

# The AQUARIST AND PONDKEEPER

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Photo: Birmingham Gazette  
Beneath these stairs in a new school at Birmingham is a large pond for aquatic life. See "Pond 'Below Stairs'" on page 144

## Editorial

SOMETIMES facts about our hobby come to light from most unlikely sources, and frequently the more unlikely the source, the more amusing is the "fact." Take, for example, the comments on judging at fish shows recently published in a paper called *Our Dogs*. Did you know that judges of fishes are always well paid for their labours—so well paid that they can be regarded as professional judges? The authority for this is Mrs. Steve Race, who, says *Our Dogs*, "dropped out of this fascinating game" because white spot "cut the bottom out of the tropical fish hobby generally in this country."

Well, well! The relayer of this information in the doggy paper uses it to contrast the state of affairs at dog shows, where, it is said, large amounts of prize money go to exhibitors and the poor judges (the writer apparently is one) are treated far less favourably. He quotes as concrete illustration the £1,190 prize money at one dog show and the total judges' fees and expenses of £49; no such hard core fact is used to expose the fish judge position, however. We rather fancy that allowing as many as twelve judges at an average fish show to share £49 even with their expenses would make them think that some Rockefeller endowment must have come the way of the show concerned. The writer also appears to admire the American dog show system, where "the 150-dollar fees make the judging a worth-while profession." Our experienced fish judges are numbered among the hardest-worked spare-time enthusiasts we know, and although no one should be complacent about the poor or absent remuneration they receive, we do not get our values twisted.

The truth of the matter is that in fish showing neither exhibitor nor judge expects great monetary reward. Both are enjoying one competitive aspect of their hobby, and the reward comes through this enjoyment. That is the position in the fish world (other papers please copy), and that's the way we like it. If ever our hobby so degenerates as to make it a prize-money-grabbing side-show then we shall have gone to the dogs indeed.

# Golden Tench

**T**HIS fish is one of the most handsome of the cultivated fishes. The ordinary green tench is well known and the golden tench is a development from it. In shape it follows the tench outline but instead of the usual green colour the fish is a golden yellow all over. This colour should be free from small black spots or blotches, but as with the golden orfe this is a fault which often develops with this variety.

For show purposes under Federation rules the body should be covered with small, inconspicuous scales and the upper profile should be gently arched. The lower profile is somewhat more shallow. This shallow or straight underneath can be almost an in-curve in some tench; in fact many fish are spoilt by what appears to be a sure sign of starvation, by showing this hollow belly. The body should be quite thick and from the front show an oval shape. The iris of the eye is ruby red. The fish must have one pair of barbels under the mouth. The dorsal fin should be in the middle length of the fish and be high, rounded and held erect.

The caudal fin or tail should be as deep as the body with only a slight notch or fork, and it must be carried well spread. The pectoral and pelvic fins are also well rounded and no fin should be pointed. The anal fin is similar in shape to the dorsal. I have noticed that male tench have the outer rays of the pelvic fins very much thickened and the fin is almost spoon-shaped. I remember several years ago I exhibited a fine home-bred tench which was a male, and this fish showed the curved, thickened pelvic fins. The judge said that the fins were mal-formed and passed it by!

For show purposes the fish should be six inches in body length, and this body receives a maximum number of 20 points. The colour can get 30 points, 10 each for condition and deportment and the rest of the 100 for finnage and barbels. Unless a tench has been well fed and is in good condition it will not be likely to get a prize at any fair-sized show. Nothing looks worse in a show tank than a hollow-bellied, half-starved fish. The clear golden yellow colour is not easy to keep on a fish as it gets older, as the undesirable black has a tendency to develop as the fish matures.

Golden tench are very handsome fish for the pond or tank, but once they get over six inches long overall I think that they are happier in a pond. They are not very fussy over foods but prefer some form of live food. Water snails

and other live foods form their diet in nature but they will take bread and the usual goldfish foods. Being so fond of garden worms they may soon be tamed and will then come to the side of the pond to take them from the fingers. As they are mostly bottom feeders they make very good scavengers and, as a matter of fact, I prefer them in an aquarium to cat-fish for this purpose. At least I have never found them to be fin-nippers, which is more than can be said of the cat-fish.

The tench is often referred to as the "doctor fish" but this is not true. The slime of the fish has no curative powers, but the mere fact that this fish can eat up much of the uneaten food in a tank or pond means that it can have a very beneficial effect on the conditions. Although tench can live in very murky water they will soon die in a tank which becomes too warm, especially in thundery weather. They are not difficult to breed in a medium-sized pond and they spawn generally late in the season, say July, and follow the methods of goldfish. The eggs are very similar but the fry are rather longer and thinner than those of goldfish. Some green tench I bred some years ago bred themselves when they were only two years old. To rear them the same methods can be adopted as are used for rearing goldfish, but plenty of live foods must be included in the diet.

A. Boarder

## Miami Aquarium

**C**ONSTRUCTION of a circular channel to contain large sea specimens is under way at Virginia Key in Miami as part of a \$1,000,000 aquarium project.

Sunfish, which attain a weight of two tons, manatees, manta rays and other marine life will be stocked.

The circular channel, eight feet deep, will be 248 feet in diameter. Spectators will stand on outer banks, or on an island in the middle. A crustacean pool system in a natural mangrove setting will have turtles, crabs and other shellfish. Inside the main building will be a circular tank 87 feet across, with viewing ports in the sides.

Plans call for completion of the circular channel by 10th November. Operators expect to have this stocked in time to open the aquarium partly for the coming winter season.

—New York Herald Tribune

## FRIENDS & FOES No. 29

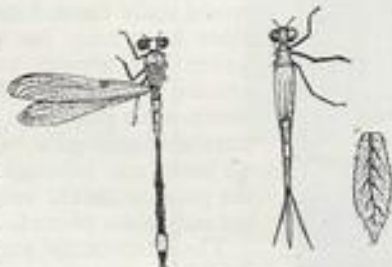
### ZYGOPTERA

**PHYLUM:**—Arthropoda, from Greek *arthron*—joint, and *podos*—foot.

**CLASS:**—Hexapoda—from Greek *hex*—six, and *podos*—foot.

**T**HE damsel flies are actually a sub-order of Odonata, and comprise seventeen British species. They are slim bodied, gossamer winged, and much in evidence throughout sunny days in the summer months. Females can frequently be seen at such times resting lightly on a lily pad, or other floating aquatic, with body curled into an inverted "u" as she seeks a likely spot to lay her eggs, which are placed singly in minute clefts in the plants.

When the eggs hatch the most noticeable features of the extremely small larvae are an enormous pair of com-



*Ischnura elegans*. Left, adult; centre, nymph; right, larval abdominal appendage (the "gill leaf") magnified

pound eyes, and three flat, leaf-like extensions at the end of the abdomen. These are used as gills, and also as a means of swimming and warding off un-

## Damsel Flies

welcome visitors. I have watched captive nymphs pushing each other away by bending their bodies and using the appendages as one would a broom. Food consists of any live creature small enough to seize in the "grab," or mask, which is shot forward in exactly the same way as the closely related dragonfly nymphs.

This creature is not, in my opinion, a serious menace to our fishy friends, and, indeed, is eaten by quite a few long before it reaches maturity. The flies add beauty to our summer scene, and should be left alone. Birds, beetles, frogs, spiders, water fowl, and many other creatures prey upon them, and need no help from us.

C. E. C. Cole

THE AQUARIST

# Overdoing the Aquarium "Keeping"

by WALTER BERTHOLDT

THERE is no doubt about it—we aquarists love our hobby. And for the real fish hobbyist aquarium-keeping means more than a mere pastime, it is an eternal source of recreation and joy. It is an ideal counterpoise to the nervous haste and eternal fear of our atomic age; a peaceful and quiet haven where we find a still refuge from the troubles and worries of the everyday "fight of life." We like poking here and there in our "underwater garden," just as the garden fan loves being busy in his spare time between his flower and vegetable beds. All this is good and even useful, but I would like to address here the zealots of our hobby, those who are overdoing it, or, in other words, who have become a slave to their fishes.

Now, you are perhaps smiling, dear reader, and you will say, "that cannot happen to me!" Well, I admit most of us are not subject to this kind of "slavery." But there is a legion of aquarists who could be happy husbands if they were not married to their fishes. That tragi-comic expression "fish widow" is the right word for a lot of unhappy fish fans' wives, whose spouses are making their "better halves" nervous by their eternal poking in their tanks and, consequently, the too numerous drops of water on the well-waxed floor and the good carpet.

## Examples of Overdoing

Just some examples for better illustration. Let us begin with the siphoning of aquaria. I know hobbyists who are not satisfied if they cannot siphon off the fish and snails' excrement at least three times a week. At least, the beginners in fish-keeping are very prone to this foible. But they forget that just these droppings are the best fertilisers for a luxuriant growth of aquatic plants, once these waste products have penetrated the gravel. Siphoning every fortnight or even once a month is fully sufficient in a tank which is not overcrowded. An exception is uneaten, decomposing food in aquaria where no scavengers are kept. Such particles should, of course, be removed frequently in order to avoid putrefaction in the tank and its consequence—polluted water.

A good friend of mine feels irritated when he discovers a yellow leaf of *Vallisneria* in his tank. Instead of sitting in peace in front of his tank watching the little paradise of happy fish and lovely green plants, there is itching in his finger-tips. He rises from his comfortable easy chair, uncovers the aquarium hood, takes a pair of scissors and cuts off the dead leaf. But he is unaware of the fact that he is thus depriving his snails of one of their favourite foods—decomposing aquatic plants. No wonder that his snails are underfed. Their shells have white spots and the once deep red of their body is turning more and more pale, and, even worse, many of them are already dead and their empty shells are lying on the ground. Therefore, don't overdo the trimming of decaying small parts of your plants; leave that to your scavengers, as otherwise there is a danger of their becoming out of work.

But back to our friend. He has just finished clipping off



Photo:

A. C. Toms

Before the aquarium has long been set up and is well established there is a tendency to interfere needlessly with natural processes

the yellow *Vallisneria* leaf and is sitting again in his arm-chair. But only for five minutes. Then he suddenly finds that the lovely rock scenery in front of the *Ludwigia* group would give a still better effect if skilfully arranged round his beautiful *Nuphar*. For a further minute he is innerly fighting in despair between the fulfilment of his sudden idea and the accusing reproach in the eyes of his wife. But then he rises again, resuming his poking. And only after a full hour, when the tears and an outburst of his spouse are definitely convincing him that this is the end of a "nice evening," he becomes aware that it is now time to go to bed. But even worse, now he sees that the new "rock fence" round the *Nuphar* does not convince him at all in its effect, and that the former group in front of the *Ludwigia* terrace gave a far better scenery. But now it is too late for to-day. Unsatisfied he goes to bed too, and tries in vain to convince his grumbling wife that his only desire is to achieve his idea of the perfect tank. But he does not see that by messing in his tank too much he is removing more and more from his aim of reaching the ideal aquarium.

## Tranquil Observation

These unhappy fellows are never satisfied. And that's what our hobby should give us: a well-balanced mind, recreation of the body and the soul. All this we can find in our hobby if we only understand how to enjoy, in tranquillity and happy watching, the beautiful and aesthetical harmony of a well-balanced tank in which sappy green aquatics are growing and happy fishes are swimming. It is the same with human beings as with fish and plants: if they are disturbed too much they do not prosper. Let the aquatics develop of their own accord. Give them sufficient light, a healthy gravel ground well saturated with fish and snail droppings, and a sound water. Then you will see that they will reward you by a sound growth.

There is an endless chain of things that are overdone in aquarium keeping. Think of the thermostats that are keeping the aquarium temperature on a constant level of perhaps 76 degrees. Where do we find in open nature a water, for instance, where the temperature is always the same? Nowhere! Exact measurements in the native haunts of our tropical fish resulted in the finding that there are almost everywhere differences in temperatures between the upper and the lower levels of the water of up to 20

degrees. And the fishes feel very well in such waters.

I, myself, have neither a filter nor aeration in some of my tanks. In such a 50-gallon tank which is lighted and heated by three 40 watt bulbs suspended in the water, I have measured temperature differences in the different levels of the water of 10-20 degrees. And the fishes in this tank (neons, glowlight tetras, *Aphyoseion* species, *Ambassis lala* and *Nannostomus* species) are perfectly healthy and are moving in all levels of the water. I had no maladies in this tank for years and I had to remove the fishes from the tank only when they had reached an old age, but not for chills or swim-bladder trouble or other casualties. It has been proved again and again that fishes that are kept in too high and too even temperatures are much more sensitive to maladies than fishes that are not living in overheated tanks with constantly controlled even temperature. On the other hand I admit that a thermostat is necessary in breeding tanks, where young anabantids are reared for instance. But in the usual show tank it is not required.

Another example of overdoing is the abuse of all kind of chemicals and tablets as water purifiers, fertiliser tablets, antibiotics, etc. Very often such an enriching of the aquarium water with mineral salts and other elements has

the consequence that just the opposite is reached to that we are striving to obtain, viz., a healthy tank. No wonder, therefore, that in such aquaria neither fish nor plants are thriving. And here again an example. A few years ago I had one of my show tanks densely planted with groups of *Ambulia*, *Ludwigia*, *Nuphar* and *Myriophyllum*. The scenery was very nice and the plant growth satisfactory in every respect. But I was not yet satisfied; I wished to obtain an even more luxuriant development of the plants. So I enriched the water and the gravel ground of the tank with fertiliser tablets. But I was prudent. I took only half the dose the manufacturer of the tablets recommended.

In the first days after the experiment nothing happened. But after one week there came a standstill in the growth of the *Myriophyllum*, *Ambulia* and *Ludwigia*. Only the *Nuphar* was unaffected. And it took the plants nearly three months until they began growing again. The experiment was made in the month of May, when I always had a maximum growth of my aquatic plants.

In conclusion, this is my good advice to readers: if things are well in your tanks, let well enough alone! We can only reach our aim of the perfect aquarium by not interfering too much with it.

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## Colour and Sex Change

by A. VERNON ASHFORD

FOR some time now it has been common knowledge that the colour is gradually disappearing from our guppies, and methods have been suggested to counteract this failing. In fact, I tried to obtain colour by selective breeding, but with little or no result with my veiltail guppies. However, during the last nine months I have not only obtained well-coloured fish, but also a change of sex.

Some months ago, Mr. Esterbrook of Leicester, came to judge a guppy table show at Northampton and was surprised to see such a fish, and admitted that he had not seen this type of fish before. How has this come about? Taking our own bodies for an example, all the carbohydrates in the world will not produce healthy bodies, because when cellular tissue breaks down, proteins of the right type are essential to bring back colour and vitality. Due to wartime diet the intake of protein to-day is not adequate for most people. Hence we are faced with anaemia, loss of weight, slow wound healing and less resistance to certain diseases. Thinking like this gave me a clue to the poor colour of my guppies. The problem now was, do fish respond like humans?

Now to get the proper assimilation of protein a little carbohydrate is essential. Taking Bemax as 50 per cent. carbohydrate and 27 per cent. protein this can become a basic food. It will be seen that Bemax would be a much better fish food if the quantities for the carbohydrates and proteins were reversed. The next thing to do is to more than double the protein content by the addition of dried meat. Brewer's yeast was also added in the form of crushed "Vetzeme" tablets to aid digestion.

Fish were fed upon this for several months, resulting in healthy and large guppies. The colour was only a little better and not brilliant. What else could be done? Knowing that protein absorption would be assisted by adding hormones I decided to experiment with the guppies which I did not consider worth keeping. Four dozen were placed in a separate tank and fed continually on hormone food. It

consisted of my standard food mentioned above with the addition of ethinyloestradiol (female hormone) and methyltestosterone (male hormone) called under the trade name "Mixogen" by Organon Laboratories Ltd. Within a few weeks all the grey-coloured females had colours of red, yellow, blue and green, also all of them had grown a gonopodium. The so-called change of sex I did not expect, but it was quite a novelty to see large female cum male fish with such bright colours.

I am not prepared to say that the fish have changed their sex but they have bi-sexual features. By altering the proportion of the male and female hormone in the diet the possibilities are enormous. For example, a female was fed with female hormone only and every one of the fry turned out to be female; another had the male hormone and out of 40 fry 38 were males. Once the colour is obtained only occasional feeding of the hormone food is essential, alternated with your own popular food. To make sure that the fish have the hormone it has to become mixed within the food, not just minute powdered particles, so that every bit of food contains hormone. In other words, the Bemax, meat, Vetzeme and hormones become one food.

FOR the benefit of readers new to the effects of hormones on fishes, it is considered advisable to add a note of caution concerning the use of these compounds. Firstly, although secondary signs of maleness in a female fish can be produced by administering "male hormone," that is, heightened coloration and growth of a gonopodium, it is usually considered unlikely that the fish is capable of normal reproduction thereafter. In a letter received since the above notes, Mr. Ashford tells us that some of his females showing changed characters have produced fry. It is certain that such fish cannot act as males, that is, hormone treatment cannot induce functional testis growth in a female fish or an egg-producing ovary in a male fish. This brings us to the second point to note, which is that hormone treatment frequently leads to the production of sterile fishes, male hormone suppressing normal ovarian development and female hormone antagonising testicular growth. Genetically-determined females, therefore, although appearing as large and colourful males by this method, are likely to be interesting freaks rather than useful material with which to establish a breeding strain.—EDITOR.

## The Giant Danio

(*Danio malabaricus*)

ORDER:—Ostariophysi, from Greek *ostarion*—a little bone and Greek *physis*—bladder.

FAMILY:—Cyprinidae, from Greek *kyprinos*—a kind of carp.

SPECIES:—*Danio malabaricus*, from Dhani—a native name, and malabar—Malabar, plus Latin *icus*—belonging to.

THE giant danio is quite definitely not the fish for an 18-inch aquarium, unless a very small specimen. Growing as it does to a maximum of nearly four inches, and being an intensely active species, it requires room to stretch its fins. I suggest, therefore, a minimum-sized aquarium of three feet. Such a container, furnished tastefully with plants such as *Vallisneria spiralis*, *Ambulia*, *Cabomba*, *Bacopa*, and one or two *Cryptocoryne*, will provide a beautiful home for half-a-dozen of these striking creatures—a home, moreover, in which it is possible more easily to breed them.

No uncoloured photograph or black-and-white drawing can do justice other than to their symmetrical and streamlined shape. Normally the basic body colour is blue (paler than the blue of the zebra danio), upon which is superimposed narrow longitudinal bands of pale yellow. Just behind the opercula are a few short vertical yellow bars. The mature female bars are often more broken than those of the male. Fins tend to be reddish, particularly during the



Photo:

Giant danio

L. E. Perkins

breeding season, and at this time the male develops an intense reddish ventral surface, starting from above the pelvic fins and continuing backwards into the lower rays of the caudal fin. A fully grown male frequently develops what appears to be a double chin. This is actually a slight protrusion of the lower jaw.

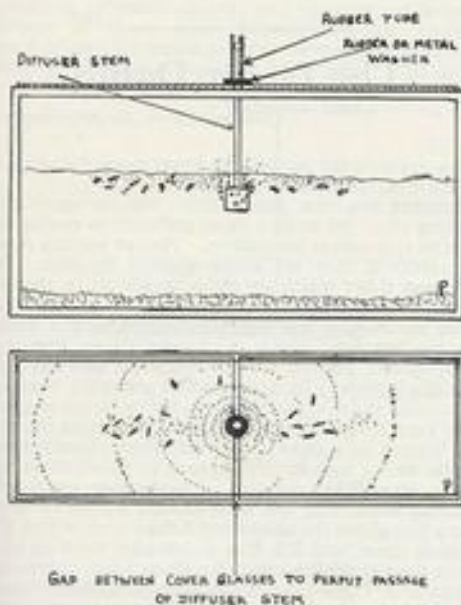
The temperature tolerance of giant danios is good. They are happy in water from 67° to 82° F., and happiest where they are subjected to the full range every two or three days. This fluctuation of temperature, if not too rapid, serves to harden the fishes and keep them lively and healthy. Normally not fussy about food, they can be persuaded to partake of any of the usual dry or live foods. If duckweed is floating on the surface water they will feed on the roots and keep them short.

It is best, however, if it is intended to breed the fishes, to feed them liberally on live foods for a week or two beforehand. This will ensure them being in tip-top condition. Raise the temperature to the higher seventies and maintain it there. Often the female is ready before the male and when this is the case, she will nudge him and half drive him round the aquarium in an endeavour to stimulate him into returning her advances. He soon catches on, and there ensues a mad chase in and out of the thickets of fine-leaved plants. Accounts differ as to whether the eggs thrown are adhesive or non-adhesive. In either case the plants catch and hide them from the attentions of the breeding fish, which should be removed when the females are spent. The eggs are about a millimetre in diameter, and very transparent. They hatch in about 30 to 40 hours at 75° F. and about three to five days in lower temperatures.

Fry are extremely small and like minute glass splinters. Colour pigment begins to develop when the fry become free-swimming. They frequent the top of the water, feeding upon Infusoria, which is usually most abundant just below the surface, as anyone who has examined a culture will know. Powdered egg is a good substitute for Infusoria, particularly if it is present in the water as a cloud of particles which are kept on the move by slight aeration, arranged as in the diagrams.

After about a week of this feeding, growth should be obvious, and newly hatched brine shrimp can be introduced. Follow with the usual graded sizes of live foods, and add powdered Bemax to supply the essential vegetable bulk. Do not allow uneaten portions of food, either vegetable or meaty, to accumulate on the bottom of the aquarium. Apart from being unsightly, these decaying particles are

(continued overpage)



Diagrams showing the use of an aerator diffuser to keep powdered food particles moving for fry consumption

## AQUARIST AT HOME:

# Mr. Deryk Hawkes

(MARCH, CAMBS.)

Interviewed and photographed  
by ROY WHITEHEAD

THE home-built lean-to fish-house, owned by Mr. Deryk Hawkes is 9 feet by 8 feet, is of timber and asbestos-cement sheet construction, lined internally with hardboard, and well lighted by two windows and the half-glazed door. The majority of the 21 tanks are set up in the furnished style and range in capacity from seven to 35 gallons. All the tanks are heated by electric immersion heaters, and electric lighting is used throughout. Many of the lighting shades are home made but Mr. Hawkes has found it more convenient to buy his tank frames ready-made and glaze them himself.

With an eye to economy, one bank of eight tanks has been enclosed by neat hardboard panelling and the space between tanks and hardboard filled with sawdust for insulation purposes. During the very coldest weather an oil-burning stove is used to avoid undue strain on the heaters. The largest tank is used as a tropical community aquarium and is remarkable for the fine quality of the plants, particularly one magnificent Amazon sword (*Echinodorus intermedium*), and a giant specimen of *Vallisneria* with leaves about five-eighths of an inch in width and nearly nine feet in length. Most of the aquaria are well-planted, and planting technique is relied on rather than rockwork in achieving a natural effect. At the moment Mr. Hawkes is specialising to some extent in the *Cryptocoryne* species, and believes that a certain amount of natural daylight is necessary for the natural and healthy development of the plants.

Mr. Hawkes also has two shallow garden pools in use, the larger, 8 feet by 4 ft. 6 ins., is occupied by golden orfe and goldfish; the smaller, 6 ft. 6 ins. by 2 ft. 6 ins., is used for breeding guppies and paradise fish (*Macropodus opercularis*) each year from June to September. The ponds are of concrete construction with dwarf half-brick surrounds.

Most of those tropical fishes that are now readily obtainable are kept in the fish-house; the identification of one small silvery fish about three inches long housed in the tropical community aquarium stumped the writer, however, and his chagrin can be imagined when told it was a young dace (*Leuciscus leuciscus*). It was caught when in the fry stage and has lived happily in the tropical tank ever since!

Breeding activities have so far been confined to *Brachydanio rerio*, *Danio malabaricus*, and several of the *Barbus* and commoner livebearing species in addition to guppies and paradise fish mentioned previously, but it is hoped to double the size of the fish-house this year, thus making room for many more tanks for breeding purposes. The tropical tanks are kept at a temperature of about 78° F. and aeration is used for the breeding and rearing tanks. Natural live foods are used when obtainable, otherwise chopped earthworms, white worm and prepared dry foods are used.

In common with many other fishkeepers, Mr. Hawkes is keenly interested in the culture of cacti and has been successful in growing many types from seed. At one time he was the proud owner of over 100 named varieties; most unfortunately, however, the combination of the severe frosts experienced earlier this year and a greenhouse heating failure resulted in the loss of many valuable specimens.



Mr. D. Hawkes by his fish pond, which is situated at the side of his fish-house

Mr. Hawkes was, to a large extent, responsible for the formation of the March and District Water Life Club, of which he is chairman. During his seven years' experience in fishkeeping, he has exhibited at many local shows and possesses numerous prize cards illustrating his successes in the competitive field.

## The Giant Danio

(continued from the preceding page)

breeding grounds for bacteria, and may cause pollution and the death of all the fishes in the tank.

Remember too, that giant danios require space above everything else; try to give them sufficient to enable them to exercise themselves adequately. No one expects dogs to keep healthy if they are never allowed freedom. Why then, expect fishes which are normally always on the move to remain strong if they cannot move freely?

*Danio malabaricus* was extensively kept in this country before the last war, and it is pleasant to see that it has returned within the last four or five years and has a new coterie of admirers. Its activity does not make it an ideal fish, from the judge's point of view, for inclusion in exhibitions. Yet a judge who found a giant danio lying immobile at the bottom of a show tank would immediately wonder what was wrong with it. All aquaria in which these fishes are kept should be covered. I remember once, when purchasing some, that one shot straight up in the air for almost a foot above the uncovered Kilner jar in which I was examining them, and fell with a sickening thud on to the concrete floor of the fish house, knocking itself unconscious. Subsequently, I heard that it recovered completely from its fall, which led me to the conclusion that nature having given them the power to make prodigious leaps also endowed them with the toughness to withstand damage from the inevitable falls that followed the exercise of their leaping powers!

# Microscopy for the Aquarist

**A**QUARISTS everywhere are manifesting an increasing interest in microscopy. Many have already purchased an instrument and others are contemplating investing in one. In the hands of one who knows a little about the subject a microscope is a thing of joy, increasing interest and enjoyment of the hobby very considerably, but used by someone unaware of how to obtain the best from his purchase it might easily become considered a useless encumbrance.

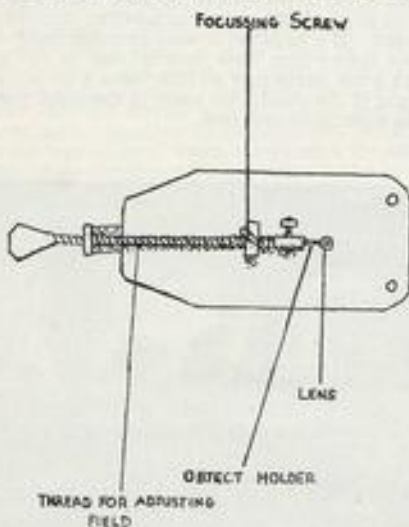
Several of the aquarist societies which have bought a microscope for the use of their members have discovered too late that careless handling of a precision instrument—for a microscope is nothing if not this—can result in costly and sometimes irreparable damage. A single club evening devoted to a lecture and practical demonstration of how to use a valuable asset might well have saved a great deal more than its cost.

It is with the object of providing a basic knowledge of the theory and practice of microscopy that this series has been compiled. I have done my utmost to dispense almost entirely with technical terms, reducing them wherever possible to the language of everyday life. Nevertheless, if in spite of my efforts something is not explained sufficiently, or an important omission made, I shall be pleased, with the Editor's permission, to deal with difficulties in a "Q. and A." section at the end of each article. (Letters should be addressed to me c/o *The Aquarist*.)

I am starting right at the very beginning, and assuming that no one already knows anything about the subject.

## Starting at the Beginning

What is microscopy? Microscopy (the word) is derived from two Greek words—*mikros*, meaning "small," and *skopein*, meaning "to look at." Thus microscopy is the examination of small objects, and examination is greatly facilitated if those small objects can be magnified. Magnification—the making of an object appear bigger than it really is—is achieved by means of a lens. The simplest



One of the simple microscopes used by van Leeuwenhoek in the early eighteenth century

The first of a new series of articles describing the use of lenses and microscopes as an introduction to aquatic biology

by C. E. C. COLE

kind of lens, known to everyone, is the pocket lens, burning glass, reading glass, etc. These are invariably made of glass nowadays, but through the ages many materials have been tried—rock crystal, rubies, emeralds, and even water. Yes, way back in the 18th century a Mr. Stephen Gray invented a water microscope, utilising drops of water in a ring as lenses. It worked, but was so awkward and difficult of operation that it was not adopted enthusiastically. You can try it for yourselves by placing a drop of water in the spring end of a safety pin, and holding it near to these pages. At the correct distance a magnified, but badly distorted image of a tiny section of print will be seen. A little too near, and the lens will be left on the page!



Shapes of various lenses used singly or in combination in modern microscopes

In a microscope to-day, various combinations of flint and crown glass are used, although for special work fluorite is sometimes employed. Worth mentioning, though hardly likely to be encountered or used by the aquarist, are the amazing electron microscopes, which dispense with material lenses and substitute magnetic fields *in vacuo*.

A microscope which employs only one lens, or a combination of lenses which act as one, is termed a "simple" microscope. These are not much used to-day, except for low magnification work in dissection microscopes (of which more later).

## Simple and Compound Microscopes

Nevertheless, much good, sound work has been done with simple microscopes. Perhaps some of the most valuable observations ever made were those of Anthony van Leeuwenhoek, a distinguished Dutchman, who lived in the years 1632-1723. Using tiny lenses in a very crude but ingenious instrument he was able to describe red blood corpuscles, stunning the medical world of his era. Other contributions he made to our knowledge were of bacteria and Infusoria.

Undoubtedly a "compound" microscope is the instrument you will buy. These instruments employ two lenses or systems of lenses. The first system projects an image of the object under observation, which is further magnified by the second system of lenses. This image is upside down—the left side of the object being to the right and the top at the bottom—a very puzzling thing to get used to at first. Why this image is inverted, how it is magnified, and how light affects the operation will be discussed next month.

## In the Water Garden in OCTOBER by *Astilbes*



Photo:

Flowers of the water hawthorn

E. Perkins

**D**URING this month your activities with the water garden are going to be more concerned with clearing up than with actual plant growing. Many of the water plants will have started to die back and the water lilies are sure to be among the first to show signs of decay. I always find it a good plan to remove all flower heads once they have closed for good. After a time the rest of the stem may be pulled off so that no more decaying vegetation is left in the pond than can be helped.

Now that flowering has ceased it will be noticed that many of the leaves will turn yellow and die. If your pond is not over large and you have a fair number of fishes therein, I advise you to remove these decaying leaves with as much of the stalk as possible as the waste matter will only cause pollution. On the other hand it must be realised that in a fairly large pond some of this decaying vegetation may be necessary for manure for the following year. Use your own judgment as to how much is removed but take out a little too much rather than not enough. The plants will be resting all the winter and so cannot use up any of the waste matter in the pond. It will be in the spring when the question of manuring will be of more importance.

You may have taken note of some special water lilies for planting next spring. I have been noting down some very

fine growers, and for those with a medium-sized pond the *N. marliacea* types are especially good. There are several varieties of this species and they all appear to me to be ideal for ponds of about eight feet across and up to 20 feet across. The foliage is generally of a medium size and some varieties have dark red leaves which make a grand foil to the flowers. *N. marliacea albida* has white flowers which are nicely scented, with flowers raised quite high above the water. *N. marliacea rosea* is a beautiful variety, bearing many deep pink flowers which are very fragrant. *N. marliacea carnea* is another handsome variety with a deep pink petal; a good grower with fine foliage. *N. marliacea chromatella* has a real yellow flower with a large group of yellow stamens to add to the beauty of the flower. The leaves of this plant are mottled green with dark red. Another variety of this species is *N. marliacea ignea* with good-sized flowers of a carmine tint, a startling plant with brownish markings on the leaves.

It can be seen that there are quite a few fine varieties of this lily which will be a fine addition to the garden pond. The old favourite, *N. escarboucle*, rarely fails to give an abundance of fine large plum-red flowers. It is such a good grower that it is unwise to plant it in too small a pond. The other well-known, reddish-coloured lily is *N. James Brydon*, again, a fine plant, with lovely cup-shaped flowers. I do not think that a lily pond would be complete without this hardy specimen.

I have seen fine masses of the water hawthorn, *Aponogeton distachyum*, in some ponds, and if a subject is needed for a shady part of the pond this plant will do splendidly. Do not try to plant any of these specimens at this time of the year. It will be found that most water plants are best planted in the spring. If very heavy frosts are experienced when newly planted water subjects have been planted in late autumn it may be found that they sustain some damage and do not get a good start in the spring.

At this time of the year many leaves may be blown into the pond from surrounding trees and some of these may be dangerous to the inhabitants of the pool. It is a good plan to rake out as many fallen leaves as possible, especially in the small pond. If a large net is used each day many may be lifted out before they have time to sink to the bottom. Although a few leaves may do little harm a lot will depend on the size of the pond; too many in the small pond may cause the water to become foul.

### Pond "Below Stairs"

**I**N the picture on the right, pupils of the girls' school at Four Dwellings, Quinton, near Birmingham, are seen admiring the pond built beneath the stairs in the entrance hall. Work on this new school, which cost £216,000, was completed in July this year shortly before the official opening by the Minister of Education, Miss Florence Horsbrugh.

There are 400 children at the school, aged 11 to 15 years, in surroundings made bright and cheerful with colourful murals and modern colour schemes of decoration. The pond will itself be brighter next year, when the lilies planted in it will bloom, but it is not only intended to serve a decorative function, for the biology classes will be making use of it for aquatic specimens.

Other touches of nature included in the school are provided by vines trailing over bright yellow and blue pillars in the lounges, and by pots of cacti arranged in corners. Placed within sight of the Clent Hills, these buildings represent an entirely new approach for making learning attractive to the young.



Photo:

Birmingham Gazette



# AQUARIST'S Notebook



by  
RAYMOND YATES

THE perfect aquarist society has yet to be formed and all clubs at some time or other, pass through a time of stress when it looks as if the club is going to go out of existence. It takes all sorts to make a world and even in the narrow confines of a small society discord will be unavoidable sometimes. The chairman should know every member personally, however newly joined, and be a man liked and respected by all. If, as sometimes happens, he is one of a clique, it is obvious to all and his impartiality is suspect. He must also be strong enough to deal firmly with the inevitable club bores, bullies and cynics and to call a spade a spade whenever necessary, meanwhile retaining a velvet glove attitude in general. Such men are hard to find and when you have found such a man, accept no excuse from him for vacating the chair. On the other hand there are chairmen who cling pathetically to the office, and are allowed to do so out of apathy, sympathy or because they are someone of consequence in the district, however useless to the club.

The job of secretary is never easy to fill; there is never any rush for this post at annual general meetings. A secretary's life is not an easy one. He is faced with a tremendous amount of work every club night, his attention can never be allowed to wander, and woe betide him if no speaker turns up or one cannot be obtained. The task of the treasurer is not so hard and, apart from the presentation of his accounts to the auditors, he has a fairly easy time of it during the year. Show committees are never large enough. Upon the shoulders of a show committee usually falls almost all the work of organising a show and all too often this is a matter of five or six members. The only way to be certain of adequate help in getting the show ready is to have a show committee of 20 or more members. Laughable, you think. Perhaps, but there is a grain of truth in every joke.

Many of the troubles of aquarist societies are due to shows. Not enough helpers, financial loss, fish losses, favouritism, jealousy and the rest all creep in. Some societies forget that not all members are show-mad and expect the whole of the club's resources and time to be put at the disposal of their show committee. These people just cannot understand the aquarist who is not interested in shows and merely wants to come along to a club for a friendly "natter" and listen to visiting speakers. Then again some clubs use their committees like secret societies as if they dare not divulge anything which goes on to the society at large. Much of the fault with this sort of thing is due to the type of mind which enjoys office for office sake, and which is so common in France where the leader of every petty club or society likes to be addressed in public as "M. le President," or in Germany, where there is a surprising number of men with the title of "Herr Doctor." There are also the members whose sole interest in the club is to make money one way or another out of fishkeepers. These tend to form cliques which can, in time, make a solid voting bloc which can outvote the remaining unorganised members.

A really happy and successful club is one where there is a place for everybody, expert and newcomer, where programmes are fixed up three months in advance and where not too much time at meetings is taken up with business. "They never come back" is a well-worn phrase, but it is true also of those members of aquarium clubs who leave. Members who leave a club in disgust at the way it is carried on are a very bad advertisement. It is true that in some instances these breakaways have formed new clubs which have proved successful, so that even out of wrangling and discord some good has come. Remember, "Fishkeeping is fun." Is it fun in your society?

I called recently on Mr. Snow, a well-known and old established dealer in Leeds, whose speciality is tropicals, but who also sells reptiles, birds and many animals. He was showing me some tanks which have not been disturbed for twenty years which looked to be almost as good as new. He mentioned that he did not favour earthing tanks, as he thought this resulted, in time, in some breakdown of the metal frame coupled with a poisonous exchange with the tank water. Aquarists in the electrical line may have some observations to offer on this aspect.

He had some kuhli loach in recently which spent all their time more or less hidden under a large roundish stone which was riddled with small holes. These loach were left undisturbed for some months and at last it was necessary to move them and the stone. On lifting the stone, about thirty baby loach, about one inch long, were discovered. They were accordingly allowed to continue in peace and when I was there made an amusing spectacle as each of the well-worn holes in the stone contained two or three young loach, with their heads just protruding so that the general effect was that of crowds looking out of windows to watch a procession go by. This accidental breeding was interesting because these fish are not considered ready breeders if at all.

Mr. Snow has one unusual item in his shop in the form of an owl, which sits on a tree branch in a dark corner of the shop. This is electrically wired up with his main thermostat control and the eyes of the owl light up when the thermostat is off. In winter, when the shop door is frequently being opened and shut, the owl's eyes work quite a bit of overtime. I noticed there a method which has been adopted by other dealers, namely to invent names for fish with no popular name. Mr. Snow had a price list on view which included some "free swimming loach." Wondering what these were, I was surprised to find them none other than *Botia strigata*. Some dealers adopt this policy with even better known fish, which can be confusing at times. This dealer has a number of tanks heated with old copper heaters but no ill effects follow. This is true, of course, of many public aquaria, a fact that has frequently been commented upon in the past by other aquarists.

I bought some rather uncommon fish from him (*Nannostomus trifasciatus*), and mentioned how rarely these are on the market or seen in shows. He agreed, and remarked that he had often ordered them but on arrival they had always proved to be one of the commoner varieties of pencil fish. Mr. Snow is an expert with a net and it is a pleasure to watch him catch half-a-dozen really difficult fish all in one operation. He has patience, of course, and looks after this side of his business himself, leaving his large staff to cope with the less specialised sales. We discussed the high prices still obtaining and he mentioned the American effect on the market, not only in the rare fish but as regards animals. It seems the Americans are using certain animals in their atomic and hydrogen bomb tests and prices have risen accordingly. As a case in point a chimpanzee will bring up to five times as much as a few years ago.

When buying fish it is a wise precaution to cover your jar with the lid or cork as each purchase is dropped in, as fish in such conditions are very liable to jump. This also applies once you reach home, and the lid should not be removed and left off, even for a minute, as this is when fish can be

lost. If a fish does jump out it is best to pick it up with a net (if possible) or by pushing something flat underneath it. Using the hands is not recommended, and if you do, see that your hands and fingers are wet. The fish which jumps out collects a lot of dirt and dust off the carpet or floor and this is where trouble comes, as, very often, this introduces that horror of the aquarium, tail rot.

To remove any such dirt adhering to the fish, a good method is to put the fish in a small net and then dip it several times up and down in the tank, followed by a vigorous swirling figure of eight motion with the fish in the net inside the tank. This rough treatment never seems to worry the fish but it does remove all traces of dirt, and tail rot gets no hold. Some fish can survive quite long drops from a tank, and rarely seemed stunned by the fall. All tanks should be covered to prevent fish jumping as the risk is always there (when you are not there) and it is better to be safe than sorry. Swordtails are adepts at jumping but most fish jump at night when the light is put out, or when chased by other fish or a net. Flying barbs seem to be an exception; whatever they do in natural surroundings they seem to prefer to keep their heads under water in captivity.

Some time ago I was asked by a dealer if I knew the difference between a fishkeeper and an aquarist. Naturally, I stalled somewhat, so he gave me his definition. A fishkeeper keeps fish, goes to the dealer, buys what he wants and that's that. Not so the aquarist. He walks in the dealer's shop, grumbles at all on view, price, condition, size and colour and then asks for some rare variety unknown in the town. Next day he comes back to the dealer with 50 brick-red swords asking, "How much for these?"

The barbs are very popular fish and it is safe to say that most aquarists favour the tiger barb (*B. tetrazona*) as being the most popular and most colourful representative. This is seen at shows, where *B. tetrazona* often outnumbers the other barbs two to one. The most colourful barb, however, is one which is not often seen for the simple reason that it is hard to breed. I refer to *B. hexazona*. This fish has six bars, as its name implies, and reaches the same size as the more familiar tiger barb. When adult, *B. hexazona* is superb in colouring and shows more red than *B. tetrazona*. Few dealers or public aquaria have had this fish but some have been on show at the London Zoo quite recently. Another characin which is often recommended to fanciers is the African tetra (*Nannostomus imitator*) and this is fairly easy to obtain nowadays and quite inexpensive. Personally I do not find this fish very satisfactory. It can be very fine when in good colour, but this is not very often.



Photo:

L. E. Perkins

Popular and colourful inclusions for the community tank are tiger barbs (*Barbus tetrazona*)

It is a shy fish which hides away and seems to miss the tit-bits which go to the bolder occupants of the tank. At its best it resembles *Nannostomus anomalus*, but the latter fish is almost always in good condition and colour—African tetras are much too disappointing in this respect.

Clubs have experienced once again a further falling off in the number of people attending their annual shows. This has not been unexpected, as a decline in attendance has been seen over the last two or three years. The public is becoming quite used to the hobby and the novelty has gone. In the larger centres so many shows are held that they tend to detract from each other. It would be in the interest of the hobby if clubs combined to put on a joint effort on a large scale than a large number of small shows where the expenses are relatively high and the income proportionately low. It is not as easy as that, however, as the human element has to be considered. Friction between officials of a club is quite common so it can be even more difficult to work amicably with the officials of other clubs. However, it is done, one example being the Three Counties Show put on at Oxford by the Reading, High Wycombe and Oxford Societies. Talking to a dealer recently on the topic of falling attendances, he mentioned the fact that in large centres many dealers had shops with 60 to 70 tanks on view, almost all semi-furnished aquaria. He said that hundreds of people come in his shop merely to look at the fish and that only one in four is a definite customer. Most of these people would not pay to see a show when they can see such large numbers of fish and tanks for nothing.

Another postage stamp with four fish thereon has been issued by the Maldives Islands. The value of the stamp in question is three larees. Dealers are asking £1 for a set of nine stamps in mint condition.

In *Australian Nature Studies*, Dr. J. A. Leart mentions that a single specimen of the fancier's friend, *Daphnia*, can produce five broods in 19 days, which total 209 youngsters. These mature in 10 days or so and reproduce themselves in the same way, producing 15 daphnia every three days. If all these lived this would mean a grand total of over 12 million *Daphnia* in under two months from a single specimen. Even the guppy cannot compete with figures like this. All things being equal a pair of guppies and their offspring will produce in one year about two-and-a-quarter million fish—what a job it would be finding tank space for all these, let alone purchasers!

When I was a boy the weekly and monthly magazines for boys did not cater for those with aquatic tastes. In fact, anyone who was interested in the hobby in those days was considered to be rather simple. Visitors used to look at my set-up way back in 1919, murmur something about it being "very pretty" and then ask "What is the object?" or "What use is it?" This used to annoy me very much as I had sold my bicycle to buy this tank, an elaborate affair with a three-inch slate bed, a fountain and a mixed collection of large goldfish, rudd, perch and golden orfe. Far from discouraging me this attitude only made me the keener on the hobby but there was little literature available to assist. Nowadays the interest in the aquatic hobby is recognised by the publishers of boys' magazines and interesting features of this nature are often included. The magazine *Eagle* has some excellent sections on the hobby from time to time, including the natural history of pond and stream and the sea, whilst another weekly which caters for even younger children (*The Topper*) makes a speciality of coloured plates of fish, tropical, freshwater and sea-fish. I have collected a large number of them and when I show these to club members when giving a lecture, they are always most interested.



*A page for  
the beginner  
contributed  
by*

A. BOARDER

**N**OW that all breeding is over it is well to look over all the fry which may have been reared either in the pond or under supervised conditions. Where the youngsters are kept in tanks it may be quite an easy matter to sort out those which will pay for growing on. Even among common goldfish there may be many which are malformed in some way and so are not worth keeping. Every fish of this kind which is kept means less space for better fish and the food they eat will also be wasted. Where large numbers of fry are concerned it is advisable to sort them out and to cull rigorously. Do not be hampered with more than you can safely bring through the winter.

Where fish have been bred in the open pond it is much more difficult to do any sorting out. Only by emptying the pond can this task be done, as a rule. Sometimes if feeding is done in one spot for some time the fry will congregate there and can be netted; at least, many may be caught in this manner. They can then be sorted and only the best-shaped ones should be allowed to remain in the pond. With scaled types like common goldfish and fantails it is not possible to be able to sort them as to colour as these types do not change colour for some months. This colour change can be early or late not only according to the strain but also as to individual fishes. I have a young fantail not yet three months of age which is changing colour. This fish has had hardly any direct sunshine on the tank in which it is kept but yet it has started the colour change.

The trouble with breeding in a pond and leaving the youngsters there without sorting them is that in time many undesirable-shaped fish may be there. These will breed with the better fish and so more than ever numbers of badly shaped fish will be produced. Where any fancy type of goldfish are left to themselves for a few years to breed in a pond, many bad types would develop and it is possible that after a time hardly a decent fish would be bred. Often the bigger the runt the hardier it is and so good specimens from a show standpoint could be crowded out.

If your fish have bred during the season do not forget that they may need some extra nourishment to build them up for the coming winter. How often does one hear of the pondkeeper who is losing fish in April through fungus, etc., when a little care in the previous autumn would probably mean that the fishes would have gone through the winter and early spring in the best of health! Repeated spawnings must take a great deal out of fancy goldfish. My own fantails have spawned four times this year up to the end of August. Normal fishes spawn once a season and so it must be realised that our domesticated species have been doing almost the impossible. Unless this is recognised and extra food is given I am certain that the fishes will suffer in the early spring.

The troubles may not be noticed in the actual winter as the fish will be fairly dormant then. It is when they start to move around in the early spring that they show signs of weakness. Feed your pond fish as often as they will take anything, and garden worms are probably the finest food

for them. Do not, however, neglect to give other foods as well. I find that rolled oats are relished and in fact any form of cereal is taken quite well. As long as the fish take food fairly readily it should be given to them in small quantities at a time. Always drop a small amount in at first and give no more unless you are sure that it has been eaten quickly.

Your tanks in the house should have attention and if the water plants have grown too dense they should be thinned out. It is not wise to allow the vegetation to become too thick, for besides restricting the swimming space of the fish, too much plant life can cause trouble, especially during warm nights. Fishes kept in living rooms can have quite a fair amount of ill-treatment in the form of tobacco smoke and heat from fires, without the added danger of excess carbon dioxide emitted by the plants during the night. If you find that the fishes are at the surface of the water the first thing in the morning or that bubbles are at the top, you should suspect some form of water pollution and endeavour to find the cause. It may be decaying food or vegetation, or again too much plant life.

As the temperature of the water becomes lower so will the appetites of the fishes lessen. Do not expect the fish to eat as much when the water temperature is 50° F. as they did when it was 65 degrees.

Some aquarists complain of a film of mould forming over the compost at the tank bottom. This is usually caused by decaying uneaten food. It may be that you have not apparently overfed the fish but there may be something in the fish food which they do not like. This will be ejected. Also among the food may be some dust or very fine particles. Fish are mostly very greedy and will always go for the largest pieces of food. If feeding has been on a fairly liberal scale this fine, dust-like food will be overlooked by the fishes and can then be the cause of the film forming. Should this film be seen it should be siphoned off, and some of the top layer of compost can also be removed at the same time. The compost (or freshly washed new compost) can be put back to make up the amount once it has been cleaned.

Some of the fishes in your tank may have grown well during the year and it may be necessary to examine them carefully to make sure that you have not come to the stage when the tank is overcrowded with fish. If this has happened get another tank or get rid of one or two fish so that those remaining have plenty of space. They will never keep healthy if there are too many in the tank, and the maximum allowance should not exceed one inch of fish to 24 square inches of water surface area. If you have lighting arrangements over your tanks you will find that it is necessary to put the lights on for longer periods now that the days are shorter. The plants are more likely to remain healthy and growing if sufficient light is provided. Use the lamps according to the available daylight and err on the generous side, as the formation of algae through too much light is not so likely to happen at this time of the year as it would have done during the summer.

## Cultured Live Food



Porridge is prepared in the usual way employing finest oatmeal and water, to which some milk may be added. It should be fairly stiff before use.



Consistency of the porridge can be judged from this picture, showing it being transferred to an enamel dish about ten inches in diameter and two inches deep, to form a shallow layer.



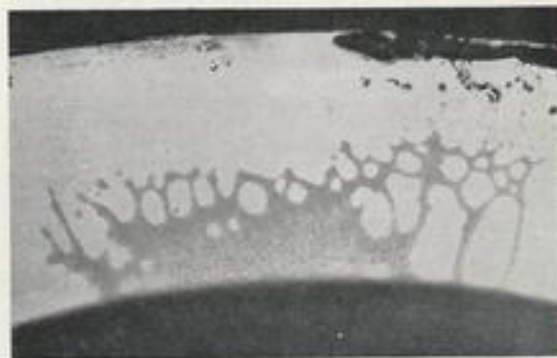
After allowing the porridge to cool, the surface is smeared with a culture of micro worms. An old culture is being used here to "seed" the new dish; the first culture is started with worms obtained from a dealer.

ONCE fish fry have passed the Infusoria stage, that is to say, when they have grown large enough to swallow bigger morsels than tiny Infusorians, it is necessary to find them this larger sized food. If we persevere in feeding Infusoria much longer their progress would be slowed down and finally come almost to a standstill. There are two important cultured live foods that come in at this stage: one is micro worm, and the other is newly hatched brine shrimp. Both are first-class foods and the wise aquarist will use both, and not one or the other, for there is no single perfect food and best results are obtained when a varied diet is given.

Culturing micro worms is usually a simple process if a few simple principles are understood and adhered to. The first requirement is a suitable dish; this can be of glass, porcelain or enamel. All are fairly satisfactory but I feel that enamel dishes give somewhat better results. Glass and porcelain dishes are a bit too smooth for the worms to crawl up conveniently. An old enamel dish provides a rougher surface and hence the worms get a better "toe hold" when they attempt to crawl out of the porridge. This is just a minor point, a matter of feeling, and not necessarily fact, but perhaps worth remembering should you fail with a glass or porcelain dish.

### Porridge Medium

The next thing is the medium in which the worms are cultivated. The best here is porridge, though bread also gives satisfactory results. Cook the porridge well, you may or may not add a spoonful of milk to the mixture. Some aquarists feel that the addition of a small quantity of milk makes a richer meal for the worms and hence ultimately for the fish. However, the most important thing is the consistency of the porridge. An accompanying photograph was taken particularly to show how stiff the porridge must be—see how it lies in heaps in the dish and the reluctant way in which it is coming off the spoon. Many aquarists make the mistake of making the porridge too thin, often almost watery. Such a medium has invariably proved highly unsatisfactory when I have tried it. And do not use porridge in a layer more than about three-quarters of an inch deep in the dish. The worms breed only in the surface.



Two days after covering the dish with a glass plate, if it is in a warm place the worms can be seen in a patterned mass on the sides of the dish above the porridge, the dark part at the bottom of the picture above.

# 1 for Fry—Micro Worms

by Dr. F. N. GHADIALLY

layers of the medium. On the other hand too thin a layer dries off too quickly and is hence unsatisfactory.

When "seeding" the porridge just smear liberally the surface of the porridge with the culture containing the worms. Remember all the time that the worms live at the top of the medium, so don't stir them in. Needless to say, for the same reason use only the top layer of the old culture for seeding fresh ones. Cover up the dish with a piece of glass to prevent excessive evaporation.

Up to this point the whole process is quite simple, but now comes the problem of separating the worms from the porridge. After a day or two, if all is going well and the temperature of the medium has not been allowed to drop too low, you will see the whole surface of the porridge alive and shimmering with millions of worms. And soon after this you should find the worms crawling in sheets up the sides of the dish, where they can be easily scraped off with a knife or razor blade and fed to the fry.

What makes the worms leave the medium? Or what is more important to the aquarist, why do they sometimes refuse to leave the medium? At this phase in the proceedings the porridge develops, to put it mildly, a rather unpleasant odour, and it has been suggested by some that when the smell becomes too bad for even the worms to tolerate they leave the porridge! However in all probability it appears that as the worms multiply the accumulation of their waste products in the medium and the changing pH (increasing acidity) plus mechanical factors such as overcrowding, finally forces the worms to migrate. Every now and again one finds that though the porridge appears to be teeming with worms none leave the medium, thus creating a sort of famine in the midst of plenty for the fry.

## Obtaining the Worms

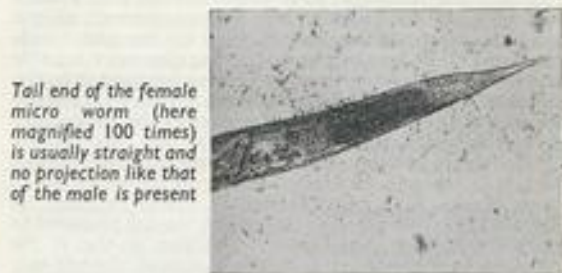
I know no single sure way of making the worms crawl out when they don't want to. However, first check to see that the medium is not too fluid. If this is so, or what is worse, the medium is so fluid that the porridge has settled out, and there is a layer of watery fluid on the top, pour this fluid out and then press into the medium a slice of bread, smear the surface of the bread with some of the culture and let it stand for a day or so. The bread will soak up the excess moisture and also disintegrate in a day or two and provide food for the worms. If the consistency of the medium appears to be correct and still the worms won't budge, then try sprinkling about a spoonful of fresh baker's yeast on the culture. This works like magic sometimes, and as a matter of fact it is a real tonic for any culture. Neither covering the dish so as to exclude light nor fixing a lamp to illuminate the top of the porridge has worked when I have tried this on the recommendation of some fellow aquarists.

The last and most drastic measure of all, recommended by some, is to gradually heat the porridge from the bottom and when the porridge gets uncomfortably hot the worms start crawling out. It works sometimes but more often the

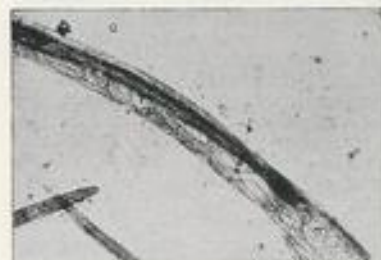
Micro worms picked from the side of a culture dish on a knife point and magnified  $2\frac{1}{2}$  times



Tail ends of two micro worms magnified 80 times showing the curvature and small copulatory organ of the male



Tail end of the female micro worm (here magnified 100 times) is usually straight and no projection like that of the male is present



Young worms in the uterus of the female (magnified about 100 times). The worms move about freely before birth

worms are too obstinate and prefer to be boiled alive rather than leave the medium.

Numerous elaborate ways have been devised by mechanically minded aquarists to collect the worms as they crawl up, such as laying sticks of wood with a piece of glass on top in the medium, using match sticks stuck in the porridge, etc., but none to my mind offers any real advantage over the simple method described here.

There only remains a few small points to mention. Keep the culture covered by a sheet of glass to prevent excessive evaporation and stand it in a fairly warm place such as on the cover glass of the aquarium. Do not disturb the culture prior to feeding; if the dish is moved you will find that the worms rush back into the porridge in a matter of minutes.



## BOOK

## R E V I E W

*A Home Aquarium on a Small Income*, by A. Fraser-Brunner. 127 pages, four colour plates and 25 line drawings. Hutchinson & Co. Ltd., Stratford Place, London, W.1. 2s. 6d.

IT was a pleasure to read a book about aquarium-keeping by so distinguished an aquarist as Mr. A. Fraser-Brunner, who, besides being Advisory Editor of this magazine, is an ichthyologist of international repute. For there is no question that far too many books on aquarium management being published at the present time are little more than re-hashes of what other authors have written before, and which persistently repeat the errors of the past, and even add to the errors of the present, by giving erroneous information, or information which is so sketchy or incomplete that it invariably leads the novice fishkeeper into trouble sooner or later.

In *A Home Aquarium on a Small Income*, Mr. Fraser-Brunner takes the beginner step by step through all the intricacies of the hobby, from setting up the tank (cold-water as well as tropical) and selecting the most suitable fishes for it, to breeding them, and caring for them in health and sickness. Like all aquarists with years of experience behind them, Mr. Fraser-Brunner stresses the importance of "leaving well alone."

"You may possibly have heard rumours of 'pH'—changes in the acid or alkaline quality of the water which affects fishes. My advice," writes Mr. Fraser-Brunner, "is that you pay no attention to this unless you are prepared to study the subject thoroughly. The fact is that if the aquarium is properly set up and maintained, the pH will look after itself; if the pH goes wrong it will be because of something amiss in the set-up, and will not be corrected by altering the pH chemically—on the contrary it is likely to make matters worse." Sound advice indeed; and advice which many aquarists should ponder upon, for too much dabbling with chemicals and salts in the aquarium can lead to sterility in the fishes, and unaccountable troubles such as depletion of oxygen content of the water, and sudden disintegration of the plant life.

This book is marvellous value for the money, and the illustrations in colour are noteworthy for their excellence.

J. H.

*Indoor Aquaria*, by D. Latimer Sayer. English Universities Press Ltd. 6s.

MOST readers will be familiar with the popular "Teach Yourself" books, in their yellow and black covers, and this book is one of the latest issues in this series. Naturally it is a book for the beginner, but it goes considerably beyond the beginner stage and even advanced aquarists will find much of real help in its 185 pages. The author is also an artist and there are almost one hundred illustrations (half or full plate), many of which are in diagrammatic form and which certainly prove to be most instructional. There are no photographs but the author's artistic visual aids more than make up for this. One good example is Plate 83, which gives a menu for the feeding of fry stage by stage in picture form. The most complete novice will soon feel "at home" with the hobby after perusal of this book, the price of which should be within the reach of all.

*Tropical Fish in the Home*, by Douglas Gohm. C. Arthur Pearson, Ltd. 15s.

THIS book was originally issued in 1952, but a new and revised edition has recently appeared at half the original price. This is not a cheap edition in the sense of inferior binding, paper or plates, however. There are some 160 pages with 34 illustrations in colour of tropical fish, something like 90 line drawings and nine photographs as well as numerous tables and charts. One thing which will appeal to the handyman hobbyist is the considerable detail given to the problems of constructing your own aquaria and the information given may well prove invaluable to those with no previous experience in this line. This book will appeal in particular to those aquarists who want something more than an elementary booklet and yet cannot see their way to purchasing the top-priced aquarium books. It is written in a straightforward, simple manner and the section on aquarium management is particularly good. There is a lengthy explanation of water hardness with detailed table of comparisons, a topic rarely mentioned in most aquarium books. The beginner and the more advanced fishkeeper will find this book very useful.

*Exotic Fish Keeping*, by T. H. Marshall. The Saturn Press.

THIS book is being issued in six parts, of which four have been issued to date. These are as follows:—*Breeding the Labyrinths, Breeding the Livebearers, Breeding the Egg-layers, and Aquarium Management and Fish Farming*. The parts which have not yet been issued are *Breeding the Cichlids and Plants and Snails*. Each part sells at 7s. 6d., and although the books are not large, they contain much useful information, for the author is an expert who has been breeding fish on a large scale for over 30 years. His hatchery in Essex was the first in this country to send out the spawn of exotic fish, the eggs being sent in cans, adhering to the plants as they had been laid. At present Mr. Marshall has about 160 tanks and pools, so he is certainly not on the retired list.

The latest section to be issued is *Aquarium Management and Fish Farming*, and this proves very instructive indeed, as the author goes thoroughly into the question of how to make fish breeding pay. He pulls no punches and says outright what he considers are the minimum requirements. Whatever profits can be made he does not disguise the fact that fish breeding is hard work, very hard work indeed. In this book he also goes into the apparatus and set up of the aquarium at some length and sets down therein the wisdom of 30 years' trial and error. There are no drawings or coloured illustrations but there are 24 photographs, mostly taken by the author to illustrate his points. The other three sections which deal with the breeding of livebearers, labyrinths and egg-layers are on similar lines, giving the author's detailed views on the breeding of each variety. Each is illustrated with large photographs of the fish in question, and the livebearer section contains a useful chapter on the diseases of tropical fish.

R. Y.

### Post-Mortem Examination of Fishes:

W. Harold Cotton, F.R.M.S., F.Z.S., 39, Brook Lane, King's Heath, Birmingham, 14. (Phone: Highbury 1693)

Specimens should be sent direct to Mr. Cotton with full particulars of circumstances, and a fee of 3s.

It is important that the following method of packing fish be adopted:—Wrap fish, very wet, and loosely in grease proof paper and then in wet cloth. Re-wrap in grease proof or wax paper and pack around with cotton wool in tin box. Despatch as soon as possible after death, with brief history of aquarium or pond conditions.

## OUR EXPERTS' ANSWERS TO READERS' QUERIES

A few weeks ago I bought an aquarium complete with a selection of fishes, plants, snails and so on. I connected the heater and thermostat to the mains, and everything looked perfect until a few days ago, when, to my dismay, I noticed several of the fishes swimming about with a rolling motion as though unable to keep their balance, and two others—platys—dead on the bottom. When I lifted them out of the water I saw that their scales were standing out from bloated sides. Please can you tell what has gone wrong?

It seems likely that your fish are suffering from the after-effects of a chill. Perhaps the electric current was switched off for a time. This would result in a sudden drop in the temperature of the water, and if the temperature fell below 65° F. then some of the fishes would probably contract swim-bladder trouble. The best thing you can do is to maintain the temperature a few degrees above normal, and lower the depth of the water. If the sufferers from the disease do not get better within a few days, the kindest thing to do is to destroy them. The two fish with raised scales were the victims of dropsy. This might have resulted from a chill, or the fish might have been old. It would be a good idea to add sufficient crystals of permanganate of potash to the water to colour it pale pink, and keep the bottom clear of all dirt and decaying matter.

I have a community aquarium containing a number of fishes including one male Siamese fighting fish. Everything in the tank seemed perfect until I introduced two angel fish. Now I have noticed that the fighting fish has lost one of its ventral fins, and the dorsal fin appears to be rotting away. Do you think the angel fish are to blame for this trouble?

You did not mention in your letter the names of the other fishes in your community tank. Some species often develop into persistent fin-nippers. If you have any tiger barbs in your aquarium, we would be more inclined to suspect these fish than put the blame on the angel fish. On the other hand, some angel fish do become bullies, and bite the fins of slow-moving species, or fishes much smaller than themselves. We advise you to keep a close watch on the behaviour of all the fishes in your aquarium, and when you find the offending occupant, transfer it as soon as possible to another aquarium where it cannot do any damage, say, into a tank containing fast-moving, small-finned species such as zebra fish, Australian rainbow fish and the like.

Can you tell me please how I can decrease the pH value of the water in my aquarium? I think the water is too alkaline for breeding some of the fishes in my possession.

Perhaps the most natural method of softening hard or alkaline water is to pass it through peat or peat moss. The peat should be scalded before being used. Then place it in a muslin bag and suspend it in the aquarium, or strain the aquarium water through it several times over a period of a week to a fortnight. You could place a small amount of peat in clean glass jars and fill them up with tap water.

When the water in the jars has become faintly brownish, strain this water through silk or muslin into the aquarium.

Can you please give me some information on the breeding habits of the white cloud mountain minnow?

White cloud mountain minnows do not deposit their eggs all at one time. Egg-laying continues over a period of several days. The female lays a few eggs here and there in the aquarium, usually in clumps of plant life growing at the bottom of the water. The fish breed best at about 70° to 72° F. If the aquarium is larger than 18 ins. by 12 ins. by 12 ins., and thickly planted, the parent fish can remain where they are, for although some of the tiny fry will be eaten, quite a number will escape being eaten and will quickly develop into brightly coloured little fishes. On the other hand, if you wish to raise as many fry as possible, remove the parent fish after they appear to have finished

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of fish-keeping 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.

spawning; that is, after a period of a week to 10 days; or, better still, prepare several small tanks, and move the parent fish from one to another every second or third day, leaving the fry to develop without fear of their being eaten by the grown-up fish. Once you get the knack of breeding these lovely little fish, raising the fry should not prove at all difficult.

I have two large angel fish. To my dismay, they have both contracted fungus disease. How should I go about treating it? I have only the one aquarium, and do not wish to uproot a fine collection of choice aquatic plants.

Fungus disease usually attacks fish which are in a run-down condition or which are kept in dirty surroundings. Sometimes fungus will make its appearance on the side of a fish which has rubbed some scales off on a sharp piece of rockwork, or been bitten by another fish. Perhaps your best plan would be to net the fish and swab the diseased parts with a piece of cotton wool dipped in tepid salt water. Repeat treatment several times over a period of four or five days. Meanwhile, keep the bottom of the aquarium well siphoned to exclude all dirt and decaying matter, and dissolve sufficient crystals of permanganate of potash in the water to colour it pale pink. Exclude dried food from the fish's diet: feed only on live food such as chopped earthworms, and raw, washed liver or red meat. Keep the temperature of the water a few degrees above normal.



Photo:

L. E. Perkins

Egg-laying in white cloud mountain minnows may last over a period of several days

Last Easter my community aquarium became infected with white spot disease, and I effected a cure by treating it with quinine hydrochloride. Since I used this treatment, however, my female guppies have not dropped any more babies, and several of the other fishes in the tank have died under mysterious circumstances; that is, perfectly well one day, and dead the next without, I might add, any external signs of damage or disease. Do you think the quinine treatment is bad for fish?

Some species of fish do not take well to the quinine treatment, and die after being subjected to it, earlier than they should. Quinine hydrochloride is believed to interfere with the correct functioning of the reproductive organs in

certain species. For this reason, some aquarists prefer to treat white spot disease with heat alone, or heat coupled with a few drops of a five per cent. solution of methylene blue.

I have noticed that just before a spell of warm weather, my livebearers usually drop their young. When the weather is cold the period between batches of young seems to be more protracted. Are fishes sensitive to weather changes?

Some fishes are very sensitive to changes in the weather and can sense or anticipate atmospheric changes hours in advance. Loaches are very gifted in this respect, and some of them have been used in Japan to give warning of earthquakes. The ordinary weather-fish, *Gobitis taenia*, of European fresh waters, is very sensitive to approaching storms, and will become most active and swim excitedly about its aquarium just before a cloudburst or onset of a rainy spell.

Please will you give me a treatment for velvet disease?

Transfer the diseased fish to a bare tank. That is, a tank without sand on the bottom or plant-life. Add one heaped teaspoonful of household salt to every gallon of water contained in it. Now dissolve one tablet (0.46 grains) of acriflavine in 80 drops of water. Add five drops of this solution to every gallon of water being treated. Keep the aquarium shaded with paper, or completely dark. If possible, provide artificial aeration. Leave the fish in the hospital tank, and repeat the same dose of acriflavine solution after about five days. In the meantime, siphon all sediment from the bottom of the original aquarium and cut away all unhealthy leaves and branches of plant life. Add five drops of the acriflavine solution to every gallon of water in the aquarium and leave to stand for a week before returning the fish, even though they may be cured before this time. All nets, glass tubes, scrapers and the like should be

sterilised by dipping in Dettol or Milton before being used again in the aquarium.

Please can you tell me how to preserve the leaves of water plants so that I can use them to instruct my class-mates at school how to recognise the various species used in the aquarium hobby?

To preserve water plants, you will have to adopt the same methods that botanists use to preserve the foliage of terrestrial plants; that is, press them between leaves of absorbent paper—blotting paper, for instance. All this must be done with very great care, for water plants are very fragile. Of course, you must not expect the foliage to look quite like living foliage. The colours will vanish, and the leaves will present a dried-out, yellowish-brown appearance. All the same, the outline of the leaves and the veining in them will be preserved, and this should help to guide the student in identifying living specimens.

I have recently set up a tropical aquarium and am now perturbed by the fact that the water has become very foggy. I have tried siphoning out most of the water and filling up with fresh, but the foginess still persists. There appears to be countless numbers of minute particles of dust floating about in it. What can I do to get crystal-clear water?

We advise you to strain or filter the water through several layers of nylon or thick layer of well-washed silver sand. Increase the amount of plant life in the aquarium, especially along the back and ends, and keep the bottom clear of uneaten food and decaying plant life. New water often takes some time to settle down and assume that crystal clarity so beloved by aquarium keepers. Adding fresh water will not do any good. Leave well alone, maintain scrupulous cleanliness, and you will find that the water will gradually clear of its own accord. We hasten to add, however, that some species of fish cloud the water by continually turning up the bottom in search of food. In a thickly planted aquarium, scavenging fishes cause little or no trouble, but in rather bare tanks they will soon cloud the water whether you keep the bottom clean or not.

## COLDWATER FISHKEEPING QUERIES *answered by* A. BOARDER

I have been told that the leaves of certain trees and shrubs will poison the water in which fish are kept. Is this true?

In a large body of water, say, in a small lake, or really large garden pond, leaves dropping into the water from trees seldom do any harm. But in a small lily pond or ornamental rock garden pool, leaves from certain shrubs and trees can endanger fish and other water life. For instance, it is best to keep a small fish-pond free of holly leaves, the leaves of rhododendrons, laburnums, juniper and the like. Beech leaves and oak leaves are harmless in themselves, but too many of them decaying in a small body of water will soon cause the pH value to become too acid for most fishes commonly kept outdoors.

I have a pond in the garden and wish to stock it with fish. What kinds can I have and will it be possible to leave them to themselves without any artificial feeding?

It will be quite possible for you to have some fish in your pond which do not need constant feeding. The chief point to remember is that if you wish your pond to be self-supporting you must not over-stock it with fish. Any fair-sized, well-planted pond can easily maintain a few fish without having to resort to artificial feeding. I suggest that you have a few goldfish, or shubunkins. As long as they have plenty of room and there is a fair amount of vegetation they will get along quite well on their own. These types of fish eat much vegetation and they will also find worms which get into the pond, as well as the larvae of many insects.

I have a coldwater tank 16 ins. by 8 ins. by 8 ins. containing five goldfish averaging two inches long. I have plenty of weeds and some snails but find difficulty in keeping the water clear. I started eight weeks ago with eight fish and after a time they started to die off until only three were left. I bought some more but they all went the same way. The symptoms are—the top fin drops flat and then the lower half of the tail folds up. The fish then remains at the surface until it dies. What is the complaint and the cure?

The "complaint" is overcrowding and the cure is to keep only enough fish for the size of the tank—in your case not more than five inches of fish at the most. As often as you put too many fish in a tank some will die off until the correct balance has been obtained. Fishes can never live healthily if overcrowded and it is cruel to attempt to do so. Why not invest in my book, *Coldwater Fishkeeping*, 2s. 8d. post paid from *The Aquarist*? Had you done this in the beginning it would have saved you a lot of expense and trouble.

My local authority has informed me that I require a licence to sell tropical fish. Could you please inform me if this is correct? I do not sell any other livestock, only tropical fish and all the various accessories.

Your local authority is probably quite right but they could possibly have given you more information than they appear to have done. They have the power to issue a licence. The Pet Animals Act, 1951 (14 and 15 Geo., 6th., Cap. 35), came into force on 1st April, 1952. This Act makes it imperative for all pet shopkeepers to obtain a licence from the local authority at a cost not exceeding 10s. You can get a copy



of the Act from Her Majesty's Stationery Office, or, no doubt, the local police can show you a copy.

I am bothered with a quantity of algae in my tank: the rocks and some of the plants are covered with a short furry growth. How can I keep it down?

Many tanks have a certain amount of algae, especially those which have been set up for a long time. My own tanks have had it but unless it gets too bad I do not think that it matters much. I am sure that much of it is caused through over-feeding the fish. Many types of fish will feed on algae if they are hungry. Also the water condition can encourage it in certain circumstances. There is no need to dismantle and sterilise the tank. An easy way to get rid of the algae is to introduce a good number of tadpoles. These are the finest scavengers I know and in a short time will clear up all the algae from the rocks and plants. If your fish are large enough they can eat the tadpoles, although they will not eat tadpoles of toads. Once tadpoles are older than about a week they have to come to the surface for air and so will not use up the oxygen in the water. See that a large cork or similar substance is placed in the water to enable the developed frogs or toads to climb onto or they will soon drown once the tail is absorbed.

I have a fairly large pool in my garden stocked with fishes and water lilies, etc., but it has developed a leak somewhere and after topping-up the level goes down quite six inches in as many hours. I seem to have read somewhere that the leaks can be detected but I cannot remember how, can you help?

Your pond appears to have a large crack for the water to go down so rapidly. The sure way of finding a leak is to empty the pond in a fine day, and then, as the concrete dries cracks will become apparent for they remain wet long after the rest of the concrete has dried. There is more than one method for repairing the leaks but it is very difficult to make a permanent repair. As long as the pond does not freeze up the repairs can hold, but once a heavy freeze occurs the cracks are likely to be reopened. It is most difficult to get fresh concrete to join to old concrete, and I have found that although a join appears to have been effected, after some months the fresh concrete just peels away from the rest. If the crack is a large one it is a good plan to clean it out as much as possible and then force in a mixture of quick-drying cement and sand (about two to one of cement). The crack only should be filled and I do not advise allowing the cement to overlap the sides, as I have found that this overlap invariably comes away. Small cracks can be sealed with one of the mastic preparations on the market and I have often been able to do the job with ordinary putty. Of course, this latter method is only suitable for temporary repairs as once the concrete is moved by the expansion of freezing water the cracks will open again. If a pond leaks very badly the only method of procedure is to float over the whole surface with a fresh coating of strong cement mixture.

I have two goldfish in quite a small tank and I am not sure of the sex of the fishes. On two occasions lately I have found a number of small transparent globules about the size of a pin's head on the bottom. Are these fish eggs and if so could I hatch them?

They are undoubtedly fish eggs but whether you could hatch them is another matter. It is possible that both fish are females and that being full of eggs they have extruded them when they could not be fertilised, and so they would not hatch. If you noticed one fish chasing and nudging the other it is quite possible that it would be a male and the eggs may have been fertilised. If so and you could get some eggs out they might hatch satisfactorily. Place some loose water plants in the tank, as the eggs are adhesive and having stuck to the plants could be removed more easily with them for hatching elsewhere.

I am considering building a pond, and as my soil is solid clay I am wondering whether the pond would hold water with only

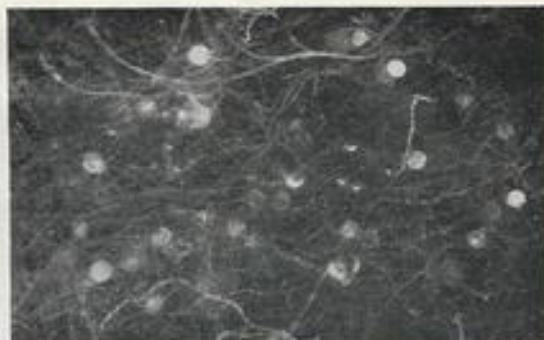


Photo: L. E. Perkins  
In this enlarged view of goldfish eggs on blanket weed the infertile eggs appear white and fertile eggs are almost transparent

a clay base. I thought of making faced concrete block sides, do you think this would be all right?

Providing the soil under the pond is all clay and that you go down well into it for the foundations for the sides I do not see why the pond should not hold water. You would have to see that the clay base came at least six inches up the sides of the pond. As long as the pond was kept filled with water all should be well. You might find a slight loss during hot weather. Clay has a nasty habit of shrinking and cracking when very dry. The clay near the pond might do this but providing there was sufficient coverage up the sides I do not think the pond will leak. Of course, you would find that the water plants would grow apace in such a medium as the roots would have no restrictions as in a concrete-based pond. The control of them would therefore call for much attention but, of course, this could be attended to regularly.

I have a pond 10 ft. 6 ins. by 7 ft. and 2 ft. deep; can you recommend the best types of water lilies and aerating plants?

I should only use two water lilies, as after a year or two they can grow quite large and may cover too much of the surface area if more than two are used. Choose a medium-sized type such as *Nymphaea escarboucle*, a fine dark red; or *N. sunrise*, a scented yellow. You could also have two or three other above-water-leaved plants such as water cork; rush, say *Butomus umbellatus*; the pickerel weed, *Potamogeton cordata*, or one of the larger *Sagittaria*. For underwater plants you can choose from *Egeria densa*, *Lagarosiphon major*, *Myriophyllum*, *Ceratophyllum demersum*, and *Elodea canadensis*. Do not overdo this planting as most water plants increase at a fast rate and in no time the water can become filled with plants, and the fish may be crowded out or, at least, hidden from view.

The other day I found a goldfish in the pond wedged between the stem of a water plant and the side of the pond. Two other fishes were worrying it. I caught it and found that it had some wounds on the sides but it seems fairly active. How can I cure it?

I expect the fish will soon get all right, and the wounds will heal at this time of the year. If the fish had been found injured in the early parts of the year there would have been almost certainly traces of fungus on it in a short time and this disease could have caused more harm to the fish than the actual wounds. The fish may be attacked by fungus now although it is less likely. Give it a salt bath and keep it by itself. It appears to me that the fish is a female and was being chased by males when it became wedged. The fish were not trying to harm it but to incite it to spawn. Any damage on goldfish such as split or broken fins or lost scales will heal and re-grow fairly well as long as the warmer weather lasts. It is during very cold weather that these wounds take so long to heal, and are then subject to attacks by fungus.

# 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

## Native Fishes

IT was with interest that I read the article "Gudgeon in the Aquarium" in the July issue of *The Aquarist*. I would like to bring to your readers' notice an experience of my own in keeping native fishes in an aquarium.

Before my society's show last year it was decided to put a tank of British fishes on exhibition, and together with other members I set out to catch the exhibits. I picked out two silver bream, two bleak and a gudgeon, which were brought home in a can and duly appeared on show. After the show (over 12 months ago) one of our members asked for these fishes and he installed them in a 24 ins. aquarium.

The gudgeon lived until last week, but the others are still alive and appear quite happy and thriving. In fact they have doubled their size, and the silver bream in particular look very stately and handsome. Some people will say these are not aquarium fishes; I never thought so but these specimens have done well under tank conditions and will, I hope, look at the public again in this year's show.

P. BENSTEAD,  
Sleaford, Lincs.

## Pocket Net

MANY times on "club nights" members bring jars of fishes for disposal and no one present has a net which goes in the jar. To overcome this make a net frame from spring steel (an old clock watch or small clock spring will do). Cut a length about 9 to 12 inches long and beat the ends so that they can be bent into a shank and bind the shank with thin copper wire. Then solder the wire to form a shank which will fit the handle.

The handle may be made from a piece of wood dowelling or a pen-holder, with a suitable hole drilled in the end so that the net is detachable. If the net itself is made from nylon, which dries quickly, the whole thing may easily be carried in the pocket. Its spring structure allows it to slip into any sized container and resume its original shape on withdrawal.

H. A. HALLETT,  
Harlow, Essex.

## Gas Embolism

IN *The Aquarist* for July the question was asked about fantail goldfish showing bubbles or blisters in their tails, and the answer was given that this was a form of fin rot to be cured by immersion in salt or hydrogen peroxide solutions.

This trouble is, however, not fin rot but due to the fish

being kept in water which has become too green. All that is necessary is to transfer the fish to clear water, when the bubbles will disappear in a day or so.

V. CAPALDI,  
Bristol, 2.

*An article concerning this appeared in last month's issue, where it was shown that in the advanced state of the trouble a condition resembling fin rot develops. Mr. A. Boarder reports that he has seen gaseous embolism resulting from fishes being placed in aquaria which had been filled with water from high pressure hoses at a show.—EDITOR.*

## Heating Failures

WITH reference to Mr. L. Warburton's letter in the August issue of *The Aquarist*, I regret that I cannot agree with him concerning battery alarms—I consider these to be more reliable than the mains type. The shelf life of a good battery is well over two years—I know, as I use these batteries in a master clock taking current every second. Battery replacements for an alarm could be every six months regardless, at a cost of only one shilling a year, and to offset this cost there is no extra wiring required and a warning is given when the mains on a slot meter system may have failed.

I have completed a new aquarium which is completely foolproof against heater failure. The base rests on a box six inches deep and having a shelf three inches from the glass of the base. On top of this shelf are fitted two 15 watt bed warmers, and beneath it are two fuse boxes with glass cartridge fuses (1 amp for lighting, 1.5 amp for heaters). All wiring to the tank enters the box at the rear, and it is hinged for easy access to fuses; a diamond shape cut out from the front panel and backed with red transparent material lights up from a warning light when the emergency heating system of the bed warmers comes into operation. This operates as follows: after heater failure the temperature falls to 70°F, and then an emergency switch operates the base heaters, the thermostat taking over again at 75°F. Only on this circuit does the warning light go on and off with the heaters operating. The cost of maintenance is nil, and the emergency system can also be switched on manually to operate at the same time as the immersion heater to help the load on very cold days. The emergency heaters last as long as one cares to run the aquarium.

J. MAYES,  
London, N.20

### Delayed Hatching?

I HAVE read and re-read the article "Delayed Hatching of *Pristella riddlei*" in your August issue and have no doubt whatsoever that, however sincere the writer may be, he has apparently searched for the mystical and not investigated the natural. Let me begin with a perfectly true story about my pond. In the summer of 1949, when my only stock of fish consisted of five shubunkins, and no other fishes had ever been in my home.

Admiring the "shus" one night, I saw three or four small fry about three-quarters of an inch long. These I netted, and to my perpetual amazement I found all were flame fish! Can I repeat?—I had not, and never had, such fish in my house. If I had flame fish, say, a year previously, perhaps I could be forgiven for assuming a delayed hatching? Of course, the explanation is simple—eggs transferred on plants, nets, siphon tubes, etc., can account for all of these late, delayed hatchings. Even water splashed by fishes can contain eggs, and in opposition to all Mr. Warburton's theories I have never read or heard from any authority of characin eggs being "stopped" for 12 weeks.

When I read the emphatic statements made by Mr. Warburton that species of fishes will adjust their own pH, and then read his list of breeding details—electrically measured pH, specially controlled plus or minus 1° temperature control, hormones of the synthetic human type—I am of the opinion that the author's hobby is science and not fish. Can I suggest to him in all friendship that he reads Werner Ladiges on pH in *Fisch in der Landschaft*, where it is stated that where these fishes are caught the pH goes up and down (like Tower Bridge—mine, not Werner Ladiges'). To conclude, I feel that Mr. Warburton has been so scrupulous in his search for a scientific rare fact that he has missed an everyday accidental fact.

B. CALROW,  
Hendon Aquatic Society.

### Identification Please!

WHILE collecting fishes for the Hendon Aquatic Society in a small pool about 20 miles north-west of Lagos, vast quantities of floating plants were seen by Mr. Jack Robertshaw of that society. These were mainly of a type about the size of *Salvinia*, and the many-shaped leaves can be likened to the various snowflake patterns and are of velvety texture. In fact, a green velvet snowflake is an excellent description; can anyone suggest what these can be?

B. C. FREDERICKS,  
Hendon, Middlesex.

### Marine Association

I AM writing you this letter in the name of the Institution Biologia Maritima, an association of Dutch amateurs keeping sea-aquaria and studying the biology of the sea and the seashore. We are organising intensive international relations between the amateur associations in the countries of West Europe. We maintain already these relations with Germany, Belgium and Switzerland.

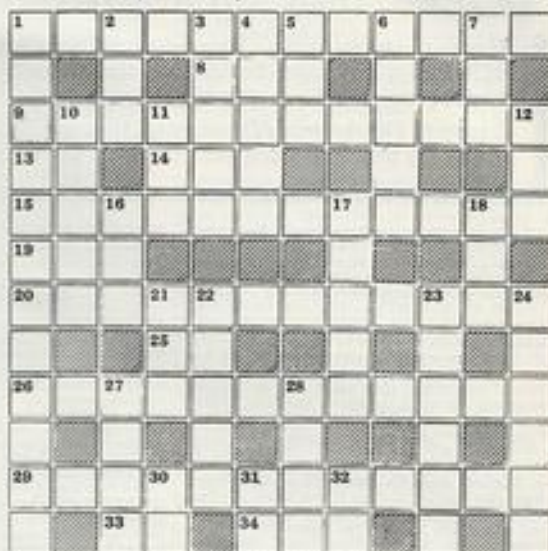
However, in Great Britain we don't have any point of contact. We don't even know anything about the existence of one or more associations like ours in your country. Perhaps you might publish something about our efforts in your periodical. Next 3rd October we have a congress at Scheveningen and there will be also delegates from Germany, Belgium and Switzerland. A short time back there was a congress at Wuppertal. We are planning an interchange of data about sea-aquarium-keeping to reach a higher level in this hobby.

H. COMPAN,  
42, Abeelstraat,  
The Hague, Holland.

The address of the British Marine Aquarists' Society has been sent to Mr. Compaa.—EDITOR.

## The AQUARIST Crossword

Compiled by J. LAUGHLAND



### CLUES ACROSS

- Lyme fen Loach (anagram of insect) (9, 3)
- Fish eggs (3)
- Fish markings, simply side-lines (7, 5)
- Clerical distinction of the rudd (1, 1)
- Anglers and scholars will take differing lines on its use. (3)
- Royal Marine or 29 Across? (5, 7)
- It's in hairgrass, but fish obtain theirs from water (3)
- Genus of mosaic and blue gouramies (12)
- Moorists' organisation (1, 1)
- Salmo trutta* (7, 5)
- Waterworks? Weed? Not to aquarists! (7, 5)
- Little angel? (2)
- Snowshoe of fishskin? (3)

### CLUES DOWN

- Year-round swimmer or goldfish enthusiast? (4, 5, 3)
- Its eggs were once popular food for goldfish (3)
- This is a mistake (5)
- Bardens (5)
- Anguilla anguilla* (3)
- Water sprite (5)
- Anguilla* returns to the sheltered side (3)
- Robin of the old song (5)
- Larger part of the mere (3)
- The sireon or larval axolotl begins to address a gentleman (3)
- Prefix commonly used in piscatorial and other sciences, and denoting three (3)
- No less than 7 down and 33 across (5)
- West Country river sounds as if it were gone (3)
- Can be a necessity for bait or fish (3)
- Mixed bait aspirated becomes custom or costume (5)
- Chest (6)
- What the cilia of rotifers appear to do, hence their name (6)
- Specific name of the orfe (4)
- Creek (4)
- Up and —'em (2)
- Obviously is (2)
- Mixed type but not crossbred (2)

### PICK YOUR ANSWER

- The trivial name *callipterus*, as in *Barbus callipterus*, implies that the species has: (a) Beautiful fins. (b) Large scales. (c) Sharp teeth. (d) Small eyes.
- Bolmatia nigra* is popularly known as the: (a) Bob Tail. (b) Comb Tail. (c) Lyre Tail. (d) Scissors Tail.
- Pterophyllum scalare* (the angel fish) was named by: (a) Bloch and Schneider. (b) Cuvier and Valenciennes. (c) Muller and Troschel. (d) Weber and de Beaufort.
- Which is the largest of the following species? (a) *Rasbora elegans*. (b) *Rasbora jacobsoni*. (c) *Rasbora munieri*. (d) *Rasbora taeniata*.
- In shape, the leaves of *Cubomba aquatica* are: (a) Cordate. (b) Hastate. (c) Linear. (d) Reniform.
- The genus *Proserpinaca* (mermaid weed) is indigenous to: (a) East Africa. (b) North America. (c) South America. (d) West Africa.

(Solutions on page 158)

G. F. H.



## from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 5th of the month preceding the month of publication.

A copy of *The Aquarist's Directory of Aquarium Societies* will be sent free to any reader on receipt of a stamped, self-addressed envelope.

AT recent meetings of the **Arnold Aquarists** (secretary, Mrs. V. Trant, 20, Thirlmere Gardens, Wembley, Middlesex), members have heard talks on aquarium plants by Mr. L. Cave and on keeping a marine tank by Mr. N. Allies.

LEADING breeder of fishes in the **Basingstoke Aquarist Society** is reported to be Mr. W. Lock-Bowers, who, with the egg-layers, has been successful with beacons, black widows, flames, nigger and rosy barbs, zebras, danios, mountain minnows, rainbows and blue gouramis to date. He is now attempting to breed *Hypoclineryx serpa*.

COMPETITORS in a "four-sided" show held in Bedford were the **Bedford and District Aquarist Society** and the **North Herts., Corby, and Kettering societies**. Four furnished aquaria and about 100 fishes were judged by Mr. C. Creed, who placed Kettering's furnished aquarium entry first, gave Bedford two firsts for individual fishes and awarded the title of best fish in the show to a north Herts. member's entry.

REIMBURSEMENT scheme for members suffering losses of tropical fishes as a result of heater or thermostat failure is a new venture by the **Bexhill and District Aquarist Society**. A grant of one guinea from club funds is made at the discretion of two committee members. In addition, a spare heater and thermostat are kept at the ready day and night by the society's secretary for members' emergencies.

WHEN giving a talk on aquatic plants to the **Bristol Tropical Fish Club**, Dr. F. G. W. Knowles showed coloured pictures of his subjects taken by himself. For plant growth the speaker recommended a compost of one-third leaf mould, one-third river sand and one-third small pebbles, mixed, sterilised, and placed to a depth of about a quarter of an inch on the bottom of the aquarium below the sand. For *Cryptocoryne* species it was claimed that this compost gave rapid growth in good light, and that they would also do well if planted in sand only but with poor light.

ANNUAL home furnished aquaria competition of the **Chelsea Aquarium Society** is being held this month, and a trophy of original design is offered as main award. Recent competitive activities of the society include an inter-club show with **Clapham Aquarists' Society**, at which Chelsea gained most points.

CHILSTER and **District Aquarist Society** has been holding joint evening meetings with **Crewe and District Aquarist Society**. Table shows have been held by the two societies and also they have staged the "quiz" game.

NYLON "pan-scrubbers," or loofahs, were suggested by D. C. Cole as good egg traps for zebra fishes if weighted with lead in the breeding tank, when he lectured on breeding common egg-layers to the **Coventry Pool and Aquarium Society**. He recommended a breeding water depth for most species of three to five inches and plenty of plants (preferably water lettuce). Adding peat water to aquaria (three or four teaspoonfuls to a 24 in. tank) was claimed to be beneficial to fishes and plants.

MEETINGS of the **Feltham and District Aquarist Society** are held on alternate Tuesdays at the Railway Tavern, Feltham, Middlesex, at 8 p.m. Secretary is Miss Irene Evans, 101, Raleigh Road, Feltham, Middlesex.

AN aquarium containing tropical fishes has been installed in the children's ward of a local hospital by the **Guildford and District Aquarist Club** and is being serviced weekly by members according to a rota. Last month Mr. R. J. Cundall talked to the club about freshwater algae, illustrating his descriptions with coloured drawings made during his own microscope studies. Owing to lack of support a proposed exhibition of aquaria in Guildford by the club has been cancelled.

DURING the summer members of the **Hampstead Aquatic Society** visited the establishment of a fish breeder and importer at Downhurst, Surrey. Several interesting new importations were examined, including the freshwater miniature goby (*Brachygyobius rasi*) from Siam, and the red-tailed black sharks (*Labeo bicolor*).

DURING Hastings Carnival Week, a show of marine, tropical and coldwater fishes was staged in conjunction with the **Hobbeys' Exhibition by Hastings and St. Leonards' Aquarist Society**. Mr. R. G. B. List, secretary of the F.B.A.S., has visited the society to tell members about the work of his Federation and also gave a practical talk on general fishkeeping.

A FULL programme for this month is reported from **Hull Pond and Aquarium Society**. On the 7th, a table show of coldwater fishes is to be judged by the vice-chairman, Mr. P. Thompson, and will be followed by a "brains trust." The table show on the 21st will be for tropical labyrinth fishes, and will be judged by the society's secretary, Mr. A. Rimmington. A quiz is also planned for this evening meeting, and new members are invited to attend with their friends.

LAST month a presentation of a furnished aquarium to the **Norwood Cottage Hospital** was made by Brig. Gen. Smythe, V.C., M.P., on behalf of **Lambeth Aquarist Society**. The society staged its annual show on the 18th September.

MEETINGS of the **Llantwit Major Aquarist Society** are now held on the second Wednesday of each month, 7.30 p.m., at the Cross Keys Hotel, Llantwit Major. Secretary is Mr. R. S. Wigg, 17, Ham Lane South, Llantwit Major, Glamorgan, S. Wales.

PRESIDENT of the **Midland Association of Aquarists' Societies** is Mr. A. Panser-Brunner, first president to be elected. An Association rally held last month for the 19 affiliated societies is reported on page 158.

EXHIBITION of tropical and coldwater fishes was staged by the **Newcastle and District Aquarist Society** in the Newcastle upon Tyne Flower Show in August. Twenty-four aquaria and a vivarium containing snakes and green lizards were on show.

IT has been decided to consider the reorganisa-

tion of the **North West London Group of Aquarist Clubs**, owing to the formation of another group for societies in the south-west Middlesex area. Mr. A. H. Charles is acting as liaison officer and societies concerned who have not yet communicated with him are asked to do so at 91, The Parade, Uxbridge Road, Hanwell, Middlesex.

ACTIVITIES of the **North of Scotland Aquarist Society** commenced on 28th September last for this session, and meetings will take place fortnightly from that date. Secretary of the society is Mr. T. McRobb, 20, Seamount Place, Aberdeen, Scotland.

FOURTEEN species of tropical fishes were shown at a small table show staged for the monthly meeting of the **Norwich Fishkeepers' Circle** last month. Most of the fishes had been bred by members, and each exhibitor gave a short talk. The junior section of the circle has been entertained at the home of the chairman, Mr. A. Huson, who also gave a talk on furnished aquaria and fancy goldfish types.

AT the **Peterborough and District Aquarists' Society** show, a new variety of platy was on show, known as the festival platy. The Richards Cup for best fish in the show was awarded for a "talking catfish" to Mr. R. Lickerish; Mr. H. Richards, who secured the highest number of points with his entries and won the Points Cup, also won the cup for the best furnished tropical aquarium. Mr. R. Scott exhibited the best coldwater furnished aquarium.

THE **Shelf and District Aquarist Society** has been disbanded.

A MARQUEE display of over 30 tropical and coldwater aquaria was seen by a large public attendance when staged by the **Sleaford and District Aquarists' Society** as part of a local show and sports.

### Cardiff Show

THE **Welsh National Aquarists' Society** has reported an extremely successful show held in Cardiff this year, with 150 entries and visiting aquarists coming from a wide area. Mr. J. L. Roberts was awarded a cup for the best coldwater fish in the show and another for the best fish in the show. Best tropical fish in the show was a sailfin mollie entered by Mr. A. Phipps, another cup winner. Best furnished aquarium was displayed by Mr. J. Martin and best points aggregate was gained by society member Mr. J. Amesbury, cups being awarded to both. The cup for the winner of the inter-society contest was carried off by **Newport Aquarist Society**.

### Blackpool Show

THERE were 14 classes with 203 entries at the **Blackpool and Pylle Aquatic Society Show** this year. Mr. A. Wardle, of Bury, took "Best Fish in the Show" with a *Radii hadis*. Mr. J. Peck's *A. ramirezi* took "Best Member's Fish." Full results were as follows:—

- Class A. *Club Furnished Aquaria*
  - 1, Bury & District A.S.; 2, Fleetwood & District A.S.
- Class B. *Individual Coldwater Furnished Aquaria*
  - 1, Mr. V. Fletcher; 2, Mr. J. Woodcock; 3, Mr. W. Dann. All of Blackpool.
- Class C. *Individual Tropical Furnished Aquaria*
  - 1, Mrs. J. Dodsworth, Rochdale; 2, Mrs. D. Loder, Burnley; 3, Mr. A. Wardle, Bury.
- Class E. *Vivaria*
  - 1 and 2, B. Conroy, Blackpool.
- Class F. *Coldwater Fish*
  - Common Goldfish. 1, Mrs. L. Newton, Blackpool; 2, Mr. J. Horrocks, Blackpool; 3, Mr. N. A. Brown, Wigan.
  - Fancy Goldfish. 1, Mr. C. B. Higginson, Blackpool; 2, Mr. S. Walsh, Blackburn; 3, Mr. V. Fletcher, Blackpool.
- Class G. *Livebearers*
  - Swordtail. 1, Mrs. J. Paine, Southport;

Mr. C. Newton, Blackpool; 3, Mr. T. Paine, Southport and B. Norris, Blackpool.

**Platy:** 1 and 2, Mr. C. Newton, Blackpool; 3, Mr. D. Ince, Chorley.

**Mollie:** 1, Mr. C. A. Blake, Rochdale; 2, Mr. F. Taylor, Burnley; 3, Mr. J. Woodcock, Blackpool.

**Guppy:** 1, Mr. F. Taylor, Burnley; 2, Mr. C. Newton, Blackpool; 3, Mrs. E. Perrie, Blackpool.

**Class H. Characin**  
1, Mr. F. Holden, Blackpool; 2, Mr. T. Paine, Southport; 3, Mr. C. B. Higginson, Blackpool.

**Class J. Labyrinth**  
**Dwarf Gourami:** Mr. J. Marsden, Blackpool; 2, Mr. J. Peck, Blackpool; 3, Mr. F. Davies, Blackpool.

**AOV Labyrinth:** 1, Mr. C. Newton, Blackpool; Joint 2, Mrs. M. Woodcock and B. Norris.

**Class K. Fighting Fish**  
1, Mr. A. Willan, Blackburn; 2, Mr. R. R. Walsh, Blackburn; 3, Mrs. M. Woodcock, Blackpool.

**Class L. Minnow**  
1, Mrs. E. Perrie, Blackpool; 2, Mr. A. Willan, Blackburn; 3, Mr. J. Paine, Southport.

**Class M. Barb**  
1, Mr. F. Davies, Blackpool; 2, B. Hadson, Fleetwood; 3, Mr. R. Birch, Fleetwood.

**Class N. Cichlid**  
**Dwarf:** 1, Mr. J. Peck; 2, Mr. C. Newton; 3, Mr. J. Woodcock, all of Blackpool.

**Angus:** 1, Mr. F. Davies, Blackpool; 2, Mr. J. Dodsworth, Rochdale; 3, Mr. C. Newton, Blackpool.

**AOV Cichlid:** 1, Mr. G. D. Grimshaw, Bury; 2, Mr. C. Newton, Blackpool.

**Class O. Egg-laying Toothcarp:** 1 and 2, Mr. J. Woodcock; 3, B. Norris, both Blackpool.

**Namidi:** 1, Mr. A. Wardle, Bury; 2, Mrs. L. Newton, Blackpool; 3, Mrs. E. Perrie, Blackpool.

**Catfish and Loach:** 1, Mr. J. Woodcock, Blackpool; 2, Mr. D. Ince, Chorley; 3, B. Norris, Blackpool.

**AOV (not classified):** 1, Mr. H. Loder, Burnley; 2, Mr. J. Peck, Blackpool; 3, Mr. R. R. Walsh, Blackburn.

**Class P. Breeder**  
**Coldwater:** 1, Mr. N. L. Wilkinson; 2, Mr. V. Fletcher, both Blackpool.

**Fishbearer:** 1, Mr. J. Woodcock, Blackpool; 2, Mr. F. Taylor, Burnley; 3, Mr. J. Peck, Blackpool.

**Egg-layers:** 1, Mr. C. A. Blake, Rochdale; 2, Mr. F. Holden, Blackpool; 3, Mrs. M. Faber, Blackpool.

## Dagenham Town Show—Aquarist Section

A VERY successful aquarist show was staged on 28th and 29th August, 1954 at the Central Park, Dagenham, under the auspices of the Dagenham Borough Council. Two local clubs, Dagenham Aquarist Society and the Hornchurch and District Aquarium Society, erected and finally dismantled the equipment in the show; the third local club, Romford Aquarists, assisted in swelling the record class entries. The judging was by Mr. R. Mealand and Mr. C. Creed (F.B.A.S. judges) and the standard of fishes and furnished aquaria was reported by them as being exceptionally high. The following is a list of classes and winners—

**Class 1. Tropical Furnished Aquaria**

1, F. Ahrens; 2, G. Carter; 3, C. Affection.

**Class 2. Coldwater Furnished Aquaria**

1 and 2, L. Land; 3, P. Campbell.

**Class 3. Breeder—Livebearers**

1, G. Carter; 2, F. Ahrens; 3, A. Brooks.

**Class 4A. Breeder—Egg Layers (Tropical)**

1, F. Ahrens; 2, J. F. English; 3, W. Gawler.

**Class 4B. Breeder—Egg Layers (Coldwater)**

1 and 2, F. Balaam.

**Class 5. Fancy Goldfish**

1 and 3, F. Balaam.

**Class 6. Guppy**

1, A. Brooks; 2, B. Ashman; 3, A. Parsons.

**Class 7. Swordtail**

1, W. Gawler; 2, F. Ahrens; 3, W. Gawler.



## Aquarium Tableau

A NEW publicity venture for the hobby was the aquarium tableau pictured above, entered by the Romford Aquarists' Society in a local carnival. The 12 ft. by 6 ft. by 6 ft. frame was made of 2 in. by 2 in. timber and mounted on a lorry. On the floor was placed gravel, planted with some clumps of garden irises. "Rocks" were included by stretching wire netting over rough wooden frames and covering this with painted papier-mache onessian. Taller plants resembling Vallisneria started life as pond rushes; these were forced into cocoa tins nailed to the aquarium floor so that they formed rigid bunches and the tin holders camouflaged. Hardboard cut-outs of tiger barbs, zebra fish, danios, harlequins, angels and guppies, etc., suspended from thin wires crossing the aquarium frame supplied the fish life. Secretary Mr. R. Alley writes that the whole tableau was put together at very small cost, by the enthusiasm of society members, and suggests that other societies may like to copy this original and attractive method of display. In most carnival processions a lorry and driver will be provided without cost by the organisers, so that Romford's idea is certainly worth filing for reference by societies out for publicity next year.

## Hendon A.S. Show

AWARDS at Hendon and District Aquarist Society's show this year numbered 132, and these were presented to owners of winning fishes from the 1,000 and more on show by Mr. Spike Milligan, a radio personality who was in turn given a fully furnished tropical aquarium by the society. Best coldwater fish in the show, a fantail goldfish, won a silver cup for Mr. W. H. Gooderham, and Mr. K. Fawcett was awarded another silver cup for his perma black mollie, best tropical fish.

## Romford A.S. Show

ROMFORD A.S. annual open show was held in August, and reverted to a one-day event after being held for three days in previous years. This justified itself, as more visitors attended in the one day than the total attendance for three days last year. A feature of the show was a marine aquarium containing small soles, plaice, a pipe fish, shrimps, starfish, and a variety of sea anemones. This attracted much public interest and earned congratulations for Mr. G. George, who set it up. Results were as follows:—

**Inter-Club Furnished Tropical Aquaria**

1, Forest Gate A.S.; 2, Romford A.S.

**Individual Furnished Tropical Aquaria**

1, F. Ahrens; 2, C. Ahrens; 3, E. Thompson.

**A.V. Male Guppy**

1, A. L. Collins; 2, Mrs. D. M. Baker; 3, R. Alley.

**A.V. Female Guppy**

1 and 2, R. Alley; 3, L. A. Elliott.

**Mollie**

1, F. Ahrens; 2, Mrs. D. M. Baker; 3, P. J. Rowland.

**Platy**

1, F. Ahrens; 2, W. E. Gawler; 3, A. L. Collins.

**Swordtail**

1, 2 and 3, W. E. Gawler.

**A.V. Barb**

1, W. E. Gawler (clown barb); 2, F. Balaam; 3, W. E. Gawler (zigzag barb).

**Danio, Rasbora, Minnow**

1, C. E. Berkley; 2, E. Gower; 3, C. Ahrens.

**A.V. Characin**

1, F. Ahrens (Anostomus); 2, J. C. Wilson; 3, R. Budd.

**Siamese Fighters**

1, A. L. Collins; 2, W. Corby; 3, F. Balaam.

**Labyrinth**

1, F. Ahrens; 2, G. Bunton; 3, F. Balaam.

**Dwarf Cichlid**

1 and 2, F. Ahrens; 3, A. E. Falkus.

**A.O.V. Cichlid**

1, 2 and 3, F. Ahrens.

**A.V. Tropical Catfish**

1, F. Ahrens (Plectostomus); 2, F. Ahrens; 3, R. D. Morgan.

**Egg-laying Toothcarp—1, 2 and 3, F. Ahrens.**

**A.O.V. Tropical Fish**

1, F. Ahrens (archer fish); 2, F. Ahrens (clown loach); 3, F. Ahrens (Malayan angel).

**Breeder—Egg-layer**

1, D. R. Butler (*H. venusta*); 2, R. D. Butler (*H. heteromorpha*); 3, A. E. Falkus (*Belmisia signata*).

**Breeder—Livebearers**

1, F. Ahrens (red platies); 2, F. Ahrens (*P. varians*); 3, D. Milton (red wagtails).

**Platy**

1, F. Ahrens; 2, E. Thompson; 3, F. Ahrens.

**Livebearer Challenge Class**

1 and 2, F. Ahrens; 3, W. E. Gawler.

**A.V. Egg-layer—1, 2 and 3, F. Ahrens.**

**Grand Challenge**

1, 2 and 3, F. Ahrens.

**Best Fish in Show**

F. Ahrens (*Astronotus ocellatus*).

**Best Junior Entry—C. Ahrens (tiger barb).**

**Special Award for most points won**

F. Ahrens.

The Show was judged by Mr. C. J. Saunders, B.Sc. There was a fall off in entries for the Furnished Aquaria classes, which were poorly supported, but otherwise entries compared well with previous years. Mr. F. Ahrens carried off 18 Cups with a range of entries that were far too good for the other competitors. (Report from Pres. Officer, Romford Aquarist Society.)

## M.A.A.S. Rally

ON Sunday, 12th September, members of societies affiliated to the Midland Association of Aquarists' Societies travelled from places as far apart as Burton-on-Trent and Cheltenham, to join more local members at Dudley Zoo for the Association's Annual Rally. Favoured by the sun, some 300 Aquarists were able to enjoy the attractions of the Zoo and its Aquarium, in addition to attending the Association Meeting. After a short speech of welcome from Mr. Donald Ridsden, Curator of Dudley Zoo, Mr. T. L. Dodge spoke of the work of M.A.A.S. He was followed by Mr. Walter Page, who had some sound advice to offer, both to societies and to their regional associations. He congratulated the M.A.A.S. on its continued growth, but expressed the hope that the Association would not be allowed to grow so much as to become unwieldy. In its present form M.A.A.S. was an example to groups in some other parts of the country. As regards societies, he wondered if sometimes we did not devote too much time to aquatic politics at the expense of our fish-keeping. An appeal by the Chairman of M.A.A.S., Mr. Harold Cadwallader, for active co-operation from society members, was echoed in a most interesting speech by Mr. T. Lee, Chairman of the Belle Vue Aquarists' Society and a member of the Council of the F.N.A.S., who spoke of the work of his Federation, of their difficulties and of their plans for dealing with them. Mr. Lee mentioned the disadvantages of having too many societies of too small a size, with the consequent multiplicity of shows and excessive demand for lecturers and judges. While the idea of regional groups was good there was a possible danger in attempting to cover too wide an area. The mere payment of a subscription was not all that was required of affiliated societies. Active help from society members was even more important. Members attending the Rally will echo the hope, expressed by Mr. Ridsden, that this will be the first of many such events. (Report from Press Secretary, Midland Association of Aquarists' Societies.)

## F.B.A.S. News

IN the latest issue of the F.B.A.S. Bulletin it is announced that an aquarist's tie has been designed and that orders for this can now be placed with the secretary (Mr. R. O. B. List, 1, Coronation Court, Willesden Lane, London, N.W.6). The tie is dark blue with white Siamese fighters as a pattern, in rayon (12s. 6d.) or silk and rayon (15s. 6d.). The Federation also announces that, as a result of negotiations with the British Transport Commission, fishes may be sent to shows under the current facilities for livestock, which have previously excluded these animals. Exhibitors can send fishes to a show and have them returned by British Railways at the rate of a single fare plus a half of the single fare for the return journey, providing the date of the show has been registered in advance with the British Transport Commission (Commercial Committee, 203, Eversholt Street, London, N.W.1) by the show secretary. The Public Relations Committee of the F.B.A.S. organised a television appearance of Mr. A. Fraser-Brunner last month. Annual General Meeting of the Federation is to be held on 11th December, and nominations from member societies for candidates for the forthcoming vacancies of chairman, services secretary and one council member are requested by the secretary not later than 19th November.

## International Congress in Belgium

AQUARISTS from several countries were invited by V.A.A.T.V. (the Antwerp Association of Aquarium and Terrarium Keepers) to a conference held in connection with the "Wonderland" Exhibition, opened on 4th September in the Festival Hall at Antwerp. Britain was represented by Messrs. A. Fraser-Brunner and C. W. Creed; France by M. and Mme. Rothenburger; Holland by Dr. Lodewyckx, Mr. Veldhuizen, Dr. de Witt and others;



## The Aquarist's Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained at cost price by all readers of *The Aquarist*. The design is pictured above (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 1s. 9d. together with the Aquarist's Badge Token cut from page 1x, to Aquarist's Badge, *The Aquarist*, The Butts, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

Luxembourg by Dr. Richard, Germany by Dr. Hans Keller and others; the Saar by M. Feys, and Egypt by Mr. G. W. Allan. The chair was taken by M. A. Dubois of Belgium. Delegates were received by the Mayor of Antwerp in the City Hall, and a very full programme was arranged for them, including not only visits to the "Wonderland" Exhibition, but to other places of interest and social functions. The discussions at the Congress centred round the World Federation of Aquarists which was formed in Amsterdam in 1952, and a number of suggestions and constructive criticisms were directed to be passed to the Executive Committee of the W.F.A. for consideration. Delegates were informed of the progress and future programme of the Federation, which is now satisfactorily established. It is hoped to include a more detailed account of the conference and of the "Wonderland" Exhibition in our next issue.

## New Societies

**Renistone and District Aquarists' Society** Secretary: Mr. V. Robinson, 61, Victoria Street, Renistone. Meetings: Third Tuesday each month at the Spread Eagle Hotel, Renistone.

**Rhondda Aquarist Society** Secretary: Mr. S. Rosser, 16, Dunraven Street, Treherbert, Rhondda, S. Wales. Meetings: Third Tuesday each month, 7.30 p.m.

**St. Austell and District Aquarists' Society** Secretary: Mr. S. Haynes, Top Flat, 1, Church Street, St. Austell, Cornwall. Meetings: Last Wednesday each month, 7.30 p.m., at the Electricity Board's Rooms, Vicarage Hill, St. Austell, Cornwall.

A NEW society in South Africa is the **Eastern Province Aquarist Society** (Secretary: Mr. T. A. Brigham, 1, Broome Street, Millard Grange, Port Elizabeth, South Africa). Before going to South Africa Mr. Brigham was a member of the Bridlington and District Aquarist Society, and he reports that at the inaugural meeting of his new society 35 members were enrolled. The eminent ichthyologist Professor J. L. B. Smith of Rhodes University has become the society's first president. The society entered a display stand at the August Hobbies Carnival held in Port Elizabeth in August.

## Secretary Changes

CHANGES of secretaries and addresses have been reported from the following societies: **Bromley and District Aquarist Association**

(Mr. A. E. Collyer, 54, Birchtree Avenue, West Wickham, Kent); **Deal and District Aquarist Society** (Mr. L. Nicholson, 69, Downs Road, Walmer, Deal, Kent); **Glasgow Eastern Aquarium Society** (Mr. I. H. Lundie, 327, Crown Street, Glasgow, C.5); **Kettering and District Aquarist Society** (Mr. C. Bullock, 3, Belvedere Road, Kettering); **Melton Mowbray Aquarist Society** (Mr. H. Jackson, Regent House, Regent Place, Melton Mowbray, Leics.); **Mitcham and District Aquarists' Club** (Mr. H. L. Hornsby, 101, Hatfield Road, Central Road, Morden, Surrey); **Smethwick and District Aquarists' Society** (Mr. J. W. Bradley, 52, Church Lane, Smethwick, Staffs.); **South-West Middlesex Aquarists' Association** (Mr. Alec H. Charles, 91, The Parade, Uxbridge Road, Harwell, Middlesex); **Stratford and District Aquarist Society** (Mr. H. Whitaker, 12, New Park Court, 260-272, Brixton Hill, London, S.W.2).

## Aquarist's Calendar

2nd October—for three weeks: **Redhill and District Aquarist Society** show of furnished tropical and coldwater aquaria at the Odeon Cinema, Redhill.

3rd October: **Federation of Northern Aquarium Societies** Autumn Assembly and Show, at Belle Vue Gardens, Manchester. Show open to the public.

8th-9th October: **Altrincham Aquarist Association** first open show. Details from secretary Mr. D. Malins, Holly Bank, Grove Lane, Hale, Cheshire.

22nd-23rd October: **North Birmingham Pond and Aquarium Society** open show at the Alexander Sports Ground, Perry Barr, Birmingham. Schedules and entry forms from show secretary Mr. F. Rooks, 240, Newtown Row, Aston, Birmingham 6.

25th October: **British Herpetological Society** (London Group) meeting, "Reptiles and Amphibians in Art and Literature," 7 p.m., at the Linnean Society's Rooms, Burlington House, Piccadilly, London, W.1.

27th-30th October: **Oldham and District Aquarist Society** fourth annual show (open) at Inskip League Hall, Clegg Street, Oldham. Schedules from secretary Mrs. Vera Tripp, 187, King Street, Oldham.

28th-30th October: **Gloucester and Cheltenham Aquarists' Society** third annual members' show at Empire Hall, Cheltenham.

29th-30th October: **Lancashire Aquarist Breeders' Society** annual open show at Spinners' Hall, Bolton, Lancs. Schedules from Mr. A. Morgan, 363, Wigan Road, Bolton.

For your show—printed gummable labels of fish names and award labels for aquaria are available from *The Aquarist* at small cost.

## Crossword Solution

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

PICK YOUR ANSWER (Solution)

1 (a). 2 (b). 3 (b). 4 (a). 5 (d). 6 (b).

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