

# The AQUARIST AND PONDKEEPER

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## QUERIES

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The Editor accepts no responsibility for views expressed by contributors.



Aquatic shows are featuring more and more furnished aquaria. The above tanks formed part of a line of 96 at this year's Hendon Show

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## Editorial

THERE is one feature of this month's issue of *The Aquarist* which renders it excusable for us to talk about ourselves. For the first time since the war we are including pages in colour as part of the "make-up" of the magazine. Colour plates have been used in recent years only as loose supplements to our pages and these have been very popular with readers, so it is hoped that this new feature will also meet with approval. Unfortunately we cannot arrange for pages in colour to be a regular monthly appearance at present, but our plans for the future are taking into account this desirable means of illustration.

It is, of course, only in colour that full justice can be given to the beauty of our aquarium fishes, although quite apart from the fact that the use of this medium adds very considerably to the present-day high costs of magazine production there is also the problem that first-class colour pictures of fishes are not easy to obtain. We have no hesitation, however, in predicting that the colour photograph of platyfishes which we are including as a loose plate in our December issue will be judged as an exceptionally fine example of this branch of the photographers' art, and in the light of previous experience we advise readers who have not already done so to place firm orders for *The Aquarist* to avoid any disappointment over obtaining our next issue.

TROPICAL aquaria have now become firmly established forms of decoration in many hotels, restaurants and cinema foyers. Several business firms have included them in their waiting rooms, and in fact, where it was once a rare event to see an aquarium on everyday journeyings away from home, these days it is a commonplace. Even so, the element of surprise is still present, for the full and final applications of aquaria have obviously not yet been reached. It was, for example, a pleasant surprise to be faced with a community tank on one manufacturer's stand at this year's Motor Show; in the water a car battery plate served as a diffuser on the air line in demonstration of the plate's porosity. Luxury limousines with built-in aquaria have yet to be produced, but such is the progress we are making, next year . . . ?

# Electricity and the Aquarium-Owner

by DOUGLAS DRAKELEY

IT is generally agreed that it is harmful to fishes to switch on aquarium lighting suddenly in a darkened room. There is, however, very little published information offered as to practical means of overcoming this difficulty. The simplest solution is to use a "thermistor," which is a small, wire-ended component, costing only a shilling or two, and resembling an ordinary wire-ended resistor, as used in radio construction. It has, however, the property of allowing an electric current passed through it to rise to its maximum, not instantaneously, but over a period of two or three seconds. Wired in series with the aquarium lamps, the effect is that when the lamps are switched on, the illumination builds up gradually over this period, which, although short, is sufficient to avoid startling the fishes.

The gadget is obtainable from most radio component dealers in three capacities, suitable for lighting installations of 35 watts (0.15 amp.), 45 watts (0.2 amp.) and 70 watts (0.3 amp.). In order to ensure correct operation, the appropriate wattage of lighting should be accurately observed, if necessary by the combination of lamps of various sizes. The available range of thermistors is neither extensive nor ideal, since they are designed primarily for the radio constructor and not for the aquarist, but for lighting installations of over 70 watts, more than one thermistor may be used, grouping the lamps in such a way that each thermistor is correctly loaded.

It should be borne in mind that thermistors become quite hot, even under normal conditions of operation, and for this reason they should be placed well away from other wiring. In the interests of safety also, it is advisable to protect them with an earthed shield of perforated metal. Thermistors are manufactured by the Brimar Valve Co., Ltd., under the name "Brimistor" and these are sold by dealers stocking valves of this make.

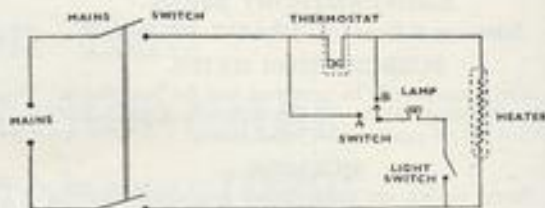
## Thermostats

Most of the popular types of aquarium thermostat are operated on the principle of the opening and closing of a pair of contacts, brought about by the bending of a bi-metal strip which varies according to the changing temperature. The action is accelerated by the action of a small but powerful permanent magnet, which encourages the "snap" action needed to minimise sparking and the consequent burning of the thermostat contacts. Provided that the instrument is not overloaded, perfect operation is assured on A.C. mains, but where a D.C. supply has to be used, the writer has found that severe burning of the contacts is liable to occur, caused by the arc which develops, and often persists between them, as they open and break the circuit.

Most reputable manufacturers, if told that a particular instrument is required for use on D.C. mains, will usually set the contacts, when open, a little wider than usual, to minimise the sparking which burns the contacts, but frequently this does not prove a complete answer to the use of the thermostat on D.C. supplies. It will be found, however, that a 0.1 mfd., 350 volt working tubular capacitor, connected across the lead to the thermostat, will eliminate sparking and contact burning almost completely. Such a

capacitor may be obtained at any radio component dealers for about a shilling.

A further use for the thermostat is the controlling of aquarium lighting when the tank has to be left unattended for a period, as at holiday time. A modicum of light is required for the well being of the plants, as well as the fishes, and yet clearly, the lights cannot be left burning continuously for a period of several days. If, however, a switch is provided which is arranged to switch the lights into circuit with the tank heater, the effect will be to switch on the lights whenever the thermostatically controlled immersion heater comes into operation. Naturally the period for



In this circuit the lighting can be controlled normally, with the switch at "A", or controlled by the thermostat when the switch is at "B". It is important to ensure that the combined wattage of heater and lamps does not exceed the rated wattage of the thermostat.

which the lights are on cannot be fixed by the aquarist, since this is determined by the room temperature, which, in turn, governs the length of time for which the heater is operating—a period which is shorter in summer than in winter. At the least, the lights will operate for a period each day which is long enough to be beneficial to plants and fishes alike.

The writer has constructed an aquarium lighting hood, embodying all the devices mentioned, which are fitted into a metal chassis of the type used by amateur radio constructors. Component dealers supply these cheaply in various sizes and they take the form of a lidless rectangular metal box, large enough to contain both lamps and other fittings. A diagram of the wiring accompanies this article.

It cannot be too often emphasised that all electric mains wiring should, as a safety precaution, be carried out in three-core cable, so that all metal parts, such as the aquarium frame and the lighting hood, can be effectively earthed. In case of the slightest doubt, consult your electrician.

## Dealer's "Green Water"

SOME dealers have tanks the water of which has a delightful greenish cast, although spotlessly clear. These tanks have been treated with acriflavine with a view to eliminating white spot and other troubles. This is in the interest of both the dealer and the customer. The fact that a tank contains acriflavine does not mean that disease is present in that tank—in fact many dealers treat all their tanks in this way.

Quinine sulphate or hydrochloride is also in most dealers' tanks, but this chemical is undetectable. It does not appear to have any harmful effects on the fish.

Raymond Yates



# Building Your Own Fish House—2

by

CUTHBERT L. NICHOLSON

WHEN I left you last month we were up to the eyes in concrete—made of four parts stone chippings, two of sand, and one of cement—and I mentioned that if you use a proprietary brand of waterproof cement you will have floor and walls of undoubted strength and dryness. If you are unable to get hold of any "Aquacrete" or similar cement you can make ordinary cement waterproof by first mixing with the cement powder (pardon the exactness) a cement waterproofing compound such as "Medusa." A 7 lb. tin of the compound is sufficient to waterproof 3 cwt. of cement; this cement will, in its turn, give you 27 cwt. of waterproof wall. You will find a measure in the tin useful and the empty tin is a handy size for fish carrying.

## Working from Base

As soon as the concrete has set hard a good supply of bricks can be carried on to the site and placed about four feet from the edge. This will allow plenty of room to work at bricklaying in front of them and cement mixing behind them, and if you are able to hose a supply of water into a container on the spot you will be saved much carrying. At this stage a small son will also save work if you find him some old leather gloves to protect his hands. Your own hands, if you are a pen pusher by trade, will soon become very sore and cracked unless you wear a leather glove on your brick handling hand. I strongly recommend a proper builder's trowel for the other hand. With a little patience you will find a smart blow with a trowel will neatly halve a brick held loosely in the left hand but if the knack will not come, a hammer and cold chisel will neatly split your bricks exactly where you require the division. You will also find that after the tipping lorry has delivered your 1,000 bricks many



A few courses are required to complete the house wall



Concrete-mixing on the fish house site

of them will be halved, so put them on one side, you will use them all.

## Calculating the Length

Now the distance between the ends of each long wall will be the length of the number of panes of glass you are planning to use along it, plus the number of  $\frac{1}{2}$  in. strips between the panes, plus the number of panes times  $\frac{1}{2}$  in. (clearance), plus the thickness of one end timber. Looking back at the file in which I recorded all calculations I see I worked out measurements for 18 sheets of horticultural glass measuring 24 ins. by 18 ins. thus:—18 ft. + (12  $\times$   $\frac{1}{2}$  in.) glass space for expansion, plus (12  $\times$   $\frac{1}{2}$  in.) rebates, + 3  $\frac{1}{2}$  ins. This gives a measurement from end to end of the laid glass of 18 ft. 10  $\frac{1}{2}$  ins. and the half thicknesses of the end timbers will add another 3  $\frac{1}{2}$  ins., making an overall length of 19 ft. 2 ins.

You will recall that when we were pegging out the site we made it 19 ft. 2 ins. by 12 ft. 10 ins. The side measurement is calculated on similar lines and if you sketch out your fish house on squared paper you will be able to work out how many sheets of glass to order at this stage, but for the moment we are to press on with the bricklaying. Those who are building to my measurements should order 130 horticultural "squares" 24 ins. by 18 ins. costing £7-£8, and if a hundredweight container of linseed oil putty is taken you should make arrangements to return the  $\frac{1}{2}$  cwt. you will probably not need. Never under-estimate requirements. The spare glass and putty are ordered intentionally.

## Bricklaying for Beginners

See that your pegging-out strings are still taut and lay the end bricks of the bottom row first. As an inexpert bricklayer you must gauge, as your two ends of bricks draw towards the centre, just how many bricks you will get into the space and whether to put  $\frac{1}{2}$  in.  $\frac{1}{2}$  in. or  $\frac{1}{4}$  in. of cement between the bricks so as to lay a first row of unbroken bricks evenly. If this is done the upper layers will lie nicely with their joints falling in the centres of those bricks above and those below. Most of us learned to lay bricks by idly watching bricklayers when at school, and no doubt, after the first row or so you will feel happier about this pleasant pastime. I need hardly mention that the first row should be smartly tapped into a level thickness of cement previously chopped well on to the concrete.

No one has failed to watch a bricklayer at his fascinating job so I shall not attempt further to describe the joys of the mix, the scoop, the plop, the chop, the gentle placing of the brick, the tap, tap, tap and the tinkling scrape of the trowel point. I shall just say, do not put too much cement between the bricks and please look often at your own house wall for inspiration—at the corners. Put upright sighting posts some distance away on either side of the wall position and by looking along them often, avoid bulges.

There was a reason for my making the south wall of stone—so that it matches the rest of the garden, and if you do something like this remember to work in a number of long flat stones at intervals, in the corners, to key the stone wall into the brick wall.

If some of your stones are thin and you wish to use them for facing, come up the inside with rough bricklaying to support them and do not try to add too much height to any one part of the wall in any one night or the heavy stones will squeeze out too much cement. The stuff that holds the bricks and stones together? Sorry—mix four parts of soft sand, one of cement, water and mix smooth. Some say lime too, to "fatten" the mix, but I did not use it. There is no need to waste waterproof cement on the outside walls; they do not need to be watertight like the inside skin.

#### Running up the Wall

Eventually—after about a week of nights—you will bring your walls up to a height of 3 ft. and at this point I would like to justify the design of this particular type of fish house. I know there are, perhaps, better designs, for I have previously read of them in *The Aquarist* where contributors have given us, on paper, their good ideas of the perfect fish house. One day I may build an ideal fish house with high double unrelieved walls and a glass roof but this time I had to build something I could live with and with the domestic excuse that it was partly a greenhouse too. I also had to design something to harmonise with the rural surroundings and pass the expert eyes of the ground landlord and the surveyor of the rural district council.

I am not going to drag in any Latin phrases at this stage, however much you, as an aquarist, may be familiar with Latin names, but if you will forgive me having a little rest after the bricklaying there are certain formalities which should be observed, even if you own the property where you live. First of all, have a look at the deeds of your house to see if they say near the end about what you may not do. Some deeds disallow the keeping of hens but as the croaking tetra has not yet made his sound objectionable, the ears of possible complainers have not yet been offended; though you may not be allowed to sell fish and chips, tropical fish still appear to be warmly received all round.

If you own your house and the land is not freehold you will probably pay ground rent to the ground landlord and he is the first man to bless your enterprise. Write him a nice letter, accompanied by a sketch and a stamped and addressed envelope and he will give you his kind approval. The next man to be consulted is the surveyor of the district to which you pay your rates. Send him a similar letter but let your drawing be a little more technical if you can and in addition to the scale drawing show the placing of the fish house in relation to the house. If you are making it 15 feet away from the house, say so. If you are in any doubt, call at the office of the gentleman concerned and you will receive helpful advice from one of his staff who probably keeps fish himself. There is no reason why you should not describe the place as a greenhouse to the odd few who have not yet heard of your hobby.

The council will meet after you have put in your drawing—though not especially—and your plan will be passed. You will receive a letter saying so and there will be various parts of a form to fill in, tear off, and send back as the job speeds along. Your form is actually for houses in construction so

use your imagination when you come to the part which deals with drains and "ready for occupation." You will, I hope, not be spending more than £100 so no building permit will be required under the present arrangement, and if you put a note of the floor area of your own house on the first application the surveyor will advise you whether or not you require consent under the Town and Country Planning Act, 1947. No further consent was required in my particular case.

#### Picking Good Brains

There are few new ideas in the world and I must confess now, that I drew my initial inspiration from a photograph I saw in *The Aquarist* (December, 1951). I wrote to the contributor, Mr. A. R. Prince of Surbiton, saying how much I liked his fish house because it seemed to combine the advantages of a greenhouse with the joys of a fish house and I asked him if he had made it to his own design. He had received many letters from interested readers, and by the time he came to mine and sent me a charming letter and two excellent drawings, I had finished erecting the woodwork. Mr. Prince's place has a refinement I could not bring myself to afford—double glazing—and he made his concrete with a break between the outer wall foundations and the tank bottoms so that any settling of the tanks would not distort the fabric. His centre path runs through to the far end, unbroken by roof supports or gable end tank and his timber edges rest upon the walls where I have made the timber ends rest.

His house is used for coldwater fish, whereas I built my place in the hope that it would house tropicals, and in between popping out to feed the fry being born daily in the large concrete tanks, I am vigorously getting on with the tale and recording what is happening to-day, while the place is still working well. At any rate, when the first disaster happens I shall know why it happened, unless I am electrocuted, and I shall know how to avoid it in the future, if any.

I am off now to record the 11 p.m. temperature of the six concrete tanks (four with central heating) and the seven glass tanks and to compare it with the air and water temperatures of the outside world.

(To be continued)





## OUR EXPERTS' ANSWERS TO READERS' QUERIES

I am a novice fishkeeper, and wonder whether I am doing right in siphoning out the sediment which accumulates on the bottom of my aquarium every few days. I have been told that the plants need the nourishment provided by fish excreta. Is this correct?

It is true that plants derive benefit from fish excreta. However, you should not allow too much of it to accumulate on the bottom. You would do well to continue as before, for most of salts and minerals are absorbed by the plant life long before the sediment is siphoned away.

How many fishes can I keep in a 24 ins. by 15 ins. by 12 ins. tropical community aquarium without artificial ventilation? Which species give the best decorative effect? Which in your opinion is the better thermostat—the completely or the partly submerged?

The decorative effect with inexpensive and hardy varieties should include pairs of zebra fish, mountain minnows, tetras, platys and flame fish among your collection. Your aquarium will support about a dozen pairs of fish of mountain minnow size. With aeration you can keep more, but the aquarium will look overcrowded and the occupants will be cramped for space. Generally speaking, the completely submerged thermostat gives the best results, but it must be pointed out that well-designed thermostats not in contact with the water give excellent service.

I have had some trouble in my tropical aquarium. Brown algae keeps forming on the glass sides, and one of my angel fish seems unable to rise off the bottom. What is wrong?

Algae and brown algae grows only where the light is not sufficiently strong to stimulate the growth of higher plant life. It sometimes the mineral content of the water will encourage it. You should scrape the offending growth off the glass, and plant up with strong growing underwater vegetation, which, when it gets established, will starve the brown algae out of existence. Your angel fish is probably suffering from swim-bladder trouble. You can try raising the temperature of the water a few degrees, but if the fish does not rise, the best thing to do is to put it out of its misery.

Can you give me any information on growing the Madagascar lace plant?

The Madagascar lace plant is not an easy plant to grow. Its ideal requirements are clear water with a slightly acid reaction, a temperature above 75° F., and not too much light. It is best to start it off in shallow water, and set it in deeper water than plant it direct in the aquarium compost. The pot should be filled with a mixture of yellow loam, crushed charcoal and fine grit.

I have two aquariums housed in a cupboard with the front panels out to show the front panels of glass. The top aquarium is heated, and houses tropical fishes and plants. The bottom one is unheated and houses fancy goldfish. The aquariums get little or no daylight, but to make good this deficiency I burn a 50-watt electric lamp over each aquarium during the daytime, and increase the light 15-watts after six o'clock and onward. The tropical tank is planted with Amazon sword plants, Indian ferns, *Carex*, and *Myriophyllum*. The coldwater aquarium contains only *Catfish* and *Sagittaria*. My problem is that the plants in the tropical tank are turning yellow and dying brown, while those in the coldwater aquarium are green and healthy. Can you tell me what is wrong in the tropical aquarium?

The trouble is lack of bright light. You would do better to increase the wattage for your tropical aquarium and cut out some of the daytime illumination. A 100-watt lamp burnt for five or six hours every night would result in a marked improvement in your tropical plants, all of which need a bright light. The reason why the plants in your

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.

coldwater aquarium are doing well is easy to explain. In the first place, *Sagittaria* does not mind rather shady conditions. As for *Cabomba*, this plant always does better in temperate rather than tropical conditions.

Can you give me some information on the conditioning and spawning habits of *Epiplatys chaperti*, and whether there is any difficulty in breeding *Corydoras julii*?

To bring a pair of *Epiplatys chaperti* into breeding condition you should include plenty of live food and minced raw meat in their diet. The temperature of the water should be raised a few degrees above normal. Single eggs are deposited among plant life growing just beneath the surface of the water, and egg-laying goes on for several days. If the parent fish are well fed, and the aquarium is thickly planted, eggs and fry will be left alone. The eggs hatch out within a fortnight. The baby fish need plenty of small food. They will take either live-food or powdered dried food. Fishes of the genus *Corydoras* are not among the easiest species to breed. *C. paleatus* and *C. aeneus* have been bred lots of times in this country and abroad, but the others seem to present all sorts of difficulties which the aquarist has failed to overcome. From what we have learned about *Corydoras* species, they need alkaline water, and a fairly high temperature during the daytime, though a slight fall overnight is said to stimulate the female. Breeders of *C. paleatus* usually condition the fish on plenty of chopped earthworms.

How can I determine the sexes of glowlight tetras (*Hyphessobrycon gracilis*) and black widow fish (*Gymnocorymbus ternetzi*)? I should also be glad of any information you can give me on breeding these species.

Perhaps the easiest way to distinguish the sexes of these fish is to place several specimens in an aquarium and compare body contours and behaviour. You can usually take it that the sleeker-sided fish are males. The males will also do a lot of "driving." For spawning the above species you need shallow, crystal-clear water, a temperature a few degrees above normal and plenty of plant life. *H. gracilis* lays only a few eggs at a time. As a rule, the male drives the female all over the aquarium. Every now and again they stop, lock fins, and do a slow roll on to their backs. As they roll over, the female extrudes her eggs. The eggs hatch out in a few days, and the baby fish need small live food such as fresh cultures of Infusoria, or freshly hatched brine shrimps.

We have a male swordtail which spends a lot of time wriggling on the bottom of its aquarium. Has it contracted some illness or disease?

Male swordtail fish often indulge in queer wriggling movements on the bottom of the aquarium, especially when a female is present. On the other hand, the fish might have swim-bladder trouble, which causes the sufferer to shimmy about in the water. Bad cases soon prove fatal.

I have been told that *Heterandria formosa*, *Lebistes reticularis*, *Platyponchilus variatus*, *Macropodus opercularis*, *Gambusia holbrooki*, *Gambusia affinis* and *Tanichthys albanus* can be kept at a temperature not much in excess of 60° F. I am thinking of starting an aquarium for species which would

do well in a low temperature, and would welcome your advice.

*Tanichthys albomaculata* is the only fish among those you mention which would live and breed at ordinary room temperature. While it is true to say that the other fish are hardier than most, and often endure cool water for short spells, it is unwise to keep any of them at a temperature below 65° F. If you are really interested in room temperature fish, why not give some tank space to the many handsome bass and sunfish at present on the market?

I am worried because my male Siamese fighting fish chases the other occupants of my community aquarium. I bought a female fighting fish as company for him, but I had to separate them after a few days. Now she chases the other fishes. What should I do?

Siamese fighting fish often chase other species, but they seldom do any actual damage. Do not worry unless actual bullying or fin-nipping takes place. Where this is the case, separate the bully or bullies from other fish.

## COLDWATER FISHKEEPING QUERIES answered by A. BOARDER

Do goldfish eat newts? I had several in my pond but they have all disappeared.

Goldfish would not eat adult newts, though they could eat their tadpoles or babies. Newts only go to the water to breed and after this they leave the water and pass their time in damp places such as under stones or dense herbage. You will find that they will come to your pond again next year; look out for them near the end of February—I shall be very surprised if some do not return to your pond then.

I have to supplement my income. Can I do this by breeding *Daphnia* for sale to aquarists? I have a large garden and a stream at my disposal. How can I breed water fleas?

There is a market for *Daphnia* but I think that most of them are collected from ponds and are not specially cultivated. You can of course breed them but the stream would not be the place for this project. It would be almost impossible to make a screen small enough to prevent the tiny *Daphnia* from being washed away, especially as the water would have to pass through it fairly easily. A better plan would be for you to make a series of small shallow ponds near the stream so that water could be run into them at will. Natural mud-based ponds would be better than concrete ones as any leakage could easily be made up from the stream.

To breed *Daphnia* it is only necessary to supply sufficient food, introduce a few *Daphnia* and they will multiply as long as there is any food left for them. Their food consists of Infusoria and algae. This can be propagated by allowing the ponds to become covered with vegetation; you could plant with wheat or similar cereals and then, when fairly well grown, flood with water from the stream. The vegetation would decay and Infusoria would form. When the water looked green you could introduce the fleas. Keep the ponds running in rotation as when the food is used up from one pond the *Daphnia* will decrease in numbers and may even die out altogether.

You will have to keep pests, which might prey on the *Daphnia*, out of the water. It would be possible and an advantage to keep a few ducks in your ponds; their droppings appear to assist the formation of Infusoria. However, you may not be able to continue through the winter in your district, as it is a cold one. *Daphnia* normally lay eggs at the commencement of the winter which last until the next year, when they hatch out. Why confine yourself to *Daphnia* breeding? Why not try some of the other popular live foods? You could breed white worms all the year round and, with a little warmth, micro worms as well. The breeding of many

I am building a tank 37 ins. by 16 ins. by 20 ins. deep. The frame is of 1½ ins. by ½ in. angle iron. I have ½ in. plate glass for the ends and sides; what thickness of glass should I use for the base?

Use 5/16 plate glass for the bottom. Cheap wired glass could be used for the back and for the bottom, so long as it is of suitable thickness.

I am becoming interested in tropical fishkeeping, and wonder whether my unheated conservatory would be a suitable place to set up a tank. I live in Yorkshire, and during the winter the temperature inside the conservatory often falls below freezing point.

As your conservatory is unheated, you would do better to keep your aquarium indoors where you could keep an eye on your fishes, and economise on the heating arrangements. As you are a beginner, we think it would be a good idea if you obtained *Aquarium Technique for the Beginner* (post free 1s. 8d.) from this office.

live foods is dealt with in my book *Coldwater Fishkeeping*, which can be obtained from *The Aquarist*, 2s. 8d. post free.

I have two goldfish which have grown too large for their tank. I have bought a larger one and wish to add two more fish. Which kinds do you suggest as a change; would British coldwater fish do? I think there is a season when the sale of these fishes is illegal, but I cannot find the date.

I suggest that you have a couple of shubunkins to go with the goldfish. You could have one or two small specimens of tench, dace or bleak. These would not get too large for your tank inside about three years. There is no season when the sale of British coldwater fishes is illegal. You have in mind the close season for coarse fishing or angling—this is from 15th March to 15th June, both days inclusive, and is in force so that fish are not caught in the breeding season.

I have a glass accumulator jar, 6 ins. by 8 ins. and 12 ins. deep. I want to keep two or three goldfish in it. What is the correct depth of water; the method of feeding; best type of food; names of water plants to oxygenate the water, and would rain water from the roof do for filling the tank?

As your jar has a surface area of only 48 square inches it will only hold two inches of fish. I suggest that you keep one small goldfish only in it as otherwise you will lose the other fish very quickly. Put as much water in as you can and this can be kept at room temperatures—there is no need to heat for goldfish. You can feed with one of the prepared packet foods and an occasional small earthworm will be sufficient. For plants you can use a clump of *Vallisneria spiralis* var. *torta* or a fair-sized bunch of *Lagarosiphon major*. Tap water is much better to use than rain water. This would be badly fouled if caught from a roof and is better left alone. I only use tap water for my fishes.

I have large ponds near London and have in mind a project to get together a representative collection of all the known water-lilies and many other water plants so that the ponds can be open to the public for a small fee. Do you think this a good idea? Also I propose to have specimens of types of goldfish and other coldwater fishes on view. I have in the past been troubled with kingfishers and herons; is there a way of preventing loss from them?

Your idea is an excellent one. If such a collection of plants were on view I feel sure that many aquarist societies would run outings to your ponds where they could see and purchase the various water plants. Some fish-breeding establishments are already open to such societies, usually



without let, and it is possible that for recognised outings the fee could be waived as you would probably make many sales to compensate you for your trouble, although I realise that a fee must be charged to the general public.

As for the anticipated trouble from kingfishers, it is a great help to see that there are no overhanging boughs of trees or shrubs adjacent to the water which could serve as perches for the birds, but I have seen kingfishers hover over the water like kestrels before diving for a fish. The fact that you would be growing many water-lilies would mean that a great deal of the surface of the water would be covered by leaves. This would give much protection for the fish. Herons do not as a rule alight in the water. They prefer to sleep on the ground near the water's edge and wade in after the fish. If a series of trip wires could be arranged around the pond they would tend to scare the birds off. I have in fact used fine black wire we used to use for wireless sets over a pond. Any way, good luck to your project and I hope to visit the ponds when ready.

I wrote to you recently because my goldfish remained at the bottom of their tank and only came up for food. I have now found the reason. I had two black elephants standing in front of the tank and since I have moved them the fish swim about in a normal way. What was the reason for the fish lying all the time at the bottom and then swimming around when the elephants were moved away?

The sounds like a bit of black magic, but I think the reason is fairly easy. The black elephants provided some shade or shelter for the fishes. Most fishes are of a retiring nature and generally take advantage of any available shelter from enemies. The elephants provided the necessary shelter and when removed the fishes were forced to move around, there being nowhere for them to hide up. If you place a shelf of stones in the tank the fish will very soon find their way under for shelter from prying eyes.

Will white spot survive the winter? There appears to be a lot of this around here and it has been reported from natural ponds and canals in the district. Cannot a group be formed to study this complaint?

It has been said that white spot is not native to Britain and that it can only be introduced from abroad. If your statement is correct, that it is found in the wild, it may become a menace. As to whether it can withstand a winter, this must be a matter for conjecture at present. A good deal is already known about this parasite (*Ichthyophthirius multifiliis*), and it develops very slowly in cold water. When a fish is attacked by the parasite it appears to form a skin over it which makes it practically impossible to kill without killing the fish. However, at a temperature of 70-80° F. the parasite develops quickly, in about three days, and leaves its host. It falls to the bottom of the water and encysts. In a few hours at a warm temperature it divides and many more parasites swim about in search of a victim. If they are unable to find one they soon die. At a temperature of 50° the parasite takes at least four weeks to develop and the division of the cyst also takes much longer. It is well known that cold retards the development of the pest, it is possible that a severe winter would kill it.

The free-swimming parasites have been killed by at least three methods: quinine hydrochloride, methylene blue and potassium hydrochloride tablets. The removal of the fish from an infected tank once the pests have left the fish means that the tank should be safe for more fish after about a week providing the temperature of the water in the tank has been raised to about 70° to hasten the development of the pest.

You could start a study group in your society with reference to the spread of the pest in natural waters. Unfortunately I have found that in practice these study groups start off with plenty of enthusiasm but after a time nothing happens. Either through lack of specialist knowledge,

lack of good microscopes or lack of time the project falls through. I know that many aquarists would do far more in this line if they had the time. Most of them are too busy trying to get a living to be able to spend much time on special studies. I consider that the only place where such a study would be possible is at a University or similar institution where time and money could be devoted to the work.

My pond has been made since 1946 and has been healthy. I have added no fresh fish or plants yet the pond is now infested with leeches and I have lost some fish by them. How can I get rid of the leeches, where did they come from and why is it that none of the shubunkins have been attacked?

Some leeches lay their eggs in the form of a cocoon on stones or plants whilst others lay them in the damp surroundings of the pond. Eggs may have been introduced on plants by birds. Also I see no reason why the type which leaves the water to lay its eggs could not travel a short distance overland in wet weather. If you empty the pond many leeches could be caught. They can also be caught by lowering a piece of meat or fish into the water and leaving it there all night. Many leeches attach themselves to the bait when they could be destroyed. I do not know why the shubunkins were the only ones not attacked by the leeches, except that they may have been more active. I feel that only those fishes which periodically lie on the bottom of the pond are likely to be attacked, but I may be wrong in this surmise.

I have a coldwater tank well planted with *Elodea crispata*, *Vallisneria*, *Sagittaria* and *Ludwigia*. I want to convert it to a tropical tank by adding a heater. Will the plants survive or must I remove them and get tropical plants?

The plants you mention will grow quite well in a tropical tank. In summer weather these plants have to put up with temperatures well over 70° and appear to come to no harm, in fact they make prolific growth. You may find that some of them will need pruning now and then. You could always remove any that did not thrive and add one or two tropical plants. The *Ludwigia* will probably do better than when the water was cold.

If I put catfish in my pond will they harm the goldfish?

There is no reason why catfish should harm the goldfish, but some types grow to a large size and then they may not be as harmless. I consider the green tench to be the best scavenger for a pond and it is quite harmless to goldfish.

I have been told that a piece of coal in an aquarium keeps the water quite clear. Would coal keep a pond clean and if so, how much to the gallon of water?

A tank can be kept clear without coal and this applies to the pond as well. Keep the coal for the home fires and you can keep your pond water clear by not over-feeding the fish and by providing some shade from the full sun, such as by using enough water-lilies.

I have been troubled with fish lice on my fishes in the pond. I have got rid of many by the methods you recommend. Where do they come from?

Fish lice, argulids, usually lay their eggs (many of them) on a stone or similar object. It is possible that they may sometimes lay them on stems of water plants which could be carried to your pond by birds. As a rule they are introduced into a pond on a new fish put in the pond. I have found that if the fish are caught from the pond once or twice in a season and cleared of the pests at monthly intervals the pests can be eradicated from the pond.

# Alexandra Park Aquarium, 1874

by L. R. BRIGHTWELL



The old Manchester Aquarium in Alexandra Park as it was in 1874

("Hans Breitmann gif der party—where was dat party now?")

THERE is always a thrill in lighting on a collector's piece of aquarium literature. One such came my way the other day, during a business trip to Belle Vue Zoological Gardens, Manchester. It was the guide book to the vanished aquarium of Alexandra Park, published at sixpence, and now not to be had for many times that sum.

This guide (1874) ran to 81 pages, and was enlivened with extremely homely woodcuts, though no worse than most "modern art." It was written by the Superintendent, Saville Kent, one of the strangest figures in the whole history of aquarium-keeping. The most zealous biographer has not yet pieced together a satisfactory history of this extraordinary man. He seems to have spent part of his life founding great public aquaria, then coming to loggerheads with his associates and drifting elsewhere to embark on some other spectacular adventure. He was the mainspring of Brighton, Crystal Palace, Westminster and other underwater zoos. Then he charted, described and pictured the teeming life of the Great Barrier Reef throughout its thousand-odd miles, produced another vast tome on Australia's inland fauna, pioneered in cultured pearls, kept koalas in his St. John's Wood flat, and was finally laid to rest in Millfold Churchyard, Hampshire, with some huge coral branches above him. A grave unique as the restless, ever-searching spirit it commemorates.

## "Votaries of the Weed"

Coming back to the guide book, it was a little florid in manner, for paper was cheap in 1874. It describes in detail the occupants of 68 tanks. There were thousands of sea fishes and invertebrates, a fine collection of cold freshwater, not a few "trops." Two sizable reading tables gave visitors a chance to really study the guide—and rest "the poor old feet." Their grosser needs were also catered for. A refreshment room "tastefully decorated and replete with every delicacy in most demand by visitors from a distance, or others whose interest in the marvels of the tanks had

tempted the devotion to many hours in their contemplation. Smoking not being allowed or desirable in the saloon or corridors, a special room for the accommodation of votaries of the weed has been fitted up in connection with the refreshment room."

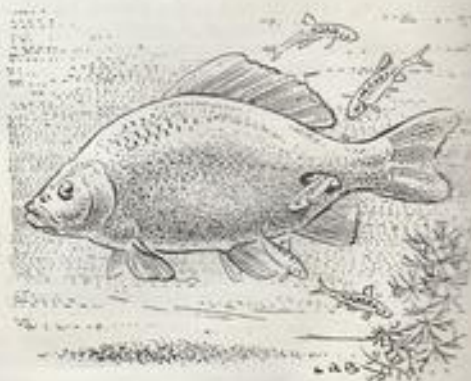
A bit heavy perhaps, but what a period that was for aquarists. Manchester's aquarium was only 60 feet above of Brighton's 740, then came Southport with 500 feet, the Crystal Palace 390, Blackpool 250, London Zoo 100. . . . Blackpool also still stands, and with it the semi-Government supported Research Stations of Plymouth, Callernish, Millport, Port Erin. The others . . .

Mancunians of 1874 could see some monster fishes. There was a Royal sturgeon nearly nine feet long, and a monk (*Rhina squatina*), so large that it inhaled two two-foot cod at a sitting, and so mauled a seven-foot shark that it succumbed. Unique too was a big carp which sustained an injury leaving a big hole at the root of the tail. The edges of the hole healed, but an inch-wide aperture remained. Minnows in a hurry used to swim through it, in single file!

The hidden hand behind this aquarium was a Mr. Lloyd, another giant awaiting a biographer. He had built the Hamburg, Crystal Palace, Westminster, London Zoo Aquariums and many others, had a large aquarists' warehouse at 10, Portland Road, Regent's Park, and issued a combined catalogue and treatise on aquaria, 134 pages, 75 woodcuts, price 6d. He would get you anything, from a 14 h.p. steam pump to a live shark, or a bevy of sea-horses.

Mr. Lloyd was full of ideas, and would that space permitted of his more ambitious illustrations. One transcribed shows how he tackled the problem of small-scale circulation. The tank floor proper was cocked up at an angle, so that the space below served as a reservoir. As time allowed you pumped this into the exhibition hall above, by means of a little squeeze gadget "complete in

(Please turn to page 171)



Minnows swimming "follow-my-leader" through the mauled carp





*A page for  
the beginner  
contributed  
by  
A. BOARDER*

**T**HE end of the year is quickly approaching and many aquarists may think that there is nothing for the cold-water fishkeeper to do. This is not so and, in fact, there is no month in the year without a particular task for the one who would be successful. I promised to deal with the cleaning of the out-door pond this month and will do so after dealing with one or two points regarding the young fish bred this year.

For those without artificial heat the growing period will be over, as the fry will not feed as regularly or as well as they did when the temperature of the water was about 60° F. It will be noticed that as the water gets colder so will the fish become quieter and feed far less. It is imperative that food is reduced greatly from now on as there is no sense in giving food which the fishes will not accept. You will probably find that the fish will feed best at about mid-day or early afternoon. I think that a feed once a day is enough; only give as much as can be cleared up quickly.

#### Aquarium Attention

If any garden worms can be found they will make the winter food for the youngsters, especially if the worms are chopped up fairly small. By now you should have sorted over all the fry and then it is possible to give the better ones more room so that they have the best chance of growing into healthy fish. If you are breeding any particular type of fancy goldfish variety it is essential to study the necessary stages so that only the very best receive the maximum space. Where fishes are kept in tanks it is advisable to clean out as much mulm as possible from the base of the tank, as the plant life, not being as active in the cold weather, will clear up less with the result that the water may become foul. It cannot be expected that water plants will continue to grow once the temperature of the water drops below 50°. If you have been using any form of aeration it may now be possible to reduce this considerably as the cooler water will not lack oxygen as did the warmer water you have been using throughout the summer.

#### Pond Fry

This month is when you must remove the small fry from the outdoor pond unless the pond is a fairly large one. You cannot expect the fry to go through the winter safely in a tiny pond as the water will be subject to sudden changes of temperature as well as being in danger of freezing up badly. The best time to catch the fry from the pond is when you empty it for the annual cleaning. This is best carried out some time during November, and it must depend to a great extent on the weather. It is quite hopeless to try to clean out the pond except in good weather. Previous to the usual emptying, much may be done to help matters by netting from the surface of the water as many fallen leaves as you can. Some will always drop to the bottom but a lot can be removed whilst still floating. Water-lily leaves should have all died off by now and I usually remove as

many as I can as soon as they turn brown. It is surprising how a rotting leaf can pollute the water, and lily leaves are as bad as any for this.

Whether you clean out your pond will depend on its size and composition. I think that it is advisable to clean out all concrete ponds, but if a pond is a natural one it will be almost impossible to clean it out thoroughly. If a natural type pond is left for too long however, without a clear up, it is possible that it may gradually silt up with mud and decaying leaves and lose most of its depth. With such a pond it is better to try to drag out much of the mud from the bottom together with a good deal of the plant life. In a pond with a natural mud bottom it is amazing how well the water plants grow; in a few years they can have grown out of hand and have choked the whole water area. Therefore, unless something is done every few years, the amount of water in the pond gradually decreases and a bog will form.

#### Annual Clean-up

The concrete pond is so much easier to clean out and, in my own experience, I find that it pays to clean out the pond every year. When commencing the task it is as well to have some large tanks nearby so that the fishes can be placed in them whilst the pond is cleaned and also so that the fish may be examined well before being replaced. If your pond is one with a plug in the bottom for emptying, it is a great help, as long as a screen of some kind is over it to prevent fishes from being washed away. If there is no plug the emptying can be hard work. Where there is a lower part of the garden the water can be siphoned out. Otherwise, it will be found helpful to use a small electric water pump. I use one myself but it still takes about three hours to empty the pond and then there is always plenty of black mulm which must be moved with a bucket.

Do not try to catch the fish until a good deal of the water has been removed and after most of the plants have been taken out. I always recommend that plants are set in containers so that the whole can be lifted from the pond with comparative ease. My method is to slide the pots up the side of the pond and then leave them just clear of the edge. During the first stages of cleaning out it is better to work as steadily as you can so that the water is not disturbed too much. You will appreciate the reason when you start to catch the fish, which may be done when a large proportion

#### Post-Mortem Examination of Fishes:

W. Harold Cotton, F.Z.S., 39, Brock Lane,  
King's Heath, Birmingham, 14.

Specimens should be sent direct to Mr. Cotton, with full particulars of circumstances, and a fee of 2/6.

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 greaseproof 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.



"I knew he wouldn't be happy until he could get in there with them"

of the water and the plants have been removed. Place them in the spare tanks with some of the water from the pond. If the fishes are of a lively kind, see that a cover is placed over the container or the fish can jump out.

When most of the water has been removed from the pond it will be found that there is a large quantity of black, evil-smelling mud at the bottom. This should be scooped out; a milk saucepan on a long handle will do and it should be strained through a net. It is surprising how many young fish may be found in this mud. Once most of the mud has been removed the pond may be scrubbed round with a stiff broom. The hose should be played with force round the sides at the same time. I like to see the whole of the concrete quite clean before I attempt to re-fill. When you are satisfied that all is clean, examine for any cracks. I have dealt with methods for stopping up cracks before but will add here that if any form of bitumen stopping is used the crack must be dry before being filled. The very property which makes it water-proof also means that it cannot adhere to anything wet. Some cracks can be stopped with cement well forced

in but this has a tendency to break away in time, especially if the pond freezes over fairly thickly.

While you are refilling the pond from a hose it is a good time to look over the water plants. It may be found that some kinds have grown too large and so portions can be cut off. Where many roots have come over the sides of the pot they need not be cut away as they can assist in keeping the water clear. Once you have sufficient water in the pond the plants can be replaced. Then take the temperature of the water; I do not suppose that you will find a variation of more than a few degrees from that of the tank. If the temperatures agree fairly closely the pond is ready once more for the fish.

Have a large white bowl with clean water handy and as each fish is caught it can be placed in the bowl for examination. See that there are no argulids (fish lice) on them and that they are in good condition. Do not put any fish of this year's hatching back into the pond if you are breeding a particular type of goldfish. Keep them in reserve somewhere where their progress can be watched. If only one bad type fish is left in the pond it can do much harm in spoiling the strain the following year. This is one of the main reasons why I empty my pond each year—so that only the near perfect fish are left in the pond to carry on the strain. If you are not worrying about keeping your strain pure, or if it is mixed in any case, the larger youngsters can be put back in the pond for the winter as long as the pond is not too small. I think that it is better to keep them apart if you can so that once they have completely changed colour it can be seen whether they are worth adding to the stock.

As you return the fish to the pond keep a record of the numbers and kinds and, if you are statistically minded, add a rough measurement of each. Should you require to weigh any of the fish this is best done by placing the fish in a wet linen bag. The weight of the wet bag can then be deducted. The fish will come to no harm if out of the water for a short time, especially in the wet bag. Once the fish are back in the pond make up your mind that you are going to be especially careful with all feeding from then on. It is not at all difficult to keep the pond fresh and clear at this time of the year as long as nearly all food is withheld, and I feel sure that all dried foods can be stopped altogether with advantage.

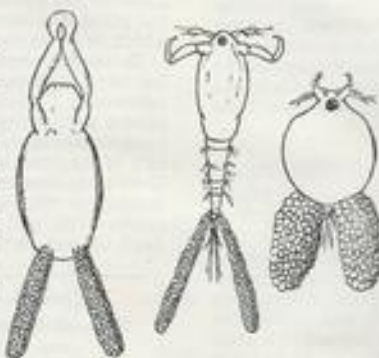
## FRIENDS & FOES No. 8

### PARASITIC COPEPODS

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

CLASS:—Crustacea, from Latin *crustaceus*—having a shell.

THERE are several species of parasitic copepods in Great Britain which breed in fresh or slightly brackish water. The largest is the "gill-maggot" (not a gill-worm) of the salmon. This reaches a maximum size of just under one quarter of an inch. The smallest is a tiny creature—no larger than one-fiftieth of an inch—which sometimes infests the stickleback. Between these two extremes are two copepods each about one-eighth of an inch—one attacking grayling and the other trout, and a third confining its attentions to the grey mullet. This last is no larger than one twenty-fifth of an inch. One and all attack the gill regions of their hosts.



Egg-filled, transparent sacs are shed by the female copepods. These fall to the bottom of lake, river, or estuary, and hatch in a few days. When first hatched they are called nauplii, and bear no resemblance to their parents.

### Parasitic Copepods

Unfortunately they are identical with the harmless nauplii of many non-parasitic species. At each moult they take on more of the appearance of an adult parasite.

They are free-swimming until they find a host, and may easily be netted out with other live fish foods and introduced into garden pool or aquarium. So far I have been unable to unearth evidence that under such conditions they will attack species other than their normal hosts. It may well be that they themselves are consumed by the fishes or perish of starvation. If any reader believes that his fishes are suffering from the attentions of these parasites, reference to the diagrams above may help him to come to a decision. I shall be pleased to receive information on this point.

C. E. C. Cole



# Inheritance in Aquarium Fishes

## 2. Mendelian Inheritance in Platy Breeding

by Dr. MYRON GORDON

(Geneticist, New York Zoological Society)

As related in last month's article, the matings which lead to the creation of the wagtail platyfish involved the following:

1. The mating of a comet-patterned wild platy with another platyfish without that pattern, both of which were obtained in Mexico from the same natural population.
2. The mating of a comet-patterned wild platy with a member of a long-domesticated strain of goldplatys.

You will recall that a comet platy mated with a platy lacking that pattern produced all comet-patterned hybrids. These comet-patterned hybrids when bred brother to sister produced three comet-patterned young to every one without that pattern.

The results which I obtained from the mating of comet and non-comet platyfish may be explained readily on the basis of two Mendelian principles of inheritance which are:

1. The hereditary factors segregate in the reproductive cells of the parents.
2. The hereditary factors recombine in their offspring.

Using the Mendelian concepts, the comet parent (let us say it is the male parent) furnishes reproductive cells, or sperms, each of which carries the dominant hereditary factor for comet which we will designate as *Co* (capital letter). At the same time, the non-comet-patterned platy (let us say it is the female parent) furnishes reproductive cells, or eggs, each of which carries the alternative recessive hereditary factor which we will refer to as *co* (in lower case).

### Hereditary Factors of the Comet

Remembering that every bisexual produced organism is in reality a dual entity, the pure or homozygous dominant comet platy may be represented by two genetic symbols: *CoCo*, and the non-comet parent, by the same token, be represented by two factors indicated by *coco*. The mating between *CoCo* and *coco* genetically constituted parents produced comet-marked *Coco* offspring.

At the time the matings were being made I found that it did not make any difference whether the comet (*CoCo*) platyfish was the male parent and the female parent the non-comet (*coco*), or whether the male parent was non-comet (*coco*) and the female parent was the comet (*CoCo*). In both instances all comet (*Coco*) offspring appeared in the first generation.

Now then, when I bred the two hybrid comet-carrying platyfish brother to sister, I could represent this mating conveniently as follows:



I could predict the number and kind of offspring produced in the second generation by the visual aid devices of the squares. The rules, to repeat, are as follows: above a series of squares, place the types of reproductive cells produced by the male parent (these are also called gametes). Since the male's genetic constitution is *Coco*, he produces *Co* and *co* male gametes in equal numbers. Similarly, the

A colour chart overpage shows the sequence of crosses made by the author to produce the golden wagtail platy

female parent being *Coco* produces *Co* and *co* female gametes in equal numbers; these are placed along the left-hand series of squares as follows:

		Male	
		<i>Co</i>	<i>co</i>
A.	Female		
	<i>Co</i>		
	<i>co</i>		
		B.	
		<i>CoCo</i>	<i>Coco</i>
		<i>Coco</i>	<i>coco</i>

Now, one merely combines the various pairs of male and female gametes as indicated in B. (For the exercise, fill in the empty squares in diagram A and see whether you can get the same results as are indicated in diagram B.) When the recombinations are summed you should get one *CoCo*, two *Coco* and one *coco*. Since the *CoCo* and *Coco* types each produce the comet pattern, there are three comets to one non-comet.

### Example of Simple Mendelian Inheritance

Many years ago I found the first example of this relatively simple type of inheritance when I mated a goldplaty to the wild grey type. I discovered that in the first generation all the hybrid young were grey like their grey parent. When I inbred the grey hybrids (brother-sister mating) I obtained, in the second generation, approximately three times as many grey platyfish as goldplatys. (See diagram on page 168.)

This experience with gold and grey platyfish was easily explained on the basis of Mendelian principles of inheritance, for the results were quite similar to the comet—non-comet matings just described, or to go back to Mendel's experiments, the results were similar to the one he made with tall and short sweet pea plants.

For the purpose of emphasis, at the expense of repetition, this gold-grey platy experiment ought to be worked out in detail and explained in Mendelian terms. Let us say that the gold colouring of the goldplaty may be referred to as the recessive gene *gg* (in lower case), while grey may be regarded as the dominant gene *GG* (capital letters). When the goldplaty (*gg*) was mated to the greyplaty (*GG*) all their offspring were grey and each hybrid had a heterozygous combination of genes: *Gg*.

Let us determine by use of the Punnett square method what kind and how many of each kind of platyfish would be produced in the second generation when the heterozygous grey hybrids were mated together, that is, *Gg* × *Gg*. The male grey hybrids will produce sperm half of which would carry the *G* gene and others the *g* gene. This would also be true of the eggs produced by the female, that is, about half of the gametes would be carrying the *G* gene, the other half *g*. When the *G* and *g* gametes are arranged properly above

## Inheritance in Fishes

(Continued from preceding page)

and to the left of the squares, as indicated, their recombinations may be easily determined.

		Male	
Female		G	g
G		GG	Gg
g		Gg	gg

Within the four completed squares there are one GG and two Gg combinations which when, added, represent three greyplatys. Then there is one combination of gg; this represents a goldplaty. Thus there are three greys to one gold in the second generation.

This method of calculating the kind and frequencies of the second generation hybrids may seem slow and cumbersome. There is a quicker way for those who can recall their elementary problems in algebra. The solution of  $(a+b)^2$  is, of course,  $a^2+2ab+b^2$ . The answer may also be written  $aa+2ab+bb$ . Substitute the dominant gene G (which represents grey) for "a" and the recessive gene g (which represents golden) for the "b" in the algebraic formula and you will see that  $(G+g)^2=GG+2Gg+gg$ .

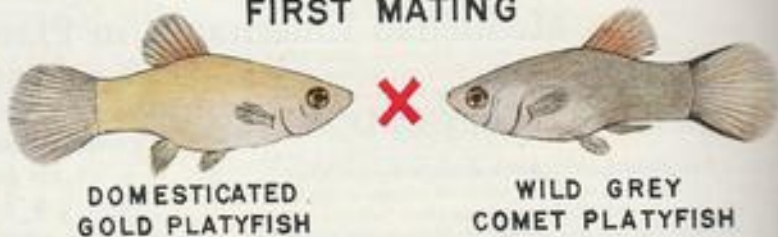
### An Exception to the 3 : 1 Ratio

These calculations indicate the theoretical results expected. I discovered, however, that in actual practice the mating between the golden and grey platyfish rarely produced exactly three greys and one golden in the offspring of the second generation. In most experiments of this kind, I actually found about four or five greys to one golden. This discrepancy was not due entirely to chance, because it happened too often. Further investigation was necessary. At first, I thought perhaps the inheritance of golden was not a simple Mendelian trait, but the data indicated no better conclusion.

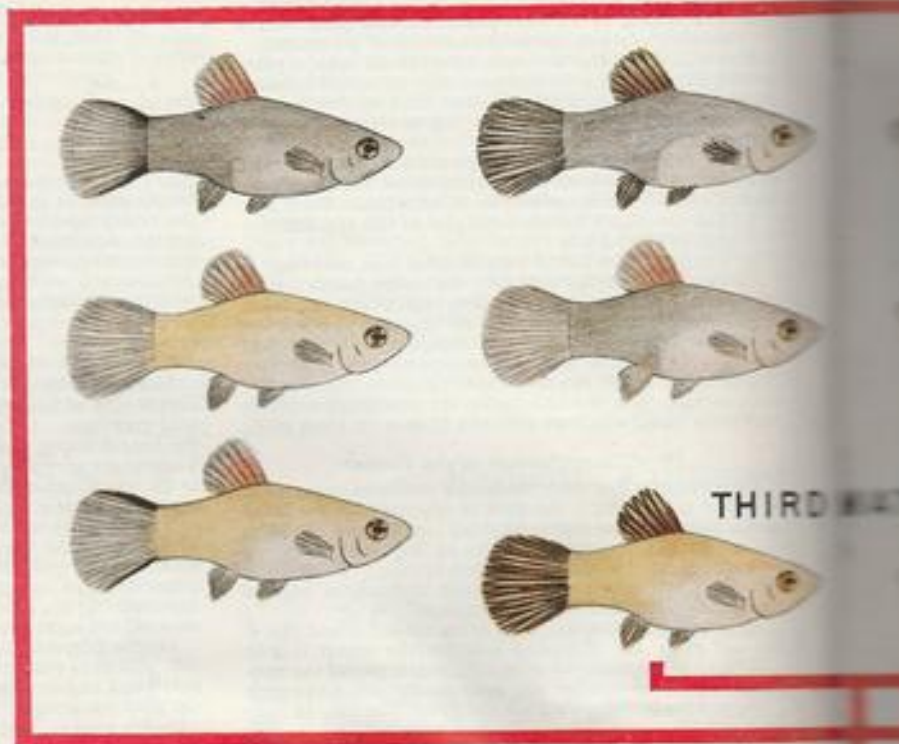
It occurred to me that I was not getting all the golden platys that were produced. For example, and to use round figures, suppose 100 fish were born in the second generation. I expected 75 greys and 25 golden—but what I actually obtained at the time of birth was about 80 greys and 20 golden. Shortly after their births I noticed that many more golden platys died than greys. From this observation I got the idea that perhaps more golden platys were dying before birth.

## ORIGINAL PARENTS

### FIRST MATING



### SECOND GENERATION



### THIRD GENERATION



### GOLDEN WAGTAIL

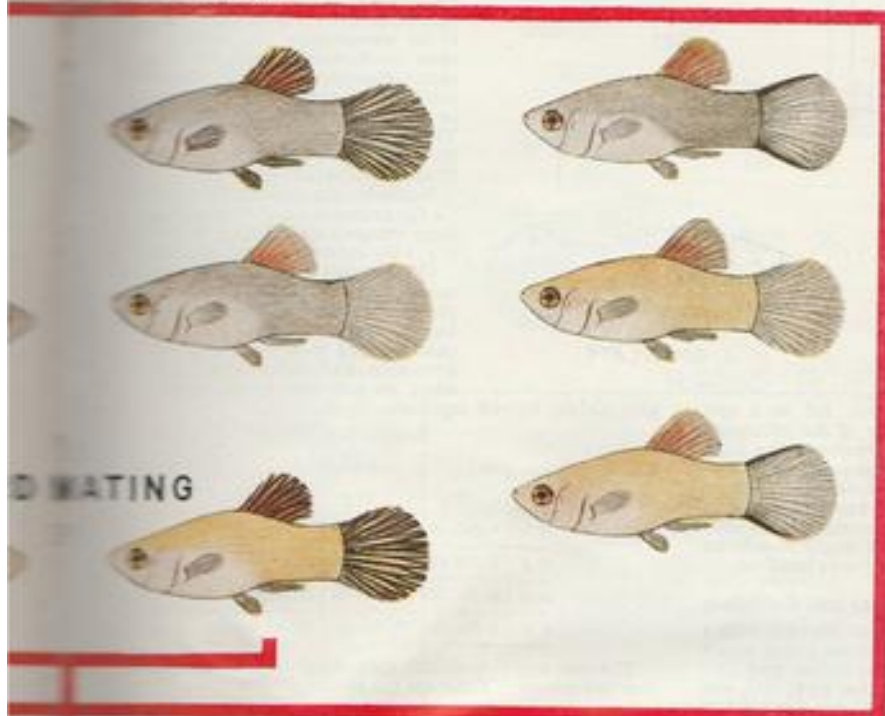


# FIRST GENERATION

## SECOND MATING



GENERATION



GENERATION

PLATYFISH

In order to check my hunch that the slightly abnormal ratio I was getting at the time of birth might be attributed to the differential death rate among the golden and grey embryos, before birth, I ran the following radical experiment:

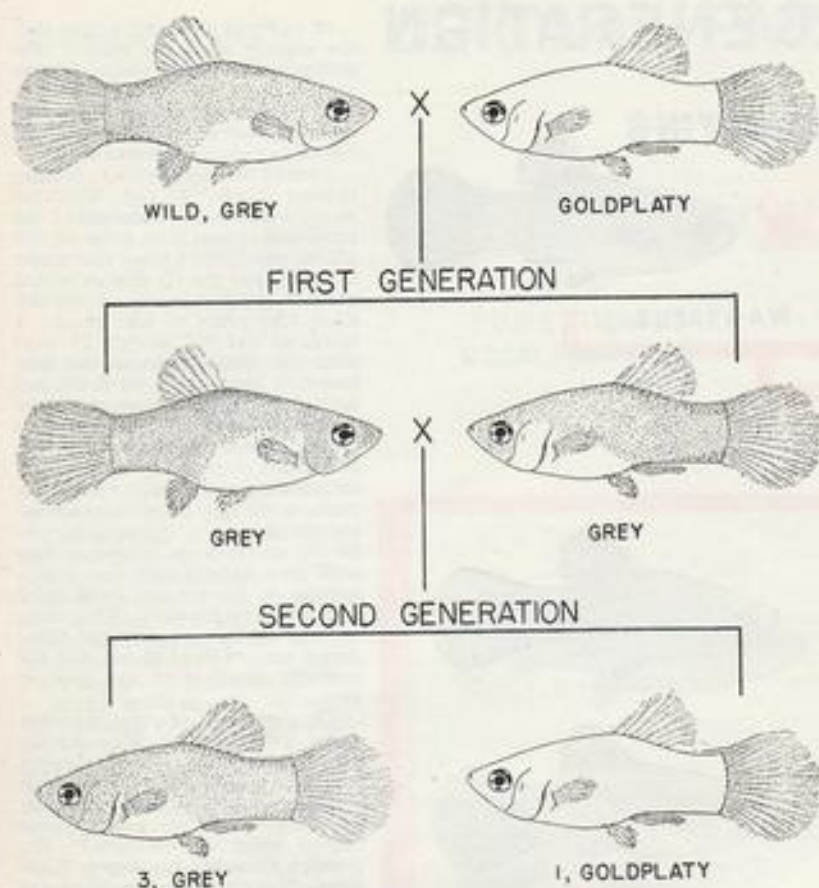
I mated two grey hybrids, brother to sister (that is,  $Gg \times Gg$ ). When the young were born I obtained, as I did previously, about four greys to one golden platyfish. I knew that about a month later the  $Gg$  mother would produce another brood. I did not allow that event to take place. I sacrificed the  $Gg$  mother 25 days after she had produced the first brood. I dissected it, carefully, and from her ovary I removed all the embryos she carried. I counted them. I found that she was carrying just about *three times* as many grey embryos as golden ones. Among the embryos the ratio of three to one was almost perfect. Apparently the golden embryos were weaker than their grey siblings and, as a consequence, at the time of birth there were fewer golden ones. This, then, was the explanation why the Mendelian ratio of three to one was not perfectly matched at the time of birth.

The solution of this problem posed several others. Why did the golden gene in its double recessive state,  $gg$ , kill off some golden embryos? Just what disadvantage or disability did the golden gene impose upon the embryos? Or, perhaps these are the wrong questions. Was the internal environment of the mother's ovary more suitable to the developing grey platys than to the golden? If so, how? All of these questions remain unanswered.

### Mating the Wild Grey Comet and Golden Platyfish

So far I had determined that the comet gene,  $Co$ , was dominant over non-comet  $co$ ; and that grey,  $G$ , was dominant over golden  $g$ . What would happen if the wild comet, which was also grey,  $CoCo GG$ , was mated to the goldplaty which, of course, was also non-comet,  $co co gg$ ? Now we were handling two heritable features together.

I had reason to expect that all of the offspring of the first generation would have the comet pattern and that they would be grey at the same time. I had also expected that the hereditary constitution of the hybrids could be expressed as follows:  $CoCo Gg$ . My expectation was not realised fully because what I got were not comet-grey platyfish but grey wagtails. The grey colouring behaved in inheritance as expected but the comet pattern did not.



## Inheritance of a Single Trait

When a wild grey platyfish is mated to a goldplaty, all their offspring are grey. When the two grey fishes of the first generation are mated brother to sister they produce three grey platys to every one goldplaty. These results indicate that the grey colour pattern is dominant to the golden.

In the mating illustrated, the goldplaty is the male parent and the wild grey platyfish is the female. Other experiments have shown that when the wild grey platyfish is the male parent and the goldplaty is the female parent, the results are identical.

The breeding tests show that the grey pattern is a simple Mendelian dominant character.

(gametes), about half of which carry *O* for one-spotting, the other half carry *o*. At the same time, the same sperm that carries *O* may also be carrying *G* for grey body colouring, or it may be carrying *g* for gold. Thus, on the basis of 100 sperms, 25 of them carry *O G*; 25 carry *O g*; 25 carry *o G* and 25 carry *o g*.

Similarly, the female  $F_1$  hybrid  $Oo Gg$  produces eggs (gametes) that carry the gene combination of *O G*; *O g*; *o G*; *o g*, each in equal numbers.

On this basis we may now proceed to set up the Punnett squares for the purpose of predicting what we might expect to get in the second generation (also referred to as the *second filial* generation and abbreviated to  $F_2$ ) when we mate two  $F_1$  one-spotted, grey ( $Oo Gg$ ) hybrids together.

		Gametes from Male ( $F_1$ )						
		$Oo Gg$						
Gametes from Female ( $F_1$ )		<i>O G</i>	<i>O g</i>	<i>o G</i>	<i>o g</i>			
<i>O G</i>	1.	<i>OO GG</i>	5.	<i>OO Gg</i>	9.	<i>Oo GG</i>	13.	<i>Oo Gg</i>
<i>O g</i>	2.	<i>OO Gg</i>	6.	<i>OO gg</i>	10.	<i>Oo Gg</i>	14.	<i>Oo gg</i>
<i>o G</i>	3.	<i>Oo GG</i>	7.	<i>Oo Gg</i>	11.	<i>oo GG</i>	15.	<i>oo Gg</i>
<i>o g</i>	4.	<i>Oo Gg</i>	8.	<i>Oo gg</i>	12.	<i>oo Gg</i>	16.	<i>oo gg</i>

The next step is to classify the contents of the 16 squares into like groups. These are the results:

I Number	II Types	III Square No.	IV Appearances, Frequencies
1.	<i>OO GG</i>	1	1, <i>O G</i>
2.	<i>Oo GG</i>	3, 9	2, <i>O G</i>
3.	<i>oo GG</i>	11	1, <i>o G</i>
4.	<i>OO Gg</i>	2, 5	2, <i>O G</i>
5.	<i>Oo Gg</i>	4, 7, 10, 13	4, <i>O G</i>
6.	<i>oo Gg</i>	12, 15	2, <i>o G</i>
7.	<i>OO gg</i>	6	1, <i>O g</i>
8.	<i>Oo gg</i>	8, 14	2, <i>O g</i>
9.	<i>oo gg</i>	16	1, <i>o g</i>
Total		16	16

The solution of this unexpected result led to a new discovery and expanded my knowledge of the intricacies of the subject. This is why I, as a geneticist, like most scientists, welcomed the exception to the rule.

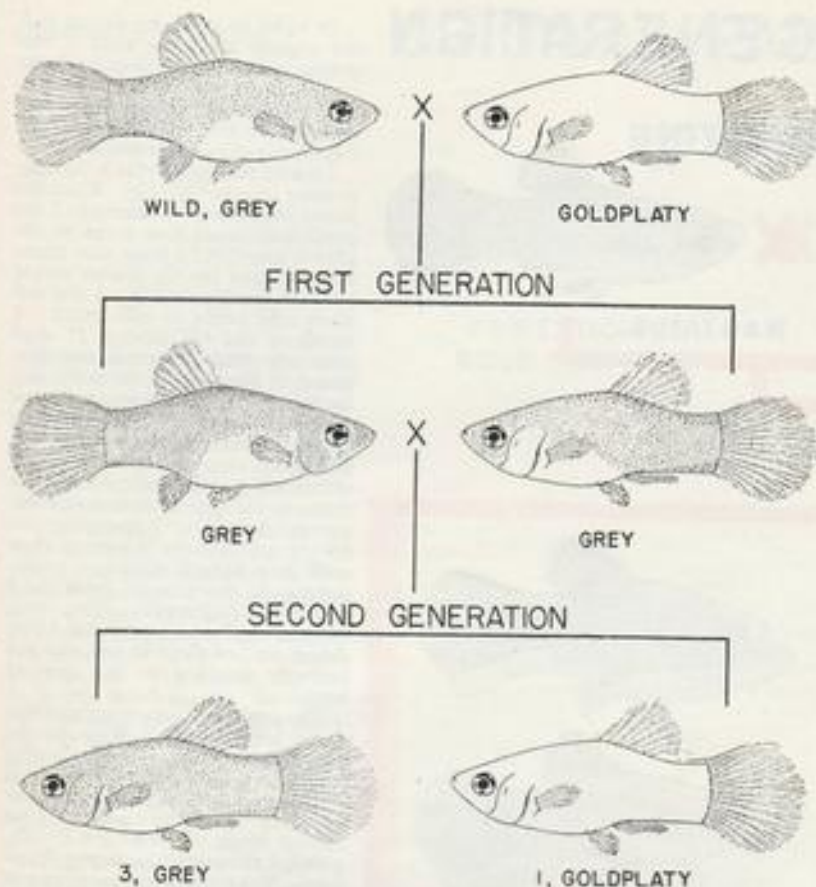
Before going on to explain this exceptional result, I think it would be helpful to describe what I expected to get in terms of somewhat similar mating—a mating which conformed completely with the principles of simple Mendelian inheritance when two inherited characters were involved.

### Mating the Wild Grey One-spot Platy and Goldplaty

When I mated a wild grey one-spotted platyfish with a gold platy I obtained in the first generation young which were identical in coloration and patterning to their grey one-spotted parent. This I took to mean that grey, *GG*, was dominant to golden, *gg* and one-spot, *OO* was dominant to the lack of that particular pattern in the tail region *oo*. The first generation hybrids (also called the *first filial* generation and usually abbreviated to  $F_1$ ) could be defined in Mendelian terms as follows:  $Oo Gg$ .

Now when the grey, one-spotted platyfish  $F_1$  hybrids were inbred, that is, brother to sister, the kinds and the number of the various types could be predicted by utilising the Punnett squares. It must be kept in mind that we are now dealing with two contrasting characters rather than one. Each parent, the father as well as the mother, carries two sets (not one set) of factors *Oo* and *Gg*. The two factors are independent of each other and must be treated separately. The father, for example, produces sperms





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In the mating illustrated, the goldplaty is the male parent and the wild grey platyfish is the female. Other experiments have shown that when the wild grey platyfish is the male parent and the goldplaty is the female parent, the results are identical.

The breeding tests show that the grey pattern is a simple Mendelian dominant character.

(gametes), about half of which carry  $O$  for one-spotting, the other half carry  $o$ . At the same time, the same sperm that carries  $O$  may also be carrying  $G$  for grey body colouring, or it may be carrying  $g$  for gold. Thus, on the basis of 100 sperms, 25 of them carry  $O G$ ; 25 carry  $O g$ ; 25 carry  $o G$  and 25 carry  $o g$ .

Similarly, the female  $F_1$  hybrid  $Oo Gg$  produces eggs (gametes) that carry the gene combination of  $O G$ ,  $O g$ ;  $o G$ ;  $o g$ , each in equal numbers.

On this basis we may now proceed to set up the Punnett squares for the purpose of predicting what we might expect to get in the second generation (also referred to as the *second filial* generation and abbreviated to  $F_2$ ) when we mate two  $F_1$  one-spotted,

The solution of this unexpected result led to a new discovery and expanded my knowledge of the intricacies of the subject. This is why I, as a geneticist, like most scientists, welcomed the exception to the rule.

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grey ( $Oo Gg$ ) hybrids together.

Gametes from Female ( $F_1$ )		Gametes from Male ( $F_1$ )			
		$Oo Gg$			
$Oo Gg$		$OG$	$Og$	$oG$	$og$
$OG$	1. $OO GG$	5. $OO Gg$	9. $Oo GG$	13. $Oo Gg$	
$Og$	2. $OO Gg$	6. $OO gg$	10. $Oo Gg$	14. $Oo gg$	
$oG$	3. $Oo GG$	7. $Oo Gg$	11. $oo GG$	15. $oo Gg$	
$og$	4. $Oo Gg$	8. $Oo gg$	12. $oo Gg$	16. $oo gg$	

The next step is to classify the contents of the 16 squares into like groups. These are the results:

I	II	III	IV
Number	Types	Square No.	Appearances
1.	$OO GG$	1	1, $O G$
2.	$Oo GG$	3, 9	2, $O G$
3.	$oo GG$	11	1, $o G$
4.	$OO Gg$	2, 5	2, $O g$
5.	$Oo Gg$	4, 7, 10, 13	4, $O g$
6.	$oo Gg$	12, 15	2, $o g$
7.	$OO gg$	6	1, $O g$
8.	$Oo gg$	8, 14	2, $O g$
9.	$oo gg$	16	1, $o g$
Total		16	16

The nine types given above in column II are known as *genotypes* because they describe the genetic types or the actual genetic constitution of each individual. The types given in column IV indicate their appearance or *phenotype*. The next step in classification is to add up all the *phenotypes* or those types of like appearance. This is the result:

- 9, *O G* = One-spot, grey
- 3, *O g* = One-spot, golden
- 3, *o G* = Only grey
- 1, *o g* = Only golden

If one were interested merely in predicting the number and kind of phenotypes, this may be accomplished by acting upon the following line of reasoning. One knows that *O* is dominant over *o*. Therefore, in the second generation there will be three *O* to one *o*. Similarly, if *G* is dominant over *g*, in the second generation there will be three *G* to one *g*.

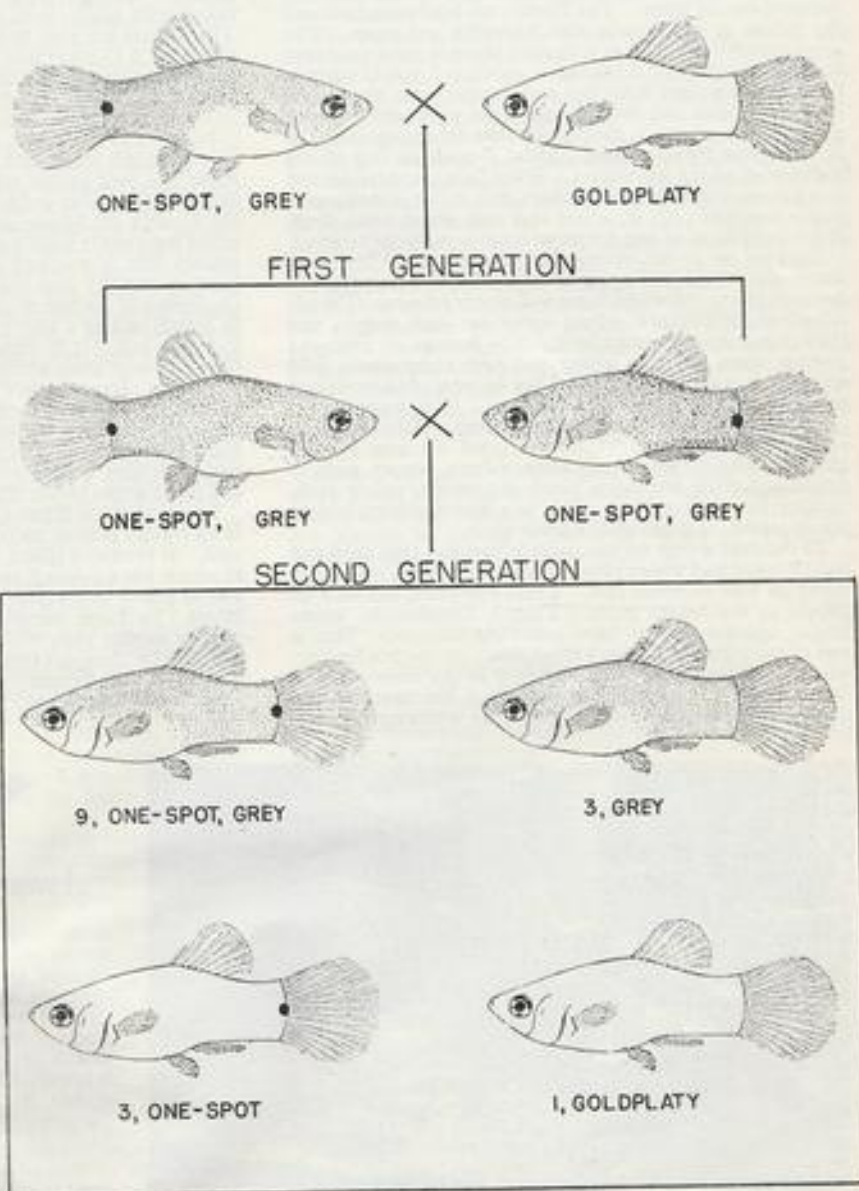
Multiply  $(3 O + 1 o)$  by  $(3 G + 1 g) = 9 OG + 3 Og + 3 oG + 1 og$ .

(In the concluding article of this series next month, Dr. Gordon will detail the genetics of the wagtail platy.)

## Inheritance of Two Independent Traits

When a one-spot, grey platyfish is mated with a goldplaty, all of their offspring are grey and one-spotted. When the one-spot, grey platyfish of the first generation are inbred brother to sister they produce in the second generation the following patterns in the ratios indicated:—9 one spot, grey; 3 grey; 3 one-spot; 1 goldplaty.

If the colour patterns of parents had been reversed from those indicated in the chart, the results would have been identical. The experiments show that the one-spot is dominant over the no-one-spot, and that grey is dominant over golden. The 15:3:3:1 ratio of colour patterns observed in the second generation indicates that the one-spot is inherited independently of the grey. This experiment is an example of inheritance in which two characters are inherited in strict conformity to Mendelian principles.



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## IN THE Water Garden — by Dr. W. E. SHEWELL-COOPER

UP till now we've been studiously leaving out the water lilies and I think this month we must spend some time in considering them. Two friends of mine have just returned from a holiday on the Broads, and one of the things that struck them so much was the water lilies. It certainly is a grand thing to have a late display, and if you spend a September holiday in Norfolk it's surprising what colour there is at the water's edge.

There are, of course, water lilies which prefer to be in six to 12 inches of water and will only cover an area of about 24 inches when they are fully grown. *Nymphaea laydekeri fulgens* is one of them. The flowers are bright crimson and the foliage is olive green with brownish red spots. The scent is very sweet and as it flowers freely is most attractive for small pools. *N. l. lilacea* is another I would include because it is so free flowering and scented; the blooms are medium in size and they change from pink and white to pink and crimson. I should also like to recommend the *N. tetragona pygmaea alba*. This, I think, is one of the daintiest of all the water lilies. It has light green foliage and tiny star-shaped snow white flowers, and, in fact, I have grown it in a receptacle 15 ins. across and only about 9 ins. deep. It has to be seen, as one friend of mine says, to be believed.

To pass on to the plants that prefer, say, 15 inches of water and which will cover an area of about four feet we come on to a number which are well worth growing. There's Albatross for instance, whose leaves are dark purple, and they change to dark green later. The flowers are large and starchy, snow white in colour and have conspicuous gold and yellow anthers. *Ellisiana* I like because of its vermilion red flowers and the orange stamens. The sepals are a contrast, being white, stained with rose. The foliage is olive green. Another which has good contrast is Paul Harriot. The outside petals change from copper pink to bright red while the inside petals are usually yellow pink, turning to red later also. This is a free-flowering variety whose leaves are green with maroon spots.

In the next group we can include varieties that need two feet of water and whose plants, if they grow well, may easily cover an area of seven feet. They, therefore, can only be grown in the bigger pools. There's Escarboucle, whose bright crimson flowers have matching stamens. This is one of the varieties I always think that's on the border line, whereas I have grown it satisfactorily in the former group. James Brydon is a particular pal which has never let me down; it has always flowered gloriously wherever it's been

planted. The flowers are pacony-shaped, being crimson pink in colour with gold stamens. The young leaves start by being purple and then go a glorious green with age. Its only fault is that it needs plenty of room.

Lastly we have the plants which need at least two feet of water, and which, when they are old, cover an area of 10 feet. Of course, they can be kept cut back, but they don't like this. A Colonel A. J. Welch is a bright yellow, star-shaped and very free flowering indeed. I like its foliage for it is quite a change from the other type, being pale green. Attraction is a bright purplish crimson, slightly flaked with white, with stamens a deep mahogany colour. The flowers are very large indeed. A variety that I've had in bloom in October and which is one my friends may have seen on the Broads is Colossea. It's a very pale pink, going white; the flowers are large and the leaves are equally large, being dark green in colour.

Now we've dealt with a number of favourite water lilies we had better come back again to the other aquatic plants. Have you ever grown the fairy moss? This floats on the surface like a moss-green carpet and before dying down in the autumn the foliage goes really brown. I never recommend it for really small pools for I have known it to spread so rapidly that it becomes a nuisance. However, it can be kept at bay by just raking it out occasionally. *Azolla caroliniana* is the one to grow; the fronds are about an inch in length and of a lacy texture. They are first pale green and then red. It is quite a far cry from the *Azolla* to the *Carex*, a sedge grass which will grow at the waters edge or in wet soil. Some people rather jeer at including these grasses, but I rather like one or two of them. For instance, *Carex paludosa*, which has bluish green leaves and brownish black far sides. This is quite decorative. And there's *C. riparia* Bowles' golden which has rich golden yellow foliage and never grows higher than 15 inches.

I only wish the floating water hyacinth were truly handy. It's a regular pest on some of the South American rivers I'm told. It produces spikes of lavender blue flowers, each one of which has a peacock eye. But if you're going to grow it you've got to overwinter the plants in a tank in the greenhouse. Its Latin name is *Eichhornia crassipes*. Lastly we include another plant with a very long name, *Dracopis palmata*, the dragon's head, which bears spikes of rose pink flowers in the summer. It loves shallow water and grows about one foot in height. The foliage is a lovely light green shade.



### Aquarium in the Picture

In this tropical furnished aquarium one plant species (*Myriophyllum*) dominates the scene, but although this plant is grouped mainly to the right the designer has avoided the unnatural effect of symmetry in planting by merging some plants of *Myriophyllum* into the left side of the tank in the *Vallisneria* "group". A tropical lily is planted off-centre to the left and small clumps of hair grass grow in the right foreground. The fishes are tiger barbs.

Photo: Valerie Lilley



# The Chameleon Fish (*Cichlasoma facetum*)

by JACK HEMS

**CICHLASOMA** *facetum*, to give the fish its scientific name, is found in the rivers and streams of south-east Brazil, Paraguay, Uruguay and north-east Argentine. It is one of the big cichlids, and though specimens kept in the average home aquarium with its limited swimming space rarely exceed seven or eight inches in length, wild fish and those kept in 100-gallon tanks in public aquariums grow to a much larger size.

As its common name of chameleon fish suggests, the colours of the fish are very variable. Normally, several dark bars and a horizontal stripe extending between the head and the caudal peduncle adorn the yellow to brown side. But in a moment, this sombre though not unattractive pattern may fade right away and leave just the plain ground colour. During courtship, and other emotional disturbance, the body and fins often become suffused with sooty black. In mature fish, the male may be distinguished from the female by his larger and streamer-like dorsal fin. Both sexes have the dorsal, anal and caudal fins marked with dark streaks and spots.

Young chameleon fish may be kept in a community aquarium populated with active, quick-moving species such as barbs, the sturdier characins and the like. But as soon as the species outgrows its companions, it is advisable to give it a tank to itself; for though it is not such a fighter or bully as the majority of cichlids, it always resents the presence of other fishes in a confined space, especially at mealtimes, or when it feels in the mood to raise a family.

## Chameleon Fish Aquarium

The ideal aquarium for a pair of chameleon fish is one having a thick carpet of sand on the floor and plenty of smooth-surfaced rockwork placed along the back and ends. Like so many other cichlids, the chameleon fish is not fond of plants, except as playthings or very occasional green food. Mention of food leads to the question of its diet. Generally speaking, this should consist of earthworms, minced butcher's offal and similar foods. In short, its food should provide both nourishment and bulk. A few *Daphnia* or a pinch of whiteworms may be ample for a hors d'oeuvres, but not as a main dish.

The chameleon fish is hardy enough to tolerate a wide range of temperature, so long as the change from sub-tropical to tropical conditions is brought about slowly; that is, over a period of several days. During the winter time, 58° to 72° F. is warm enough, but as the days lengthen more heat should be given.

Like many other cichlids, the species spawns on rockwork. Before the strongly adhesive eggs are laid, both fish suck and scrub the favoured surface with their fleshy lips to remove algae and dirt.

After the 100 or so eggs have been deposited, the parent fish take it in turns to watch over them. And while they watch over them they keep a look out for two enemies of the developing ova. One is the rain of fine particles of sediment which they sweep away with fanning movements of their pectoral fins. The other is fungus; this attacks infertile eggs and if allowed to spread would soon attack the healthy eggs.

But as soon as infertile eggs are seen, they are removed from the mass.

Just before the eggs hatch out, the female usually transfers them to another cleaned rock. Sometimes she prefers to carry them to a depression fanned in the sand. Lots of depressions are fanned in the sand between the times the eggs are laid and the fry hatch out. As soon the fry become free-swimming, the parents keep them in a school. When they do swim about, the whole family moves in stately procession with one parent at the head, and the other one bringing up the rear. Stragglers are quickly driven back into the ranks.

The fry are greedy little things with big appetites, and they need plenty of small livefood such as screened *Daphnia*, grindal worms, etc. You can supplement small livefood with scraped raw beef or cooked liver rubbed between the fingers to form a crumbly paste.

It is impossible to lay down a time when the parent fish should be separated from their offspring. It all depends on the individual behaviour of the fish. Some parent fish will keep the family intact for several weeks; others will take no further interest in the fry after they have begun to swim about. Then there are the monsters who suddenly turn cannibals, and make a meal of the fry.

Perhaps the wisest course to adopt is to wait until the fry are feeding and then, one night, after dark, net the parent fish and transfer them to another tank. Some expert aquarists prefer to have it the other way about and net the youngsters. But both young fish and old fish need the same careful treatment; that is, no change in the temperature of the water, and an aquarium filled with matured water to which has been added a pint or two of water from the original tank.

Chameleon fish kept under good conditions will live for many years, and soon become tame enough to accept food from their owner's fingers. In old-time aquarium literature, the species is usually referred to under its erroneous scientific name of *Heros facetus*.

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## Alexandra Park Aquarium, 1874

(Continued from page 162)

case" for twenty-one shillings. No plugging in and cursing worn out diaphragms then!

Always ahead of his time, Saville Kent urged the use of such seaweeds as chlorosperms and rhodospersms, though admitting their temporary success unless kept in continually renewed sea water. "But," urged the seer of 1874, "modern mechanism should cope with the melanospersms (the great ore weeds and wracks) and lead to material increase and acceleration of our present system of circulation. It would go far towards supplying the life-supporting properties of that mighty rush and surge of waters in which alone the laminaria flourish." At least we know enough now not to say "impossible," and the next decade may see Saville Kent's dream come true.

Few good Mancunians to-day can tell you even the site of this vanished aquarium, the wonder house that boasted the finest collection of alligators this side of the Atlantic. As for good Mr. Lloyd's warehouse in Portland Road . . . I have pointed out before, but offer no apology for repetition, how much do we modern aquarists owe to those tight-trousered, top-hatted and slightly unctuous gentlemen of the latter half of last century.



## OUR READERS

### Write—

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.



#### Brown Algae and Glass

FOR the last year I have been troubled with decaying plants and excessive brown algae growth. I have spent pounds on plants only to see them wither and die, especially *Ambulia* and *Cubomba*. I have written to quite a few people and the advice in all cases was "increase amount and duration of top-lighting."

Towards the end I had two 60 watts for 14 hours a day over a 36 ins by 12 ins. aquarium. I also tried completely new compost, a sub-soil and fresh water, all to no avail. I was just about ready to give up trying when I had an accident with my top cover glass and had to replace it. The original glass was "Triplex," the new piece 24 ounce ordinary glass. A few days after this replacement I noticed that my plants were looking better than I had seen them for a long time.

I would be interested to know if any of your readers, perhaps a physicist, could explain the reason for this. Is it possible that the particular part of the spectrum beneficial to plant life is filtered out by "Triplex" glass? I have never seen it mentioned that any old glass does not suffice for a cover glass. It is too early for me to say whether my plants are really taking a turn for the better but I do think there is something in this and would like to read other readers' experiences.

A. WILLIAMS,  
Salford 6, Lancs.

Will someone please perform the crucial experiment of arranging two identical aquaria side by side, one having a glass cover and the other a "Triplex" cover but both illuminated the same to see if there is any marked difference in the growth of plants in each?—Editor.

#### Marine Aquarists' Society

DURING the past few years there has been a considerable increase in the number of marine aquarists. In order that they may compare notes a Marine Aquarists' Society has been formed.

As members will be scattered all over the country the following scheme has been adopted. A note-book will be posted from member to member in which each can enter practical hints, accounts of talks and questions, etc. It should also be possible to exchange specimens which are unobtainable in most places or to send animals to members living inland. Later on it may be possible to form a library and to provide other services, but such facilities as these depend on the numbers and enthusiasm of members.

We would be particularly pleased to hear from any schools that might be interested as we believe that much useful

work is done in schools which would be of great help to other marine aquarists if it were circulated. Anyone interested is invited to write to:—

W. PUGH-THOMAS, Secretary,  
British Marine Aquarists Society,  
23, Waterloo Road, Southport, Lancs.

#### Flowering Aquarium Plants

I HAVE a *Vallisneria spiralis* which is in bloom, with three long stalks and two more starting. The pH of the water is 6.25 and I have a 60 watt lamp over the tank. I have only had my tank two months so I do not know if this is rare or not. I find your magazine most useful and very interesting.

M. S. BARRACLOUGH,  
Ripley, Surrey

#### White Spot Treatment

I AM a beginner at keeping tropical fish and have recently been visited for the first time with white spot disease. There has been rather a surprising sequel to treatment with mercurochrome which I think may be of interest to other readers. It occurred in a well-planted reserve tank with a good growth of algae, no heating above the heat from two 40 watt lighting bulbs and no aeration.

The tank contained two zebra fishes and early in June I introduced two neon tetras. These developed white spot and I decided to try treatment with mercurochrome. From then the diary of events is as follows:—13th July: neons isolated in a jam jar in water well coloured with 2 per cent. mercurochrome solution; 16th July: both neons dead, both zebras were noticed to be infected; 18th July: treated whole aquarium with mercurochrome at five drops to the gallon; 21st July: all spots disappeared, changed half the water.

24th and 27th July: again changed half the water; neither plants nor algae visibly affected, both zebras in fine form; 18th August: two minute fry, about 0.15 in. long, noticed; 24th August: fry seem to have fluorescent line from eyes to caudal fins; 26th August: fry  $\frac{1}{2}$  in. long with pronounced fluorescent eyes and blue line on flanks and developing red at the base of the tail.

It seems that these fry are neon tetras, first appearing one month after the death of the parents in a planted, lighted tank which had been dosed with mercurochrome in the interval. I cannot comment on this except to express my surprise, having read of the special precautions considered necessary to breed neon tetras.

R. S. MILLARD,  
Windsor, Berks.



BOOK  
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**Freshwater Tropical Aquarium Fishes** by G. F. Hervey and Jack Hems. 425 pages; 8 plates in colour; 24 plates half-tone drawings; 87 line drawings in text. Barchworth Press Ltd., 54, Bloomsbury Street, London, W.C.1. 40s. net.

THE happy partnership of authors which produced *The Goldfish* has again successfully operated, this time with *Freshwater Tropical Aquarium Fishes* as the result. In the first part of the book (110 pages) history, aquarium technique, foods, diseases, breeding and showing are covered, and the requirements of the beginner are covered very well. It is the second and major part of the book however, the Catalogue of Freshwater Fishes, which will cause it to be sought after by tropical aquarists and which will build its reputation.

Family by family (36 of them) 500 "tropicals" are catalogued and classified together with documented notes giving the main features the aquarist will want to know about keeping each fish and, where known, about breeding it too. It is a work of reference in which it is a simple matter to find one's way with the three indexes (General, Popular Names, Scientific Names) at the back of the book. The book's illustrations are good; the line figures in the text contain too much detail for the paper on which they are printed to take well, but the colour plates are admirable and so is the general lay-out and typography.

One or two slips have crept into the text: mineral salts quoted are not lost when water is boiled (p. 19); it is doubtful if cataract is the condition cured by the treatments given as satisfactory (p. 74)—true cataract is untouched by externally administered medicaments. These cannot detract from the value of this book and there is nothing to diminish admiration for the industry of Messrs. Hervey and Hems. *Freshwater Tropical Aquarium Fishes* is a work of which both they and British aquarists as a group can feel proud.



The Badge  
for the Aquarist

LAST month saw the debut of the badge for aquarists, when it was displayed on the stand of *The Aquarist* at the B.A.P. at Manchester. 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) and the only lettering on the badge (*Aqua Cuius Visus Agere Nobis*) is borrowed from *The Aquarist's* crest. Recently translated this latin inscription means "Water, the cradle of life, is our field of study." This has, of course, an inspirational appeal, and it is hoped that aquarists all over the world who wear the badge will find that it serves as an immediate introduction to fellow fish-keepers. The angel fish and the stramonian are symbolic of the two main branches of the hobby. 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 xviii, to *Aquarist's* Badge, *The Aquarist*, The Buns, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

The AQUARIST Crossword

Compiled by J. LAUGHLAND



CLUES ACROSS

- "The freshwater shark" (4)
- Rutilus rutilus* (5)
- Make water turbid (4)
- Tiny stream of brill etc. (6)
- These may produce light or water lilies (5)
- Share-out in short (4)
- Hail in the show (2)
- Possessing fins (5)
- Presumably the angler would need to be sharp for this fish (5)
- Sea air in a sense (5)
- Is the gourami voracious? He's inside it! (4)
- And a tunny egg holds Bevan! (5)
- Gleams (anagram) (6)
- Limb of the law or tail from a tropical (1, 1)
- Briefly a cigarette (3)
- King of our rivers (6)
- This *Rubens* is an ornamental as his name (7)
- Ne'er upset is this bird (4)
- Apes from the *Rubens* (4)
- Main fresh (anagram) (9)
- It is the tail-end (2)

CLUES DOWN

- Fish or measure (5)
- Salmon that has just spawned (4)
- Wheel animalcules (8)
- Shout from the hi go! (2)
- Fish lacking natural pigment (6)
- Kingfisher (7)
- Pipe this lad for mixed guppies (3)
- Three quarters bred (3)
- Lesser water violet? (2)
- Very good! (1, 1)
- Fish do this manoeuvre well (4)
- Home of the moor? No, the all blacks (1, 1)
- Salmon river (3)
- Some barbs in common parlance (7)
- Foil age (anagram) (7)
- Wonderful stuff for hose and fishing lines (5)
- Leuciscus leuciscus* (4)
- Nothing (3)
- Parent of parr (2)
- Salmon thus described are best for the table (5)
- Ascending axis of a plant (4)
- Beginning and end of mouth-brooders for madame (3)
- Eft (4)
- Artistic distinction of the *Rubens* (1, 1)

PICK YOUR ANSWER

- The first book on aquarium management was written by a Chinaman in: (a) 1596. (b) 1696. (c) 1796. (d) 1896.
- Aequidactylus jordanii* (the blind characin) is native to: (a) Colombia. (b) Honduras. (c) Mexico. (d) Texas.
- Melanotaenia virgatus* is popularly known in Australia as: (a) the blue gill. (b) The green stripe. (c) The pink ear. (d) The yellow belly.
- Erythraeus swinhonis* (the orange chromide) attains a length of about: (a) 1 1/2 ins. (b) 3 ins. (c) 4 1/2 ins. (d) 6 ins.
- The optimum temperature for *Cryptocoryne* is: (a) 74° F. (b) 77° F. (c) 80° F. (d) 83° F.
- The correct spelling of the generic name of the plant popularly known as the water hyacinth is: (a) *Eichornia*. (b) *Eichoronia*. (c) *Eichhornia*. (d) *Eichhoronia*.

G. F. H.

(Solutions on page 175)



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.

THIRD annual open show of the **Accrington and District Aquarist Society** was held in September, and 6,785 people visited it during the three days it was staged. Over 50 entries of furnished aquaria were displayed and interesting features of the show were the illuminated water garden complete with waterfall and the display of friends and foes of fishes in the aquatic life exhibits on the stand of the Manchester Microscopical Society. The show was included in a B.I.C. programme "Events from the North." From proceeds the society was able to send £86 to the Devon Flood Relief Fund.

LARGEST and most successful show was the verdict on the third annual show of **Banbury and District Aquaria Society** held this year. Lady entrants won the cup for the best fish in the show (Mrs. L. Carpenter), and the shield for the highest points aggregate (Mrs. A. Harris). Best furnished aquarium awards went to Mrs. Harris (senior entry) and Miss J. Wood (junior entry). Best tropical fish belonged to Mr. B. Fargeter and best coldwater fish was that of Mr. D. Thomas. A cup was awarded for the best angel fish in the show (Mr. B. Fargeter).

AS a result of two successful shows held this year and last year, the **Bournemouth Aquarists' Club** now owns 64 aquaria of show size and a good deal of electrical equipment for show use in addition to table show materials. At the annual general meeting of the club all officers were returned unopposed.

POND Life was the subject of Mr. H. J. Wain's talk to members of the **Burton Aquarists' Society** in September. Commencing with the definition of a pond, the lecturer described the plant life to be found both on the banks and in the water, illustrating his remarks with various specimens, including Canadian waterweed, water milfoil, pond weed, starwort, water mint and large flowering willow herb. A specimen of the horse leech was also exhibited and an account given of various crustaceans and insects. Specimens of dragonfly and nymph and of the great diving beetle and its lava were shown to members, and the habits of these carnivores explained. The activities of water boatmen, mayflies, caddis flies and stone flies were described, also the useful work of sewage flies. With regard to gnats and mosquitoes, the lecturer stated that there was absolutely no reason to fear that the garden pool might become a breeding place for these insects; the presence of fish in the pool would be a guarantee that no larvae would survive. The larva of the hover fly, known as the rat-tailed maggot, was described and an account given of the habits of the water spider. Of the 36 varieties of water snails, the lecturer exhibited several specimens from his collection, also fine specimens of the swan mussel as well as a zebra mussel from Barton Pool. The lecturer concluded with an analysis of the food of coarse fish, showing which fish were predominantly vegetarians and remarking that, generally speaking, vegetarians were sluggish, whilst flesh eaters were more active as befitted hunters who had to capture their prey.

A corner of the display of furnished aquaria staged by the **Southall Aquarist Society** at their Exhibition this year.

SEPTEMBER last saw the first public exhibition to be held by the **Croxley Aquarists' Society**, when over 1,000 people attended. Eleven tanks were displayed, 10 of which contained over 250 fishes of various tropical species and the other one was devoted to comet goldfishes, shubunkins and carp.

CHANGE of meeting place is reported from the **Deal and District Aquarist Society**. The society now meets on the third Wednesday of each month, 7.30 p.m. at the Black Bull, High Street, Deal.

ARTICLES in the September issue of the **Bulletin of the Federation of Guppy Breeders' Societies** include details of sending fishes by rail, a report on the Robson guppy and reports from regional groups of the Federation. This year's annual show was held under the auspices of the East Midlands Section in conjunction with the Leicester Aquarist Society's Show.

FURTHER increase in membership has necessitated the **Forest Hill and District Aquaria Society** moving to larger premises at the Railway Signal Hotel, 7, Devonshire Road, Forest Hill, S.E.23. This new venue, just opposite Forest Hill station, provides a comfortable meeting place, centrally situated, with sufficient room for future expansion. Meetings are still held on alternate Fridays and at the first meeting at the new headquarters in September, Mr. R. Billings gave a talk on water plants.

THE annual general meeting of the **Greenwich and District Aquarists' Society** held in September was the society's third one. The member gaining most points throughout the year for tropical fish was Mr. W. Wood, who thus becomes holder of the Covington silver cup. Erith Aquarists' Society members have

held a joint meeting with this society at which aquatic specimens were demonstrated on a screen by means of a microscope projector made by Erith members.

OVER 40 members now belong to the **Haxleden Aquarist Society**, which held its first table show of white cloud mountain minnows (winner Mr. G. Hoyle), and guppies (winner Mr. F. Holden), after an evening talk given by Mr. J. McCormick. Mr. McCormick's subject was a general survey of tropical fish-keeping, in which he dealt with feeding, fish ailments, and water plants and their importance to aquaria.

MR. RUSSELL HOLLAND spoke on home aquaria and catfish breeding when he attended the September evening meeting of the **Ilford and District Aquarists' and Pondkeepers' Society**. A table show of guppies followed, in which the fish entered by Mr. J. Wilson were the winners. An outing to **Southsea Aquarium** was also enjoyed by members during September.

IN the four classes (livebearers, egg-layers, matched pairs and coldwater fishes) of the table show held at a recent meeting of the **King's Lynn Aquarist Society**, there were nearly 40 entries. A marine aquarium and a tropical tank set up by the society in the foyer of St. George's Guildhall during the local Festival Week were examined by H.M. the Queen Mother on her visit there, and Lord Fermoy, president of the society, expressed thanks on behalf of Lady Fermoy for the display. Last month Mr. C. W. Creed visited the society and gave a talk on breeding tropical fishes.

A RECORDING of voices of personalities visiting this year's annual open show of the **Midland Aquarium and Pool Society** was made by Mr. W. Mandeville to be sent to fellow aquarists in America. The attendance at the show was increased over last year's figure by 1,500, and 12 trade stands were presented.

AT the annual general meeting of the **Mitcham and District Aquarists' Club**, chairman Mr. F. West and secretary Mr. S. M. Southey were re-elected. Mrs. W. Biggall is the club's new treasurer. The club's members have had successes at this year's Sutton, Kingston and N.A.S. shows. Meeting nights are now altered to the first and third Thursdays of each month.

RECENT talks given to the **West Surrey Pondkeepers' and Aquarists' Club** were by Mr. McInerney on tropical fishkeeping and breeding, and by Mr. Anthony Evans (*Editor of The Aquarist*) on scientific aspects of aquarium-keeping. Members of the club have made trips to Black Rock, Brighton, and to the **Hastings Educational Museum**, in the past months.



Photo:

Middlesex County Times

THE AQUARIST



## A.S.L.A.S. Show

The Association of South London Aquarist Societies held its first show at the Sutton Adult Education Centre, Bonhill Avenue, Sutton, Surrey, from 19th July to 2nd August. Though restricted to members clubs the maximum entry of 600 tanks was soon reached and everyone worked with a will to make the show a success. The show achieved two important innovations for A.S.L.A.S., namely, all tropicals except guppies were shown in pairs, and the introduction of A.S.L.A.S. trained judges at an Open Show. With regard to the first point, in the livebearer and advanced classes the sexes were separated in glass partitions to avoid any trouble. On the second point, most of the judges had but recently taken the A.S.L.A.S. Judges Course and had only a week then judged club table shows. The Association need never have worried at all, for F.B.A.S. standards, they came through with very little criticism. Here again A.S.L.A.S. introduced another unique idea; the judges recorded their points and their remarks regarding the fish. All these were transferred to printed cards so that when the fish were removed from the tanks every competitor was handed a card with the judges' remarks on every pair of fish entered. Included was an excellent exhibition staged by the London Group of the British Herpetological Society.

## Southall Show

All this year's exhibition of the Southall Aquarist Society were displayed 15 furnished aquaria, plant life exhibits and specimens of live fish. Several thousand visitors from the public attended and at times the crowds were so great the attendance had temporarily to be restricted. Many new members were recruited for the Society as a result of the exhibition.

## Nottingham Show Results

The following are the results of the competitive classes staged at the Nottingham and District Aquarist Society annual show this year:—  
 1. *Polystichus*, male.—1st, Mr. S. Weatherall; 2nd, Mr. W. C. Webley; 3rd, Mr. J. P. Horridge.  
 2. *Pteris*, any variety.—1st, Mr. J. P. Horridge; 2nd, Mr. J. P. Horridge; 3rd, Mr. T. C. Saville.  
 3. *Black mollies*.—1st, Mr. E. C. Preedy; 2nd, Mr. E. C. Preedy; 3rd, Mr. T. C. Saville.  
 4. *Cardinal*, any variety.—1st, Mr. T. C. Saville; 2nd, Mr. T. C. Saville; 3rd, Mr. T. C. Saville.  
 5. *Red mollies and varieg.*—1st, Mr. H. Light; 2nd, Mr. J. P. Horridge.  
 6. *Scarhead and Veiltail male guppies*.—1st, Mr. S. B. Land; 2nd, Mr. R. Hardman; 3rd, Mr. W. Saywell.  
 7. *White cloud mountain minnows*.—1st, Mr. T. C. Saville; 2nd, Mr. E. C. Preedy; 3rd, Mr. E. C. Preedy.  
 8. *Zebrafish*.—1st, Mr. D. J. Lloyd; 2nd, Mr. D. J. Lloyd; 3rd, Mr. D. J. Lloyd.  
 9. *Common goldfish*.—1st, Miss Frances Whaley; 2nd, Mr. W. S. Town; 3rd, Mr. A. E. Adcock.  
 10. *London shubunkins*.—1st, Mr. A. E. Adcock; 2nd, Mr. W. S. Town; 3rd, Mrs. Johnson.  
 11. *Best of shubunkins*.—1st, Mrs. Johnson; 2nd, Mr. A. E. Adcock; 3rd, Mrs. Johnson.  
 12. *A.O.V. coldwater fish*.—1st, Mr. M. Black; 2nd, Mr. H. H. Ede; 3rd, Mr. W. C. Whaley.  
 13. *Junior coldwater furnished aquaria*.—1st, Miss M. Challans; 2nd, Miss V. Christian; 3rd, James Pell.  
 14. *Junior tropical furnished aquaria*.—1st, Miss M. Challans; 2nd, James Pell; 3rd, Miss T. Martin.  
 15. *Senior coldwater furnished aquaria*.—1st, Mr. M. Welch; 2nd, Mr. E. Ballard; 3rd, Mrs. H. P. Lynn.  
 16. *Senior tropical furnished aquaria*.—1st, Mr. D. McCann Pullon; 2nd, Mrs. Welch; 3rd, Mr. F. Mann.  
 17. *Best of coldwater*.—1st, Mr. M.

Welch; 2nd, Mr. A. E. Adcock; 3rd, Mr. W. C. Whaley.

18.—*Breeders' tropical*.—1st, Mr. D. McCann Pullon; 2nd, Mr. J. P. Horridge; 3rd, Mr. D. McCann Pullon.

19. *Furnished vivaria*.—1st, Mr. G. Rose; 2nd, Mr. H. Walker; 3rd, Mr. G. Rose.

**Special awards**.—Junior Shield—Miss M. Challans; Best fish exhibited by a lady—Mrs. Johnson; Best coldwater fish—Mr. M. Welch; Best tropical fish—Mr. T. C. Saville; Best fish in the show—Mr. T. C. Saville; Best reptile—Mr. G. Rose.

## London Breeders' Show

SECOND Annual Breeders' Show of the East London Aquarists and Pondkeepers Association was held last month. A good attendance is reported and there were 72 entries of fishes. All exhibits were judged on individual merits, not in competition with other fishes in the class and according to the judges (Messrs. C. W. Creed, W. P. Bradley, H. S. White and C. R. Looker) the standard of the entries was higher than those entered in the first breeders' show held a year ago. Most outstanding exhibit, which won the Breeding Achievement Cup, was Mr. E. Salt's *Aphyosemion biyatrum*. Best livebearer was a *Mollisima phenos* (Mrs. D. Peary), best labyrinth fish red fighters (Mr. B. Newman). In the coldwater entries fantail goldfishes belonging to Mr. E. A. Petto and Mr. A. G. Duckett won the most outstanding coldwater fish title and the Cousens-Atkinson Trophy for novices fancy goldfish breeding respectively.

## Amphibia Records

EARLIER this year the British Herpetological Society circulated a number of forms for records to be made of spawning dates and other breeding details of British amphibians. The data collected is now being examined and the Society requests that anyone who has not yet returned their form with their observations to kindly send it to the secretary, Mr. J. L. Menzies, c/o Zoological Society of London, Regent's Park, London, N.W.8, as early as possible.

## University Fish Course

ENQUIRIES are invited by the Department of Extra-Mural Studies of the University of London from aquarists who are interested in attending a week-end course of study of fishes, with particular reference to the River Thames to be held at the Maria Grey College, Twickenham, Middlesex, 2nd-4th January, 1953. The provisional fee for the course is £1 2s. Address enquiries to the above department at the University of London, Senate House, London, W.C.1.

## Secretary Changes

CHANGES of secretaries and addresses have been reported from the following societies: **Accrington and District Aquarist Society** (Mr. F. J. Green, 28, Home Street, Accrington, Lancs.); **Bath Aquarist Society** (Miss A. Gurney, 41, Sydney Buildings, Bath); **Bethnal Green Aquatic Society** (Mr. T. F. Duden, 132, Roman Road, Bethnal Green, London, E.2.); **Bristol Aquarists' Society** (Mr. W. E. Ridler, 9, Friendship Road, Bristol, 4.); **Loughborough and District Aquarist Society** (Mr. E. T. Russell, 112, Bottlesacre Lane, Loughborough, Leics.); **Mid-Somerset Aquarist Society** (Mr. P. G. Blackmore, 7, Beechwood, Sunny Bank, Bridgewater, Somerset); **National Aquarists Society** (Mr. L. A. White, 33, Shaftesbury Road, London, N.19); **South London Aquarists** (Mr. J. A. Barber, 4, Court Hope Villas, Wimbledon, S.W.19); **Southport and District Aquarist Society** (Mr. G. F. Briant, 124, Upper Aughton Road, Birkdale, Southport, Lancs.); **Surrey Aquarist Circle** (Mr. A. Brien, 145, Florence Road, Wimbledon, S.W.19).

## New Societies

**Beccles and District Aquarists' Society**: Secretary: R. H. A. Norman, 22, Station Road, Beccles. Meetings: Alternate Mondays.

AFTER the summer recess the **Blair Aquatic Society** is now meeting every Thursday evening, 7.30 p.m., at the Robert Blair School, Blundell Street, London, N.7 (secretary R. Bushnell, 36, Glebe Road, Finchley, London, N.3).

**Boreham Wood and District Aquarists' Society**: Secretary: W. J. Dockree, 39, Alexandra Road, Well End, Nr. Barnet, Herts. Meetings: Every Tuesday evening at Boreham Wood Community Centre.

**Dalton and District Aquarists' Society**: Secretary: A. F. Foxon, 14, Fields Lane, Dalton-in-Purness, Lancs. Meetings: Monthly.

**Hawick and District Aquarist Society**: Secretary: J. J. Kerr, 2, Barl Street, Hawick. Meetings: fortnightly, Thursdays.

**Mid-Devon Aquarist Society**: Secretary: (Mrs.) M. Newton, 12, Jubilee Road, Newton Abbot, Devon.

**Northern Community Association Aquarist Section**: Secretary: E. Almond, 32, Royle Green Road, Northenden, Manchester.

**North Surrey Guppy Breeders Society**: Secretary: J. B. Edwards, 147, Grand Avenue, Surbiton, Surrey.

**St. Leonards-on-Sea Fishkeepers' Society**: Secretary: J. P. Brown, 30, Carisbrook Road, St. Leonards-on-Sea, Sussex. Meetings: Alternate Wednesdays at 15, Gensing Road, St. Leonards-on-Sea.

## Aquarist's Calendar

20th-22nd November: National Exhibition of Cage Birds and Aquaria at Olympia, London.

21st-22nd November: Scottish Aquarium Society 18th Annual Show at the Kelvin Hall, Glasgow.

26th-28th November: Mid-Somerset Aquarist Society Annual Show, held in conjunction with Bridgewater Trades Exhibition at Blake Hall, Bridgewater, Somerset.

28th November: British Herpetological Society Annual General Meeting, 7 p.m. at the Linnaean Society's Rooms, Burlington House, Piccadilly, London, W.1.

29th November: Mid-Devon Aquarist Society, Exhibition of tropical and coldwater aquaria in conjunction with the Newton Abbot Fanciers' Club at Market Buildings, Newton Abbot.

## Crossword Solution

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

PICK YOUR ANSWER (Solution)

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





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### Show Secretary's Message

"Spring Grove,"  
Batley.

21st October, 1952

As Secretary of the British Aquarists' Festival, I had promised to meet representative visiting aquarists at the F.N.A.S. stand. Unfortunately, I fell ill on the Monday and was well on the way to a touch of pneumonia by Wednesday, making it impossible for me to carry out any of my commitments during the last five days. I would like to thank all exhibitors for leaving the Show with their entries, without which, of course, the toil and sweat of those modern slaves, the visiting organisers, would have been in vain.

The judges were faced with a big task and I am happy to acknowledge their masterly handling of the job.

GEORGE W. COOKE

The Challenge Trophies of the British Aquarists Festival were presented to the winners at the F.N.A.S. assembly by Mrs. W. W. Charman, representing the Bentley Press Ltd., publishers of *The Aquarist*.

Mr. Jack Gerber, a well-known personality in the racing world, and owner of that famous 2-y-o filly, Bebe Grande, visited the B.A.F. accompanied by his son. As to be anticipated, he took a keen interest in the breeding classes. Mr. Gerber was impressed by many of the exhibits, particularly the green swordtails. It is believed that there is every likelihood of an addition being made to his "stable."

Water travelling the greatest distance to the B.A.F. was Mr. Stanley McLaughlin. This aquarist from Nairobi has been by "Comet" and planned to take back with him flagtail guppies and several swordtails to add to his collection of over 500 fishes.

Should Mr. C. Graham, Hon. Treasurer of the F.N.A.S., acted as Festival Organiser and did yeoman work to ensure the success of the B.A.F.



## BRITISH AQUARISTS' FESTIVAL

(Organised by the Federation of Northern Aquarium Societies in conjunction with *The Aquarist*)



MANCHESTER — 11th-18th OCTOBER, 1952

### High Standard of Competitive Furnished Aquaria

Record Entries—Breeding Classes increased by over 125 per cent

FOR the second time the large Exhibition Hall at Belle Vue, Manchester, served as venue for Britain's largest annual aquarium show. A smaller area of floor was used this year so that the tropical entries could be housed in one heated section of the Hall, but the total number of entries showed a big increase on last year's figure. Coldwater enthusiasts were not catered for quite so well this year, and tropical classes and entries greatly outnumbered coldwater exhibits. This is, of course, a reflection of the main interest of the societies and individual aquarists participating in the venture.

Setting up and receiving entries had commenced on Thursday, 9th October, when arrivals were speedily dealt with. Arrangements were so far forward that the usual bustle and last-minute rush associated with exhibitions was markedly absent.

Some idea of service accorded to entries for the Show can be gathered from the experiences of members of the East London Aquarists' and Pond-keepers' Association. Although arriving well before dawn they found a warm welcome awaiting them, and their exhibits were very soon safely housed—a pleasant sign of the happy spirit prevailing and the co-operation which existed.

This year's furnished aquaria entries revealed that the previous year's lessons had been well learned as the standard was very much higher, and the long row of attractively decorated tanks

was certainly an exhibit of delight to the public.

The popularity of the Festival is shown by the tremendous increase in the number of entries over last year. In the breeders' classes over 600 fishes were entered in just two classes, and in many instances distance proved to be no object.

The traders, who can always be relied upon to put on a fine display of live-stock and accessories, were again well to the fore with some well-dressed stands, and many aquarists found these an exhibition in themselves.

The Federation of Northern Aquarium Societies can again be proud of this fine contribution to aquatic shows, and it is certain that with the high standard of display that has been set support will always be forthcoming from representatives of all branches of the hobby.



## JUDGING RESULTS AND AWARDS

### Section A.—Furnished Aquaria

Class 1. Club Tropical Aquaria: 1st—East London Aquarists and Pondkeepers Association; 2nd—Blackpool and Fylde Aquatic Society; 3rd—Wharfedale and District.

Class 2. Club Coldwater Aquaria: 1st—Blackpool and Fylde Aquatic Society; 2nd—Blackpool and Fylde Aquatic Society; 3rd—Blackpool and Fylde Aquatic Society.

Class 3. Individual Furnished Aquaria: 1st—K. Tate; 2nd—R. E. Legge; 3rd—A. R. Thorpe.

Class 4. Junior Aquaria: 1st—J. Smith; 2nd—K. P. Huddart; 3rd—N. J. Young.

Best Furnished Aquarium, Section A: East London Aquarists and Pondkeepers Association entry; awarded Customs trophy.

Junior Furnished Aquaria, Section A: J. Smith awarded the Hands trophy.

### Section B.—Coldwater Fishes

Class 5. Common Goldfishes: 1st—J. Scott; 2nd—H. W. Eaden; 3rd—H. P. Horrocks.

Class 6. Shubunkins: 1st—Miss H. R. Gibson; 2nd—J. E. Robinson; 3rd—T. Sims.

Class 7. Fantail Goldfish and Moors: 1st—H. North; 2nd—F. Wardlaw; 3rd—H. W. Pellard.

Class 8. Veiltail and any other variety of fancy Goldfish: 1st—H. North; 2nd—F. Wardlaw.

Class 9. Any other variety of coldwater fish: 1st—E. W. Eaden; 2nd—Messrs. Ryan and Womersley; 3rd—S. Coldbeck.

Best Coldwater Fish, Section B: Oranda (H. North) awarded Belle Vue Ltd. Trophy.

Best Fish in Class 5: J. Scott awarded Leeds and District Aquatic Society Challenge Trophy.

Best Shubunkin: Miss H. R. Gibson awarded Silver Challenge Cup presented by the North-West Section of the Goldfish Society of Great Britain.

### Section C.—Guppies

Class 10. Veiltail (male): 1st—R. Rawlinson.

Class 11. Scartail (male): 1st—A. L. Judge; 2nd—E. W. Eaden; 3rd—A. L. Judge.

Class 12. A.O.V. of Guppy to G.B.S. Standards: 1st—C. Graham; 2nd—C. Graham; 3rd—H. S. White.

Class 13. Female (coloured): 1st—A. L. Judge; 2nd—A. L. Judge; 3rd—W. H. Metcalf.

Class 13A. Female (plain): 1st—H. S. White; 2nd—H. S. White; 3rd—W. J. Horroby.

Most outstanding guppy, Section C: Veiltail male (R. Rawlinson) awarded Guppy Breeders' Society Trophy.

### Section D.—Livebearers (other than guppies)

Class 14. Molly (any variety): 1st—F. Taylor; 2nd—A. Bray; 3rd—F. Holgate.

Class 15. Platy (any variety): 1st—W. Leigh; 2nd—A. J. L. Rashley; 3rd—F. Taylor.

Class 16. Swordtail (any variety): 1st—W. T. Horroby; 2nd—E. Bagnall; 3rd—R. Horrocks.

Class 17. Livebearer (any variety other than above): 1st—Mrs. M. Gilbert; 2nd—A. J. Holloway; 3rd—N. J. Young.

Best Livebearer, Section D: Black molly (F. Taylor) awarded Fraser-Brunner Trophy.

### Section E.—Small Egglayers

Class 18. *Hyphessobrycon* species: 1st—A. J. L. Rashley (*serpa* tetra); 2nd—G. W. Cooke (*rosy* tetra); 3rd—Mrs. M. Hemming (*rosy* tetra).

Class 19. *Hemigrammus* species: 1st—Mrs. M. Hemming (*feather* fin); 2nd—Miss J. Carr (*beacon* fish); 3rd—H. Owen (*beacon* fish).

Class 20. Other characins: 1st—T. F. Whalley (*Meryemus schreineri*); 2nd—Mrs. M. Hemming (*hatchet* fish); 3rd—J. R. Shaw (*black* widows).

Class 21. Other barbs: 1st—Miss M. Clare (*Barbus fasciatus*); 2nd—C. E. Cotton (*spawner* barb); 3rd—J. R. Taylor (*rosy* barb).

Class 22. *Rasbora* species: 1st—Mrs. M. Hemming (*Rasbora maculata*); 2nd—Ryan and Womersley (*harlequin*); 3rd—P. Bentley (*harlequin*).

Class 23. White cloud minnows and any variety zebra fish: 1st—D. C. Crisp; 2nd—G. H. Winder; 3rd—J. Smith.

Class 24. Catfish or loach: 1st—A. N. and K. Rycroft; 2nd—D. and H. Loder; 3rd—F. Bates.

Class 25. Panchax: 1st—J. Woodcock; 2nd—N. A. Brown; 3rd—C. F. Bewick.

Class 26. Glass fish: 1st—T. F. Whalley (*black* banded sunfish); 2nd—D. J. Varnom (*Basil's* kadi); 3rd—Mrs. M. Hemming (*lamp* eyes).

Best fish in the show, Section E: Striped panchax (L. Heason) awarded Daily Dispatch Trophy.

Best Egglayers, Section E: T. F. Whalley awarded *The Aquarist & Pondkeeper* Trophy. East Lancashire Society trophy presented to A. J. L. Rashley for *Hyphessobrycon serpa*.

### Section F.—Labyrinth Fishes

Class 27. Fighting fish: 1st—T. Teale; 2nd—C. B. Bewick; 3rd—A. N. and K. Rycroft.

Class 28. A.O.V.: 1st—A. Morgan; 2nd—G. G. Maycock; 3rd—J. Cuthaw.

Best labyrinth fish, Section F: Dwarf gourami (A. Morgan) awarded Federation of Northern Aquarium Societies Trophy.

Best fighting fish: T. Teale awarded Bland Challenge Trophy.

### Section G.—Cichlids

Class 29. Angel fish: 1st—J. R. Taylor (*Whitwell & Smykala* Trophy winner); 2nd—G. W. Harper; 3rd—G. A. Robinson.

Class 30. A.O.V.: 1st—S. Davies; 2nd—T. Eaves; 3rd—G. H. Phillips.

Best Cichlid fish, Section G: *Cichlasoma auratum* (S. Davies) awarded National Aquarists' Society Trophy.

### Section H.—Breeders' Classes

(teams of six fishes)

Class 31. Livebearers: 1st—F. Taylor (*black* molly); 2nd—R. R. Brough (*swordtail* green); 3rd—R. R. Brough (*swordtail* green).

Class 32. Tropical egg-layers: 1st—F. Bates (*armoured* catfish); 2nd—G. W. Cooke (*glow* light); 3rd—J. R. Taylor (*Serpa*), A. Briggs (*tiger* barbs) and W. Hutchinson (*Basil's* kadi).

Best breeder's effort, Section H: Armoured catfish, bred 14th June, 1952 (F. Bates), awarded the St. Martins Aquaria Trophy.

Best exhibit, Class 31: (R. R. Brough) awarded the Federation of Northern Aquarium Societies Trophy.

Best Exhibit, Class 32: (W. Hutchinson) awarded the Federation of Northern Aquarium Societies Trophy.

### Section I.

Class 33. Rare and unusual species of fish not scheduled in any other class: 1st—J. R. Shaw (*Meryemus rosaceus*); 2nd—Mrs. M. Hemming (*Schismia* catfish); 3rd—J. R. Shaw (*Meryemus schreineri*).

Best exhibit, Class 32: (W. Hutchinson) awarded the Federation of Northern Aquarium Societies Trophy.

### Section J.—Plants

Class 34. 1st—Dr. P. N. Ghadially (*Vallis*, *torta*); 2nd—H. Hemingway (*Vallis*, *torta*); 3rd—G. Mollard (*Vallis*, *torta*).

Best water plant, Section J: *Vallis*, *torta* (Dr. P. N. Ghadially) awarded the *Aquarist & Pondkeeper* Trophy.

### Section J.—Plants

Class 34. 1st—Dr. P. N. Ghadially (*Vallis*, *torta*); 2nd—H. Hemingway (*Vallis*, *torta*); 3rd—G. Mollard (*Vallis*, *torta*).

Best water plant, Section J: *Vallis*, *torta* (Dr. P. N. Ghadially) awarded the *Aquarist & Pondkeeper* Trophy.

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Best water plant, Section J: *Vallis*, *torta* (Dr. P. N. Ghadially) awarded the *Aquarist & Pondkeeper* Trophy.

Best water plant, Section J: *Vallis*, *torta* (Dr. P. N. Ghadially) awarded the *Aquarist & Pondkeeper* Trophy.



(Above) Typical scene at "The Aquarist" stand, on which was constantly visited by veterans and beginners of the Boarder and R. Ashby can be seen busy answering

## CHALLENGE



Above (left to right). Challenge Trophy—Presented by East Lancashire Society (Section E, small egg-layers); Goldfish Society of Great Britain Challenge Trophy; Guppy Breeders' Society Trophy (most outstanding guppy); Bland Challenge Trophy (best fighting fish); F.N.A.S. Challenge Trophy (best exhibit in Class 32); St. Martins Aquaria Challenge Trophy (most outstanding breeder's effort); Leeds and District Aquatic Society Challenge Trophy (best exhibit in Class 5); North-West Section of the Goldfish Society of Great Britain Challenge Cup (best shubunkin); Fraser-Brunner Challenge Cup (best pair of livebearers); National Aquarists' Society Challenge Trophy (for the best cichlid).



### Star Scheme in Operation

The F.B.A.S. new scheme whereby stars of distinctive colours denoting a scale of points values are fixed on award cards by the judges was in operation at the B.A.F. Recipients of the starred awards studied with great interest the displayed notice giving the scale of points values, i.e., gold star, 90 per cent. or over; silver star, 80 to 89 per cent.; cherry star, 70 to 79 per cent.; orange star, 60 to 69 per cent. and below 59 per cent. a black star.





The "Aquarist" stand, on which the B.A.F. trophies were exhibited. The stand veterans and beginners of the "hobby" seeking information, and Mr. A. [unclear] seen busy answering many of the enquiries during a "rush" period.

## CHALLENGE TROPHIES



Age Trophy  
are Society  
Goldfish  
Challenge  
Society  
guppy);  
fighting  
rophy (best  
Martins  
most out-  
leeds and  
Challenge  
); North-  
Society of  
cup (best  
Chal-  
bearers);  
Challenge

Below (left to right), Challenge Cup presented by *The Aquarist* (best exhibit in Section J); Mr. D. Hand's (New Zealand) Trophy (best junior furnished aquarium); *Aquarist's* Challenge Cup (Section E); Messrs. Customs, Sons & Co., Ltd., Challenge Trophy (best furnished aquarium); *Daily Dispatch* Challenge Trophy (best fish of the show); Federation of Northern Aquarium Societies Open Challenge Trophy (best exhibit Section F); Messrs. Whitwell and Strykala Challenge Cup (best pair angel fish); F.N.A.S. Challenge Trophy (Class 31); Messrs. Belle Vue (Manchester) Ltd. Challenge Cup (best exhibit in Section B).



## Biological Exhibit

As neighbour to the stand of *The Aquarist* was the comprehensive biological display made by members of the Manchester Microscopical Society. Attractive wall charts tracing the origin of life in water and the evolution of the fish and higher animals formed a colourful background to this stand. Throughout the show there was an enthusiastic knot of visitors around the microscopes which were put out and through which visitors were given glimpses of microscopic water life under the direction of the Society's helpful members. One container showed a collection of fish lice (*Argulus*), some of the specimens of which were much larger than many aquarists had, perhaps fortunately, ever encountered. This stand was, of course, found particularly interesting by the many parties of school children and their teachers.

## Paragraphs About the Show

Among the many school parties who attended the Show was a small but happy group of deaf and dumb children. Their cheerful demeanour and interest added quite a measure of warmth to the day's events.

There must be something in the Tyneside air when the word cup is mentioned. The Silver Challenge Cup presented by the North-West Section of the Goldfish Society of Great Britain for the best Shubunkin has now followed the Football Association trophy to Newcastle. Miss H. R. Gibson, a member of the Newcastle-on-Tyne Society, was the winner. Well, Newcastle, there are still a further 18 trophies to be won next time!

The Federation of Northern Aquarium Societies are extremely fortunate to have such capable helpers as Mrs. P. D. Hammond and Mrs. H. Hall. A popular feature of which they had charge was a raffle, for which the prizes were three furnished aquaria. Not

many victims escaped these ladies' charming overtures.

The popular award cards presented by *The Aquarist* were again greatly admired, and several enquiries made by clubs who wish to use them for their own shows. The cards, however, have been designed solely for the British Aquarists' Festival.

We understand that despite the enormous entry the losses were extremely light and had the competitors followed stewards' instructions in a couple of instances the fish fatalities would have been negligible.

Many visitors paid a special visit to *The Aquarist* stand for the purpose of taking a photograph of the trophies, which made an attractive display. One of the new additions, the bowl presented by St. Martin's Aquaria, was also much admired.



(Above) Early hours of the morning—and still busy—Mr. E. Chapman, Dr. J. F. Wilkinson and Mr. H. Hall, B.A.F. officials.

(Below) Mrs. H. Hall, Mrs. P. D. Hammond and Mr. Frank Eason at the F.N.A.S. stand which served as an information bureau at the B.A.F.







(Above) The "Quiz" team (the B.A.F. judges) in action, reading from left to right: Messrs. R. G. Mealand, J. Carnell, G. T. Iles (question master), C. W. G. Creed, W. G. Phillips and A. Boarder

## Over 600 Aquarists at F.N.A.S. Assembly

Over 600 aquarists came to the B.A.F. from surrounding towns by train and coach for the Annual Assembly of the F.N.A.S. on Sunday, 12th October. After these Northern Federation members had lunched they gathered in the large concert hall where the cups were presented by Mrs. W. W. Charman, representing the Buckley Press Ltd., publishers of *The Aquarist*. After the presentation a "Brain's Trust" was held with the following participating:—Mr. G. Iles was question master and the team was composed of Messrs. A. Boarder, J. Carnell, C. Creed, R. Mealand and G. Phillips. Mr. Iles had a comprehensive and long list of questions ready for the "Trust" which

was able to deal adequately with them all. Mr. Boarder took most of the cold water queries and the tropical ones were handled well by the other members of the "Trust." The questions were of varied types and included such problems as:—How can one breed *Daphnia*? What is a "Bristol Blue"? How would you start a good strain of fish? How soon should guppies be bred from, how often and for how long? How can white spot be cured? This feature was very well received and it seems more than probable that it will become a permanent attraction for future assemblies. After tea, a film programme was given, the films covering a wide range of interests in the world of zoology.

Distance does not appear to be any object to many of the aquarists who attended the Exhibition as quite a large number were making their second visit. Evidently the B.A.F. is not a case of "once you've seen one you've seen them all."

The keenness with which the schools regarded the Show was evidenced by the Castle Hill School, Bolton. Each student had a similar questionnaire, but

the drawing of a fish at the head of the form was different in each case. Identification of the fish had to be made, and several other questions concerning the country of origin, breeding, feeding and name answered.

We were also pleased to welcome the sons of the late Mr. Cussons (donor of the Cussons Trophy). Although business interests have precluded any time for fishkeeping, they are still extremely

(Below) Members of an audience, numbering several hundreds, deeply absorbed in the questions put to the "Quiz" team and the answers given



interested in the B.A.F. Our readers will remember the picturesque book of coloured plates on tropical fish which was published last year by Messrs. Cussons, Sons and Co., Ltd.

Mr. H. S. White (Chairman of the Guppy Breeders' Society, also made the journey from London, and appeared to enjoy himself thoroughly.

The appearance and design of *The Aquarist's* badges were much appreciated and the limited quantity which were on sale went very quickly. However, fresh supplies are now available, and reference to our editorial pages in this issue will give further details on how to obtain them.

Lastly, for the benefit of the "doubtfuls," Manchester weather was good, and we have come to look upon this "always raining" reference as rather a myth: either that or, in our many visits, we have been extremely fortunate.

### Personalities

Mr. L. Heeson (Huddersfield), winner of the *Daily Dispatch* Trophy for the Best Fish of the Show, started fishkeeping 10 years ago. Readers of *The Aquarist* will recall that Mr. L. Heeson was interviewed and an illustrated article appeared in the August, 1951, issue under the title "Aquarist at Home."

Mr. A. Fraser-Brunner (Advisory Editor, *The Aquarist*) who is in Italian Somaliland, sent a message wishing the B.A.F. every success and regretted it was impossible for him to attend.

Mr. L. R. Brightwell, our contributor of longest standing, was a very welcome visitor to *The Aquarist* stand—he seems to be as humorous and as active as on the day his article appeared in the first issue of *The Aquarist* in 1924.