. A. H. Coulson, 6, Stewart Street, Seaham, Co. Durham. This club is to hold a "one day open show" on Sunday, 13th September, in Rock House Community Centre, Seaham.

AT a meeting of the **Loyne Aquarists**, Mr. W. Barker (Morecambe) gave a slide show on "British Freshwater Fishes". Miss G. Morgan and Miss D. Hunsington have been elected delegates to the "Northern Federation of Aquarists Societies". At the last meeting Mr. W. Barker gave a talk on "Some Unusual Fishes".

NEWS from the **Dundee A.S.** gives the results of the annual competitions and these were as follows: Scott Trophy: 1, Wallace S. Russell 32 points; 2, James McGeoghie 21 points; 3, Albert L. Hastie nine points; 4, Wilson M. Lowdon and John J. McGeoghie eight points. The winners of the individual Trophies were: Bruce cup for guppies: Alex Robertson; Kamahatty cup for chorocins: Andrew Inachi; Small Cup for catfish: Peter N. Greening; Pat Strachan trophy for large cichlids: John J. McGeoghie; Balguy trophy for breeders livebearers: Wallace S. Russell; Balgillo trophy for breeders egg-layers: Wilson M. Lowdon; Montifich trophy for home aquaria: Andrew Inachi; Tayside trophy for member of the year: The winner of this trophy was Albert L. Hastie with 260 points and the runner-up Wilton M. Lowdon with 185 points.

NEWS from the **Bradford and District A.S.** gives the leading positions in the Arthur Thornley trophy as follows: 1, H. Fleischer 21 points; 2, A. Pirih 18 points; 3, J. Holmes 16 points; 4, P. Moorhouse 10 points; 5, J. R. Smith 10 points; 6, J. Hooper nine points.

The results in the A.O.V. tropical class were: 1, C. Holdsworth (*Myxus Pictus*); 2, A. Pirih (*Aetia Patchipinnis*); 3, H. Greenwood (*Kribia Fish*).

The trip to Marine Lane, Morecambe, is booked for 13th September.

RESULTS of the **Llantwit Major A.S.** show were as follows: Siamese fighters: 1 and 2, D. W. Amis; 3, K. Farrant; Labyrinth: 1 and 3, W. D. Songhurst; 2, Mrs. A. James; 4, J. T. Burpwin; Barbs: 1, R. S. Wigg; 2 and 3, R. D. Johns; 4, A. Couch; *Heteromarginatus* and *hyphenteryon*: 1 and 2, D. W. Amis; 3, R. S. Wigg; 4, R. D. Johns; A.O.V. characins: 1 and 3, N. W. Steer; 2, Mrs. A. James; 4, N. Counsell; Guppy male: 1, 3 and 4, R. S. Wigg; 3, J. Sanders; Guppy female: 1, D. W. Amis; 2 and 3, R. S. Wigg; Platys: 1 and 3, R. S. Wigg; 2, R. Harris; 4, C. E. Salmon; Swordtails: 1, D. W. Amis; 2, M. Skitchley; Mollies: 1 and 3, D. W. Amis; 2, Mrs. A. James; 4, R. S. Wigg; Breeders (egg-layers): 1 and 2, D. W. Amis; 3, J. T. Burpwin; 4, C. Lewis; Breeders (livebearers): 1 and 4, D. W. Amis; 2 and 3, R. S. Wigg; A.V. Goldwars: 1 and 3, W. D. Songhurst; 2, M. Johns; Cichlids: 1, C. E. Salmon; 2, D. W. Amis; 3 and 4, R. S. Wigg; A.V. catfish:

1, W. D. Songhurst; 2, R. Harris; 3, R. D. Johns; A.O.V. egg-layers: 1, R. S. Wigg; 2, A. Ibbertson; 3, M. J. Parry; 4, N. Counsell; Breeders (guppies): 1, R. S. Wigg; Furnished aquaria: 1, W. D. Songhurst; 2, R. S. Wigg; 3, J. Sanders; Juvenile class: 1, P. Pemberton; 2, A. Rogers; 3, L. Ibbertson; 4 and 5, M. J. Parry; Plaque for best breeder team: D. W. Amis; Plaque for best egg-layer: W. D. Songhurst; Plaque for best livebearer: R. S. Wigg; Plaque for best jewelry exhibit: P. Pemberton; Plaque for best in largest class: D. W. Amis; Pump for most points in show: R. S. Wigg; Plaque for best furnished tank: W. D. Songhurst; Cup for best guppy: R. S. Wigg.

THE **Prestwick and Bury A.S.** continues to meet on the second Tuesday of the month at the Church House, The Wyde, Bury. There has been an encouraging increase in membership and in recent months the quality of fish presented at table shows has shown a marked improvement.

At the last meeting the table show was for A. V. Tropical (pairs) and was won by Mr. D. Isherwood with a magnificent pair of rosy barbs. Second was Mr. K. Day (swordtails) and third Mr. Huntback (finful barbs). Arrangements are going ahead for the Open Show which will be held in the School of Arts and Crafts, Broad Street, Bury on 25th July, 1964.

THE speaker this month at the **Nottingham and District A.S.** meeting was Mr. Riddle, his subject being the Aquarium Alphabet. Several interesting and controversial aspects of the hobby were covered. Everyone present both the experienced aquarist and the newcomer learned many tips which should prove invaluable in the future. Mr. Dewick the treasurer gave a hearty vote of thanks to Mr. Riddle on behalf of the members. The winners in the table show of labyrinth and rasboras were: 1, Mr. E. Smith; 2, Mrs. I. Bulleyment; 3, Mr. C. Hill. The raffle donated by the president, Mr. Lynn, was won by Mr. H. Bates. The Pond and Home Aquaria competition held recently resulted as follows: Pond: 1, Mr. A. Adcock; 2, Mr. C. Hill; Home aquaria: 1 and 2, Mrs. Wood; 3, Mr. Britan; 4, Mr. Bulleyment.

THE **Riverside A.S.** held their annual show recently and the results were as follows: Swordtails: 1, Mr. Zurrmble (Uxbridge); 2, Mr. R. Monger (Riverside); 3, Mr. and Mrs. Johnson (Riverside); 4, Mr. A. Nodley; Platys: 1, Mr. F. Watts (High Wycombe); 2, Mr. C. Buckland (Riverside); 3, Mr. B. Baker (Uxbridge); Mollies: 1, Mr. S. Harmon (Riverside); 2, Mrs. P. Bone (Chelsea); 3, Mr. B. Baker (Uxbridge); 4, Mr. D. Ellis (Kingston); Barbs: 1, Mr. F. Watts (High Wycombe); 2, Mr. D. Woodward (Hounslow); 3, Mr. H. Webb (Hounslow); 4, Mr. P. Bough (Riverside); Rasboras: 1, 2 and 3, Mr. R. Biggs (Riverside); 4, Mr. R. Thompson (Riverside); Labyrinth: 1, Mr. R. Cleveland (Riverside); 2, Mr. C. Buckland (Riverside); 3, Mr. E. Daynes (Riverside); 4, Mr. D. Biggs (Riverside); Fishers: 1, Mr. A. Welsh; 2, Mr. R. Forder (Uxbridge); 3, Mr. G. Jennings (Harestead); 4, Mr. E. Daynes (Riverside); Cichlids: 1, Mr. D. Woodward (Hounslow); 2, Mr. R. Forder (Uxbridge); 3, Mr. F. Watts (High Wycombe); 4, Mr. A. Nodley; Characins: 1, Mr. F. Watts (High Wycombe); 2, Mr. B. Bout (Hounslow); 3, Mr. R. Monger (Riverside); 4, Mr. E. Daynes (Riverside); Corydoras cat: 1, Mr. D. Woodward (Hounslow); 2, Mr. and Mrs. Johnson (Riverside); 3, Mr. R. Thompson (Riverside); 4, Mr. R. Biggs (Riverside); A.O.V. cats: 1, Mr. and Mrs. Johnson (Riverside); 2, Mr. M. Richardson (Riverside); 3, Mr. C. Hull (Uxbridge); Egg-laying toothcarps: 1, Mr. R. Cleveland (Riverside); 2, Mr. R. Monger (Riverside); 3, Mr. A. Welsh; 4, Mr. H. Webb (Hounslow); A.O.V. tropicals: 1, Mr. F. Watts (High Wycombe);

2, Mr. D. Biggs (Riverside); 3, Mr. R. Monger (Riverside); 4, Mr. R. Cleveland (Riverside); Breeders (egg-layers): 1, 2 and 3, Mr. R. Yesley (London Transport); 4, Mr. R. Monger (Riverside); Breeders (livebearers): 1, Mr. D. Biggs (Riverside); 2 and 3, Mr. R. Yesley (London Transport); 4, Mr. D. Woodward (Hounslow); Guppies—staged by F.G.A. by Mr. Chas. Macrae; Best male: Mr. Stonelake, delatani (Willesden); Best female: Mr. R. Thompson, half black (Riverside); Best breeders: Mr. E. Daynes, females (Riverside); The Challenge Shield was won by Riverside A.S. for the second year in succession.

AT the sixth annual open table show of the **Skipton & District A.S.** awards went to competitors in the twenty one classes as follows:

Guppies: 1, 2 and 3, Mr. Wolstoncroft (Heywood); 4, Mr. Wilson (Bradford); Swordtails: 1, Mr. Myrescough (Accrington); 2, Mr. Lewis (Burnley); 3, Master Bone (Nelson); 4, Mr. Gaffney (Heywood); Mollies: 1 and 2, Mr. Davies (Derby); 3, Mr. Priestley (Halifax); 4, Mr. Wilson; Platys: 1, Mr. Yeaton (Aireborough); 2, Mr. Baxter (Tadcaster); 3, Mr. Emma (Bradford); 4, Mr. Price (Keighley); Small characins: 1 and 3, Mr. Mills (Meysey); 2, Mr. Gregory (Osram); 4, Mr. Stamper (Meysey); Large characins: 1 and 3, Mr. Davies; 2, Mr. Hunt (Tynning); 4, Mr. Hampson (Aireborough); Rasboras, danios and minnows: 1, Mr. Davies; 2, Mr. Ashworth (Osram); 3, Mr. Whiney (Accrington); 4, Mr. Casey (Heywood); Small barbs: 1, Mr. Hampson; 2, Mr. Stamper; 3, Mr. Price; 4, Mr. Storey (Skipton); Large barbs: 1, Mr. Davies; 2 and 3, Mr. Hunt; 4, Mr. Mills (Nottingham); Sharks and flying foxes: 1, Mr. Wilson; 2, Mr. Hooper (Bradford); 3, Mr. Lewis; 4, Mr. Schofield (Nelson); Fighters: 1, Mr. Whitelock (Tadcaster); 2, Mr. Baxter; 3, Mr. Whitelock; 4, Mr. Stamper; A.O.V. anabantids: 1, Mr. Duckett (Skipton); 2, Mr. Holdsworth (Bradford); 3 and 4, Mr. Wilkie (Sunderland); Catfishes and loaches: 1, Mr. Wilson; 2, Mr. Hanson (Keighley); 3, Mr. Gorton (Accrington); 4, Mr. Holdsworth; Angels: 1, Mr. Hooper; 2, Mr. Myrescough; 3, Mr. Gorton; 4, Mr. Lewis; Dwarf cichlids: 1, Mr. Hooper; 2, Mr. Thomas (Burnley); 3, Mr. Hampson; 4, Mr. Wilkie; A.O.V. cichlids: 1, Miss Davies (Derby); 2, 3 and 4, Mr. Hunt; Cypripodons: 1, Mr. Whitelock; 2, Mr. Eden (Barnoldswick); 3, Mr. Lewis; 4, Mr. Davies; A.O.V.: 1, 3 and 4, Mr. Davies; 2, Mr. Mills; Breeders (livebearers): 1, Mr. Davies; 2, Mr. Wolstoncroft; 3, Mr. Thomas; 4, Mr. Wilson; Breeders (egg-layers): 1, Mr. Baxter; 2, Mr. Davies; 3, Mr. Williams (Osram); 4, Mr. Emma; Goldfishes: 1 and 2, Mr. Hunt; 3, Mr. Wilkie; 4, Mr. Hanson; Best fish in show: Mr. Duckett. The judging was carried out by Messrs. F. Taylor (Burnley) and F. Cherry (Skipton).

Crossword Solution

P	E	D	I	A	S	T	R	U	M
P	G	C	E	E	E	R			
E	U	G	L	E	N	A	T	R	E
N	I	I	S	S	U	E	D		
C	T	E	M	P	O	R	R	H	E
I	R	E	U	N	O	N	E	D	
L	T	I	D	E	D	A	R	M	
F	A	R	M	R	I	D	E	R	I
I	A	P	A	R	T	A	R		
S	O	S	O	I	S	A	T	S	E
H	R	N	I	P	L				
I	N	T	I	G	E	R	B	A	Y

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It is quite easy to get to Buckhurst Hill. By tube train on the Central Line thirty-five minutes from the West End, and we are three minutes from Buckhurst Hill Station. Or by bus routes 20, 384, 167 to Bald Faced Stag, five minutes walk from there. The Hatchery is closed all day every Tuesday. You can visit on all other days including weekends.

Over 130 different species of fish for sale. Fifty varieties of plants available, collected from our hundreds of tanks for each order and sent direct to you, they cannot fail to grow.

We sell, buy, or exchange fish of any kind. We also purchase second-hand tanks or complete 'set-ups'.

WE NOW OFFER

From our extensive list of plants we offer the following post free.

Twisted Vallis ... Per Doz. 5/-	Indian Fern ... Each 2/-
Portuguese Vallis ... " 5/-	Banana Plants ... " 6/-
Sage Natans ... " 4/6	Water Orchids ... " 6/-
Cabomba ... " 6/-	Cape Fear Spatterdock ... " 6/6
Racopa ... " 6/-	Broad Leaf Amazon Plant ... " 8/6
Hygrophylla ... " 6/-	Cellophane Sword Plant ... " 8/6
Myriophyllum ... " 6/-	Madagascar Lace Plant ... " 15/-
Red Ludwigia Temari ... " 6/-	Aponogeton Undulatum ... " 2/-
Giant Sage ... Each 2/8	Aponogeton Uvacoous ... " 3/-
Water Wistaria ... " 2/-	

WHOLESALE PLANTS S.A.E. FOR LIST

We are now sending fish by Rail, Carriage and Telegram 12/6. Minimum orders £3. Please send S.A.E. for lists.

PLEASE NOTE

The books written by Thos. H. Marshall: 'Breeding the Egglayers', 'Breeding the Livebearers', 'Breeding the Labyrinths', 'Breeding the Cichlids', 'Aquarium Management and Fish Farming', 'Aquarium Plants and Snails', are all available from here at 8/- per volume, post free, or a complete set for 42/6 post paid.

WE GUARANTEE

1. That here you will see a bigger and better display of Exotic Fish than anywhere else in the British Isles, and we do not exclude the Zoo's. The test is to ask anyone who has been here.

2. That our Fish food is the finest obtainable and that it contains a very high proportion of the best liver and young bullocks heart. Sent direct from here so that it is in perfect condition and ensures that it is not adulterated in any way. Your fish deserve the best food you can give them. N.O.F.F. (Nature's Own Fish Food) is the best. Any of the Cichlids eat it greedily. A generous sample will be sent post free for 2/6. Try it and give your fish a real treat. Treble quantity 6/-.

3. That our plants (and we offer over fifty different varieties) are the very best obtainable, and that our 10/- parcel of 30 plants, including Water Lettuce, and the £1 parcel of 40 plants including Spatterdock, Uvacoous, Undulatum, Water Lettuce and Lilies are all post free and the best on offer.

4. That everything we sell is the best on offer. We supply everything for the Aquarist in the way of equipment and post free. Our offer of a Thermostat, Heater and Thermometer at 20/- post paid is still open.

We are always prepared to give advice on all phases of fishkeeping and typical breeding tanks set up for many different species of fish can be seen in our Hatchery. At the moment we can offer Fancy Goldfish. See our other advertisement on page xiii. A stamped addressed envelope must accompany all enquiries, including those for our lists and answers that are required to questions.

Forty years experience at your service. We have been breeding fish since 1920

Nottingham and District Aquarists' Society's

NATIONAL OPEN SHOW

12th-13th SEPTEMBER, 1964

DRILL HALL, DERBY ROAD, NOTTINGHAM

Open 12.30 p.m. — 8.30 p.m. Saturday 12th
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89 Classes Tropical and Cold Water

Cups awarded in every class
Many other prizes

Closing date for entries 29th August

Schedules:

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(Box 35) 31, Brighton Road, Surbiton, Surrey

Telephone: ELMBRIDGE 6783

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that has a table show at every meeting
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to assess your fish for you and put you on the right track?

Then join the **South Midlands Section of the**

Federation of Guppy Breeders Societies

which meets in Birmingham

Write to **Malcolm Delingpole, Willow Croft, Tibberton, Nr. Droitwich, Worcs.** for details. If you live outside this area, we shall be pleased to send you the address of your local section secretary or provincial secretary. There may be one quite close to you.

GUPPY KEEPING, THE MODERN BRANCH OF THE AQUATIC HOBBY!




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PLEASE FEED SPARINGLY
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Fine Breeding size Orandas

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We have been breeding fish since 1920 and our vast experience
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PREPAID ADVERTISEMENTS—continued from page six

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T.P.S. are giving away free equipment, plants and literature. Send
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THE AQUARIST. April 1949 to February 1956. 80 copies. Offers. S.A.E., Wilkinsons, 51, Northwood Road, London, S.E.23.

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continued on page xiii

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