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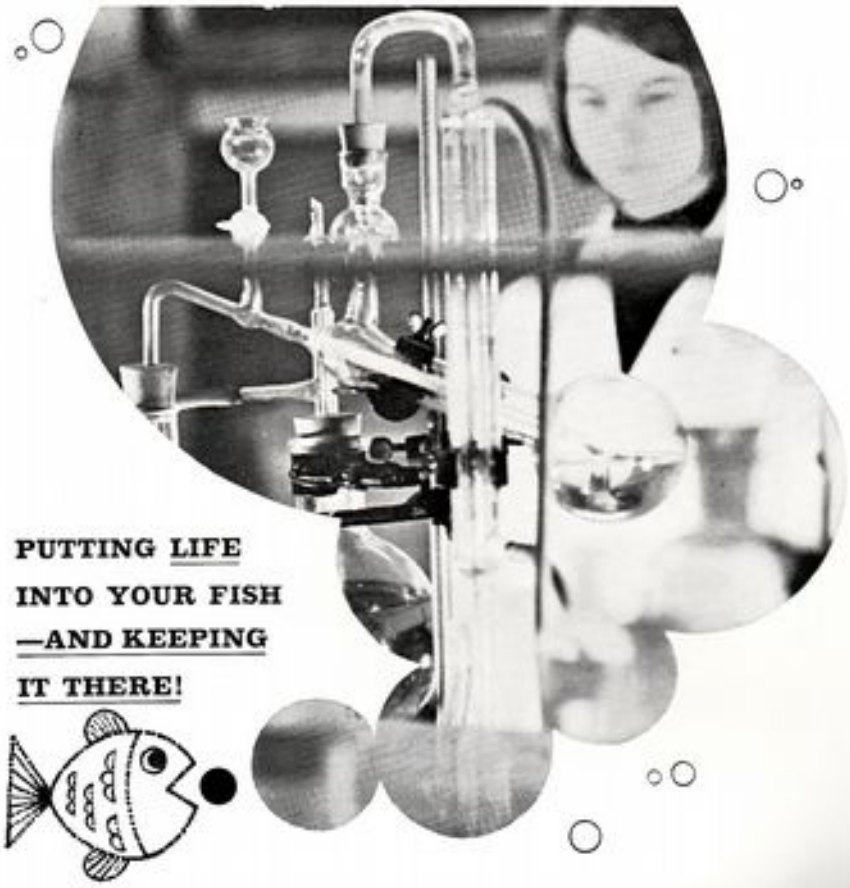

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In This Issue

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Comments and Quotes

New Fisheries Society ● First-time Spawning Haddock ● Floating Plastic Bags ● Avoiding Losses ● Odd Fish Ad.

Fish Scientists Form a Society

ANNOUNCEMENT of the formation of a new society to be entitled The Fisheries Society of the British Isles is welcome news. Dr L. E. Mawdesley-Thomas, acting honorary secretary, writes: 'During recent years it has become increasingly obvious that whilst much study of fish has been undertaken in the British Isles, liaison between the workers from different disciplines has been difficult. In this Society we hope to be able to bring together workers from all disciplines in order to increase our understanding of fish.'

The objects of the Society are to encourage, promote and support all branches of freshwater and marine fishery science, to promote the conservation, development and proper utilisation of fisheries and to hold meetings where information on all phases of fishery research and practice can be presented and discussed. This seems a long overdue development in ichthyological research in this country and one which should receive the wholehearted support of all who are scientifically interested in fishes. With increasing specialisation in the scientific world it is essential that workers in a specific branch should have their own means of communication and of making contact with fellow workers carrying out research work in similar spheres.

By the time this appears in print the inaugural meeting of the Society, addressed by Professor J. M. Dodd of the Department of Zoology, University of Leeds, will have been held at The Zoological Society of London. Anyone interested in the furtherance of the Society's aims is eligible for election to membership. Detailed information about the Society can be obtained from Dr L. E. Mawdesley-Thomas, Fisheries Society of the British Isles, Department of Pathology, Huntingdon Research Centre, Huntingdon.

It is perhaps a far cry from techniques for the single tank in the sitting-room to investigations of the movement of fishes in the North Sea for example, but the wider our knowledge of fishes and the greater the amount of scientific fishkeeping the more the hobby benefits. For this reason PFM endeavours to give regular news of the activities of research workers in our field of interest.

Haddock Spawning in Captivity

FOR the first time the spawning behaviour of haddock has been observed in an aquarium. A. D. Hawkins, K. J. Chapman and D. J. Symonds, scientists at the Marine Laboratory at Torry, Aberdeen, have described in NATURE what happened during April this year with a group of haddock kept in a 700 gallons aquarium supplied with sea water circulated from a large reservoir.

Aggressive displays between male fish were seen and both these and the courtship display of male fish to female fish were accompanied by intense sounds, described as 'a fast knocking sound' and 'a humming sound'. It had been recorded before that the sound-producing muscles of the male haddock are

more highly developed in sexually mature fish. The display of the male, with fins extended, and the sound made appeared to stimulate the female to approach and to follow him. Courtship took place close to the bottom of the tank but release of eggs and milt occurred while the two fish swam vertically upwards with their undersurfaces closely applied together. Sounds made by the male ceased during the sexual embrace.

The eggs, which float in the water, were collected after each spawning and counted. An average of about 12,000 eggs per spawning was recorded with an estimated total production during 14 spawnings over about 21 days of 168,000 eggs. Under the tank conditions it was found that only a fraction of the eggs were fertilised immediately after the embrace, many of the eggs being fertilised later by sperms in the water.

Although it is not known to what extent the behaviour seen in the aquarium is typical of what goes on in the sea, it seems certain that the reproductive behaviour of the haddock is complex and involves close contact between the sexes.

To Float or not to Float?

AN article that first appeared in an American aquarium society journal has been reprinted over here and has given rise to some discussion about the use of plastic bags for tropical fishes. Before the ideas put forward in the article cause too many people to wonder whether they are doing the right thing in floating their bags of fishes in the aquarium for a while before releasing them, we think these 'new findings' should be looked at rather critically.

The article sets out to justify a change in the commonly accepted procedure by saying (1) it is not necessary to float the bags, because 'tropicals may be introduced into warmer water at any time without ill-effect of any kind', (2) fish become distressed and die more quickly in a floated bag than in a bag that is not in contact with water. As far as point (1) goes, it is true that, under most circumstances, in allowing equalisation of temperature the aquarist is playing safe rather than observing an all-important rule, but on the whole we think it is a worthwhile rule to follow. It is point no. (2) that we would challenge most strongly in the light of the article's alleged scientific explanation to back up the recommendation 'never float fish in plastic bags'.

'Bags exposed to the air will "leak" gases very rapidly while floated bags will not as the pores are closed by the outside liquid' says the article. But is there any barrier to the movement (diffusion) of dissolved gases between the bag water housing the fish and the aquarium water in which it is floated?

'Very little oxygen is available even in the best of water' compared with 'common air' says the article. So what? On the whole we think that the existence of fish rather proves that the 'very little' oxygen in water is enough for their needs!

'This vast difference accounts for the rapid oxygen starvation of floated fish' the article says, referring again to the difference between atmospheric oxygen percentage and water oxygen percentage. We do not see how it can account for anything of the kind. It seems that it is the wetness of the outside of the floated bag that worries the author of the article. Why is he not similarly troubled by the wetness of its inner surface?

SHOW dates for next year are already reaching us. Don't forget to obtain your PETFISH MONTHLY *Diary to write up the following in it:*

10th March

HUDDERSFIELD TROPICAL FISH SOCIETY

sixth open show. Friendly & Trades Club, Northumberland St., Huddersfield

13th May

BRIDGEND & D. A.S.

first open show

8th June

LLANTWIT MAJOR A.S.

annual show

Show secretaries are asked to remember to follow up preliminary notifications to us with the addresses of venues, and to let us know time of benching and time of opening to the public as well as the address from which show schedules can be obtained.

Avoiding Losses

THE above-mentioned article's recommendations and theorising were provoked by the occasional happening with which dealers will be familiar: a customer returns dead fish, still in their unopened bag, because he has found them dead on floating the bag before releasing them.

There is not a single explanation for this happening, but the likely circumstances in which the floating of the bag could be responsible is that the top layer of the aquarium water has been, or is being, grossly overheated by top-lighting. Confining fish to this high temperature region can kill. The possibility of death through over-warming at the water surface is much greater if the fish have been confined in the bag's small volume of water for many hours or if the water in the bag was from a slightly polluted tank or one containing chemicals.

Normally the period of equilibration floating required is no more than 10 or 15 minutes. In this time interval, with top lights off and with care taken to check that the top water is not excessively hot, no harm should result. The careful aquarist will always keep an eye on his fish during this time and be prepared to act if signs of distress are seen.

Odd Fish Ad.

'LARGE fish Oscar Severumplecostomus Fiar eel, 14 in., etc.' This advertisement appeared in the classified columns of a non-fishy journal, so we can forgive the amusing result (we are indebted to Mr K. Glover of K.G. Products for sending this one to us). Whilst cocking an eye at the misprints of others, PFM has to confess, to its shame, that it allowed the name of a Danish contributor to be misprinted in the October issue. Apologies, Mr Erik Juhl-Sørensen!

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All About Tropical Fish, by McInerny.	84/–	Freshwater Fishes of the World, by Sterba.	84/–
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LETTERS

Goldfish Standards

ALTHOUGH I am not an aquarium society member and therefore the question of goldfish standards does not concern me very closely, I did read about the agreement reached between the F.B.A.S. and G.S.G.B. (PFM, September) and thought admirable the efforts made by the two organisations to come together. It was something of a puzzler to read the letter from Mr T. L. Dodge in the next issue, for it seems to imply that something horrible has been done to Midlands societies by the agreement. Surely if his organisations were originally agreeable to carry out their judging under F.B.A.S. standards, then now that these standards are withdrawn no harm can be done if the Midlands societies follow the new joint recommendations that have been made. If there is some serious reason why they cannot do this it would have been better if Mr Dodge had said what this reason is. His letter gives no clue to me why it should be necessary for the 'to go our own particular ways' policy to be resumed. Perhaps as an outsider to the world of goldfish showing I am unaware of some important fact he thought too obvious to state, but perhaps also I will not be alone in writing to seek enlightenment.

Woking, Surrey R. JORDAN

WHY do you devote valuable space to these childish controversies about goldfish standards? I keep and breed goldfish and I want to read about the technical aspects of this activity without the distractions of the opinions of people who seem to be happier sitting on committees than keeping fish. If these authorities know so much, let them write about the practical matters that concern us all rather than their petty squabbles.

Chatham, Kent R. WHITE

Cutting Jars

A METHOD of cutting the necks of Winchester glass bottles that I have used does not involve the oily and smelly pyrotechnics described by Mr D. S. Woollenden in his article in the September issue of PFM. I place the jar on its side with its base held firmly against a block and rotate it slowly whilst holding the edge of a triangular file against it. In this way a line can be scored all round the jar at the point that is to be the breakage line. A deep score is made by repeatedly rotating the jar in this way (the line can easily be kept straight if you first mark a line round with ink or a grease pencil). After the score is made I take a poker heated in a gas flame to red heat at the tip and hold it against the score. After one or more contacts (the poker being re-heated if necessary) a loud crack will be heard and the crack can be made to spread evenly round the scored line by fresh application of the poker or by gentle tapping. The top comes off cleanly and I then place the jar upside down on an old piece of plate glass with emery powder and water and rotate it and slide it against the emery until a smooth flat edge is obtained.

Prize Letter

Tolworth, Surrey P. K. LEAR

Wrap those Fish

AT the larger fish shows with traders' stands offering fish for sale it is a common sight to see customers wandering around the show with plastic bags of tropical fish completely unwrapped. Admittedly the halls are so warm that the fish will probably not get chilled while being carted around to see the exhibits, but I wonder what happens when they are taken out of the hall for the journey home?

Also I believe that fish are made very uncomfortable by being suspended in a transparent container with no solid surface beneath them, and for this reason as well I think the plastic bags should be wrapped. If dealers cannot provide bags or papers as they should do, I suppose we aquarists will just have to remember to take our own wrappings for the fish with us.

Manchester P. TUNSWORTH

More letters overpage

"Fancies herself as a line-bred special but between you and me her mother was frightened by a piranha"

Top Lighting

IN the discussion on aquarium covers and overhead lights (PFM, October) no one has mentioned the use of strip lighting. I find this preferable to ordinary bulbs as, although the strip lights are more expensive to buy, they last very much longer and give more even lighting. They do not need a very deep cover to be fitted into and it is quite easy to fix strip-light holders by drilling two holes to take two bolts for each reflector.

Birmingham L. HARDY

I AM interested to know if Mr J. Brent (PFM, October) thinks that if the manufacturers put flanges on their metal covers it would make very much difference. The lights would still be at the back and the water would still run down on to the floor or bench. This is not suitable for a sitting room and makes a mess even on the fish-house floor. This is what I felt before I made my own (as described by Arpee in PFM, September).

I would say that the manufactured metal lid needed many modifications to make it right. My suggestion to Mr Brent is to make one for himself and to try it. It is very cheap to make and if he is at all 'handy' he could do it in about 2 hours. This is the time it takes me. I would not use metal covers now as I think they are useless and not very safe.

Portrush, Co. Antrim G. KNIGHT

Thanks for Support

AFTER 18 exhilarating months as secretary of Warrington Aquarist Society I have now handed over the reins of office to Howard Bennian because of increasing work pressure plus a desire to find more time to spend with fishkeeping and less on administration. May I, through the columns of your magazine, express my sincere thanks to the numerous speakers who have visited our club during my term as secretary and contributed to the rapid increase locally in the hobby and the fantastic growth in attendance at meetings. On every single occasion speakers have attended as arranged and this remarkable record speaks highly for the members of our hobby who use their talents in the form of lectures, slide shows etc.

My thanks are also due to the many people who have written to me about club activities and my apologies wherever I have been unable to reply as comprehensively as necessary due to pressure of work. I look forward to a period as a lively 'back bencher' with the Warrington committee, and hope that my successor will receive as much co-operation and derive as much enjoyment out of his dealings with fellow aquarists inside and outside the society as I have done.

Warrington, Lancs RON TENCH
(ex-secretary Warrington A.S.)

Grisly Gift

MR RIVETT'S letter in last month's magazine (October) about the small angel fish corpse being used to decorate an ornament reminded me of a visit to a public aquarium at a coastal resort three years ago where sea-horse brooches were on sale. These appeared to be dried and varnished baby fish. The proprietor admitted that he had made an error of judgement in stocking them since many of his customers were actively interested in fishes and found the brooches distasteful (whereas in the local chain store similar brooches were selling like 'hot cakes').

It seems to be necessary to 'look after' a living creature, to feed it and to try to provide it with suitable conditions for healthy existence before the human imagination can be fired with enough conviction to prevent the creature in question from being exploited. When large numbers of the population, in the name of sport, spend their leisure time hooking fishes out of their natural element only to throw them back again carrying flesh wounds that make them a prey to fungus and disease, it will be difficult to convince many people of the value of a few small angel fish. Very much slower, but more final results, would be achieved by the spread of the hobby itself so that more and more people keep and learn about fishes. After all, who ever heard of small pickled puppy dogs on sale as ornaments?

Reading, Berks V. PORTH

Guppy Survival

IN your September issue Arpee invited readers to send in 'impossible' stories about fishes, these to be, one assumes, not fictional, however incredible. Anyway, here's mine. Some months ago I removed some guppies from a tank and turned off the light and the air pump. Last week I decided to clean this particular tank out, and on examining the external box filter I was amazed to find it contained a guppy, one of the batch removed nearly 3 months previously!

Though hardly able to swim, the fish was still alive, despite the fact it had received no nourishment for such a long period. I quickly removed it to another tank and fed it on newly hatched shrimp. The fish quickly recovered and seemed none the worse for its experience. We all know about warnings not to overfeed our fish, but this I realise is ridiculous!

London, S.E.20 L. PEARNLEY

Danger from Green Thread

I WOULD like you to point out, for the benefit of other fishkeepers, the danger of using green thread when attaching weights to plants. In my experience, I have found the fishes mistake it for threads of algae and it tangles in their intestines, killing them.

Kenton, Harrow, Middlesex R. BONG

Indian Fern

YOUR pictures of the Indian fern growing above water (PFM, September) interested me because I have a large specimen of this plant that almost fills a 24-inch aquarium. It is completely submerged but the older and lower stems and leaves show the spiky form that the pictures show above water. Have other readers found that old growth in this plant develops this appearance in their tanks?

Glasgow K. B. ANSCOMBE

For the Community Aquarium

A Dozen of the Best

This month a personal selection of twelve tropical fishes suitable for community life and capable of making an attractive display is given to help the newcomer to the hobby in his choice

By R. S. B. PINKS

THERE are few writers who will go so far as to recommend to newcomers to the hobby a collection of fishes suitable for their first tank, and this is hardly surprising when you consider how many possibilities there are—of failure as well as success. It used to be quite fashionable to list possible complements, and the result was something like a recipe for a fish pie: two of this and two of that, usually one catfish and twelve red snails. Livebearers and egglayers were treated as one and the same and little notice was taken of the fact that water does differ in nature from one part of the country to another.

For the average aquarist I think it is preferable to build up a collection bit by bit, rather than to fill his tank in one fell swoop. Nevertheless, there are quite a lot of busy people to whom the thrill of the chase for new specimens is restricted by shortage of time or opportunity, and they will welcome the names of a dozen of the best. The dentist setting up a tank for his waiting room, the hospital friend who wants to provide some cheer for the sick, or the busy executive who wants to add a splash of colour to his lounge, are all faced with difficulties of choice which cannot always be answered at the shop.

The neon tetra is undoubtedly top of my list, and you can bracket with it the cardinal tetra, both of which are fishes of immense popular appeal on account of their bicolour red and and blue-green 'fluorescence'. They live longer than you would think possible; I have several of both which I bought 4 years ago, and they all look good for a long time yet. They seem to retain their youthful look right till the end, and the longer you keep them, the greater will you respect them. No nasty habits and not a bit fussy about food. It is quite true that these

and a number of other tetras require soft acid water to spawn in, but both neons and cardinals manage perfectly well up and down the country in water of the most startling deviation from what is often reckoned to be essential to their well-being.

Third on my list is the glowlight tetra, whose orange-red 'fluorescence', delicately traced on an otherwise glass-like and transparent body, provides graceful and peaceful companionship for the remainder of the collection. It can be a trifle shy in the company of much larger fishes, but comes into great effect when shoaling in a tank shared with just cardinals and neons. It is a ready spawner in the community tank, but do not be misled from this to the belief that its breeding is simple—this is an experience all of its own.

Number four is the X-ray fish or *Pristella*. It is nearly transparent and very silvery. Its feature is a black and white dorsal, very attractive for some contrast. This is an utterly peaceful fish and I have never had any trouble with it whatever. Something of a startling statement, this, but it is nevertheless true. It seems to be rather more disease-resistant than many other fish and is so undemanding that you often fail to notice that it's there! This is not to say that it is not effective in your first tank. It provides movement in mid and upper water, and grows rather larger than the fishes so far mentioned without developing any bullying tendencies.

Fifth is the marbled hatchet. This unusual shape inhabits the upper water, but its chocolate and silver markings and amiable habits make it a popular addition to a small mixed tank. It is said to be rather short-lived, but I wonder just how true this is. Simply because you never see any young hatchet fish for sale, all you buy must be near-adult or adult. The latter obviously die sooner than the others, but this does not mean that the fish is in any way delicate or difficult. Certainly they like a mixed diet, and can only take food from the surface, but just watch them dispose of gnat larvae if you want a few moments of high-speed entertainment.

Half way through my twelve comes the dwarf pencil fish (*Nannostomus marginatus*). It hardly reaches an inch. Black and gold horizontal stripes and red on its fins are exhibited in flashes of brilliance, as this fish incessantly darts from place to place in very straight lines and quivers with suppressed activity when not actually in motion. It is a most attractive and very under-rated little creature, possibly because it is reckoned to be shy in the presence of other larger fishes. This is utter rubbish. Try it and see.

Seventh preference is the garnet or pretty tetra, usually known as *Hemigrammus pulcher* (sometimes the pulcher tetra). Its red eye and glowing rear light of pure gold, together with a black wedge mark towards the rear, give it enough colour to pass it into any collection, but in addition it has a plumpness and greater than usual depth of body in a tetra of its size, which gives it my marks for form. I have never found it difficult to feed, and the normal range of temperatures seems adequate to its needs.

It is said by one authority that it should be kept in the lower eighties to see it at its best. I have not found this to be so, as it seems happy enough from 75°F (24°C) upwards; many fishes will look better if kept above 80°F (27°C), but possibly at some cost to their life span. There is only one thing wrong with the pulcher tetra—its quite unwarranted scarcity. It is a first-class fish in every way and the trade would do well to give it more of a chance, preferably at the expense of some of those very doubtful varieties which sell well but outgrow their surroundings all too quickly.

Eighth on my list is the black widow, which is rightly one of the most popular of all tropical fishes. Its vertical black banding and discoid body shape remind one of the angel, but it has none of the angel's nasty habits in a mixed collection, particularly one of smaller fishes. It is quite distinguished to look at, and its swimming motions support this impression. It never seems to make a false move or to waste effort, which is why I have such regard for it when comparing it with such as the zebra, the tiger barb and the bloodfin, which tire one out with their restlessness when associated with other fishes. It is when you see varieties like these three named in tanks on their own that you realise what 'One Tank Fish' really are! Reverting to the black widow, you will find it attractive when young—it is rather blacker then than when fully grown—and appealing when it is bigger and has shed some of its contrast, because its bigness and unusual shape provide an agreeable foil to the remainder of the collection.

Number nine is the *Otocinclus arnoldi*, or Arnold's dwarf sucking catfish. In truth, I include this very largely because it is an algae-eater which never outgrows its tank, and because the black and white contrast it provides (to say nothing of the flash of gold from time to time) is often quite unexpected, so quickly can this little fish move when it chooses. In good condition it can change position quicker than almost any fish I can think of. 'In good condition' is, perhaps, the quality most difficult to achieve in new-bought specimens, so many of which really look their age. As they seem to hanker after the company of their kind, it is very wise to buy a trio or more if you can afford it. They are said to be a bit susceptible to white spot, so a longish quarantine is recommended.

Tenth is the harlequin rasbora, surely one of the most popular importations ever since the 1930s—it is a pity that their breeding habits are fraught with such difficulty. In good condition the harlequin reaches about 2 inches and glows with a reddish-bronze lustre which sets off its typical black triangle to perfection. It is best seen in a shoal, so if you are able to spare some room for the purpose of shoaling in your collection of small fishes, let the harlequin have a high priority on the list of contenders.

Eleventh on my list is one which got me into mild trouble some time ago with one of our highly respected dealers! I had the temerity to take him to task for not selling the green-eyed rasbora, and he told me bluntly that it didn't sell and never would. I nevertheless hold it in very high esteem, certainly not in ones and twos, but again as a shoal fish. Between six and a dozen in a mixed tank of small fishes is an unbelievably pretty sight. They are well named; their brilliant green eye colour catches the light as they move around the tank in a group made attractive by the slight and slender form of their bodies. They seem not to exceed more than about 1¼ inch, but this size does not make them cowards, for they seem to stand their ground in the same way as the neon. I was, incidentally, delighted to see that the aforementioned dealer had a tank of these fish on display when last I visited his premises, and very much hope that his new-found faith was justified.

I hope that I may be allowed a degree of cheating in selecting the final of my twelve. For this I nominate the serpae tetra, the rosy tetra or the bleeding-heart tetra (I bracket these together because they contribute the splash of red essential in any mixed tank, but I am not sure that you want all three of them in the same collection). I have arranged them in order of size, and you can take your choice. The serpae always seems to me to retain its colour better than the others, but is not as interesting a fish as the others, whose nuptial dances are greatly beautiful and intriguing. The bleeding-heart scores if you wish to balance out the difference in sizes a bit, since it is comparable with the black widow in this respect, and no less peaceable.

This list seems to have become exhausted very quickly, and so it is when you are buying fishes for your first tank; you are close to overcrowding it almost before you have turned the power on. In another article I hope to refer to a number of varieties, which, although superficially popular, take a bit more knowing, and should only be introduced after a bit of thought.

What's New?

Zenith Range

A NEW range of plastic aquarium goods, manufactured under the trade name Zenith, has been made available. Produced in Hong Kong, the range includes a submersible worm feeder (2s 9d) that can be used at any level in the aquarium, a thermometer with sucker attachment that is mounted on a plastic backing that usefully carries both Centigrade and Fahrenheit markings (2s 9d), a fish breeder (3s 6d) made up by slipping a nylon netting rectangle over a plastic frame, and undergravel filters. Size 9½ in. by 7½ in. (8s 6d) and 9½ in. by 5 in. (7s 6d), these undergravel filter plates carry one air stem that can be used at either end of the slotted filter plate. All these items are distributed by Keith Barraclough.

Submersible Power Filter

THE Goliath Submersible Power Filter is a German product that is now being distributed in this country. Made of dark green rigid plastic material, the complete unit is submersed entirely into the aquarium, the 15 watt motor in the upper part being completely waterproof. The turbine by which the water is drawn through the cylindrical filter chamber is lubricated by the water itself. Changing the filter medium is quickly done by sliding the pump unit out of the top of the filter chamber, as shown in the photograph, and there are no screws to be undone. An extension cylinder for the filter chamber is obtainable if it is required to increase the filtration capacity of the appliance. The unit as supplied is designed for tanks up to about 40 gallons capacity. Stated filtration rate is about 45 gallons per hour. Price of the Goliath is £9 10s.

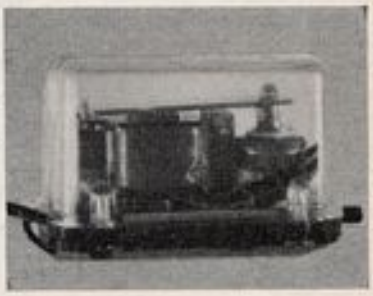
Motor unit and filter cylinder of the Goliath

Silver Remedy

INCLUDED in Inter-Pet's new range of aquarium remedies is **Liquisil,** a soluble preparation of silver that is supplied for sterilising aquarium apparatus and plants (it is a snail-killer) and for treatment of some fish diseases. The **White Spot** remedy developed by the same firm contains a new anti-protozoal agent and with this are buffering chemicals to make the tank water slightly acid so that best conditions for killing the white spot parasites are produced. Price of Liquisil is 4s 6d for a bottle containing 2 fluid ounces; White Spot remedy is 4s 6d for a bottle containing sufficient to treat 30 gallons of water.

See-through Aerator

IF you fancy a vibrator air pump with works that you can watch in operation then have a look at the Uni-Pet **Mariner Pump.** About 4 inches long, 2 inches wide and 2½ inches high, this British pump has a neat and completely transparent plastic case, attached to a base holding the coil etc. by four screws. A plastic loop can be used to suspend the aerator. It is supplied together with a spare diaphragm and is guaranteed for 1 year. Price is 21s.



Aerator with a transparent case—the Mariner Pump

How a Fish Can be Almost Invisible

All Done by Mirrors

By R. McN. ALEXANDER
University College of North Wales

THERE are some fishes which spend most of their time among water weeds, fairly well hidden. The pike is an example. It lurks among weeds, waiting in ambush for its prey. There are other fishes that hide during the day and come out into the open mainly at night. Many catfishes do this in their natural habitat, though the many species of *Corydoras* (the catfish best known to aquarists) are exceptions.

A great many fishes swim around all day in mid-water, with neither weeds nor darkness to hide them. This may endear them to aquarists, for an aquarist likes to get a good view of his fish, but in Nature conspicuousness can be fatal. A conspicuous fish is more likely to be noticed by a predator, and so get eaten. A conspicuous predatory fish is more likely to be noticed by its prey, and its prey is more likely to escape.

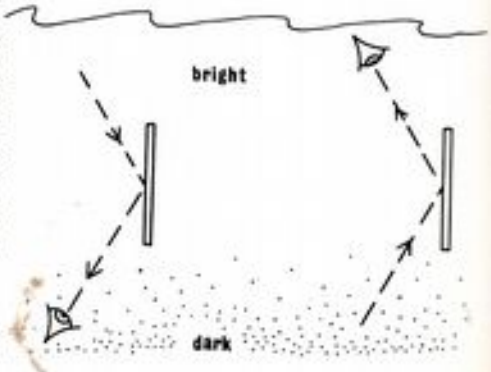
The South American leaf fish avoid the disadvantages of conspicuousness by looking more like leaves than fish. They are flattened from side to side and their oval shape is leaf-like. They are black or brown and blotchy just like the dead leaves which float about in the forest streams where they live. The tail and the fins above and below it would spoil the resemblance to a leaf, were they not colourless and transparent. They are barely visible in the photograph. The leaf fish eat smaller fish, which are unlikely to be much perturbed by the seeming leaf as it drifts towards them. Because it is mistaken for a leaf, a leaf fish can drift right up to its prey and suddenly engulf it in its enormous mouth.

Some other fish avoid being conspicuous by being transparent. The Indian glassfish and the glass catfish have transparent skin and flesh, and are fascinating species to have in the aquarium because you can see the gut inside them. They are much less conspicuous than if they were coloured.

Disguised fish, such as the leaf fish, and transparent fish, such as the glassfish, are exceptional. Far more common are fishes that avoid notice by being silvery. Among freshwater tropicals there are the silver hatchet, the silver *Rasbora*, the silver shark, the tinfoil barb and a host of others whose silveriness is not mentioned in their names. Among British freshwater fishes, the dace, bream, bleak and many others are silvery. Among the fishes you will find at the fishmongers, herring, mackerel and salmon are silvery. Silvery fishes are commoner than fish of any colour. It may be far from obvious that silveriness will make a fish inconspicuous, but it can in the right conditions make a fish almost invisible.

The problem of being inconspicuous in mid-water is this. The light in the sea, or in a lake or river, comes from above. A fish swimming in mid-water may be looked at either from below or from above. If it is looked at from below, it will be seen against a bright background. If it is looked at from above, it will be seen against a dark one. It must blend with both. This sounds impossible, but it isn't. It can be done by mirrors.

Think of a mirror hanging vertically in the sea. Think what it will look like to a fish, or a person, looking at it from a position deeper in the water, as shown at the left of the illustration. The mirror will be seen against a bright background, and the reflection seen in it will be



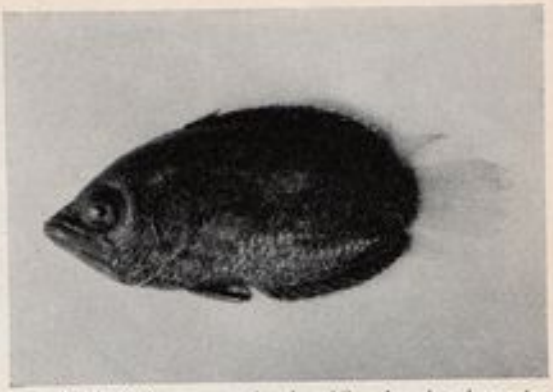
What an observer sees reflected from a vertical mirror underwater when looked at from below (left) and from above (right)

of the bright surface water. It will look bright against the bright background, and so be hard to see. If the mirror is looked at from above, as shown on the right of the illustration, it will be seen against a dark background, and the reflection will be of the dark depths. Once again, it will be hard to see.

The problem is solved. A fish will be inconspicuous if it is covered with vertical mirrors. This is, in effect, the case with silvery fishes. The mirrors are tiny flat crystals of a chemical called guanine. They are too small to be seen except with a microscope. They are arranged, more or less vertically, in the skin and scales of the fish. They work just like the mirror in the diagram, making the fish hard to see from the side, whether from above or from below. However, they do nothing to camouflage the fish when it is looked at from directly above or from directly below. Most silvery fishes, including herring and many tetras, have dark backs which tone with the dark depths, when they are looked at from directly above. They tend to be hard to see from any direction, except from directly below.

Value of Diffuse Light

Silveriness only makes a fish really hard to see in perfect conditions. Think of a fish just below the surface on a bright sunny day. Suppose it is looked at by a fish below it, and to the north. It will be seen against the bright southern part of the sky but the light reflected from its mirrors will come from the duller northern part. It will not quite match its background. Camouflage by silveriness only works really well in diffuse light. It works well in muddy water, or at considerable depths, but not near the surface in clear water. Many of the silvery tetras live in muddy rivers or swamp pools where silveriness is particularly effective. Herring swim near the surface at night but spend the day many fathoms down, where silveriness works well. Silveriness does not make fishes particularly inconspicuous in ordinary aquaria where the water is shallow and not (one hopes) very murky.



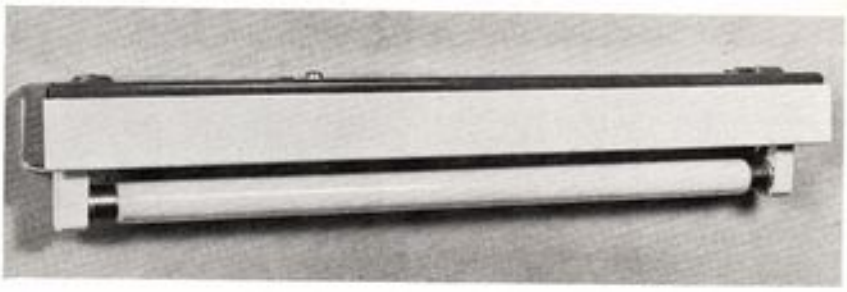
A leaf fish (*Polycentrus schomburgki*). A related species (*Monocirrhus polyacanthus*) is more leaf-like, with a barbel sticking out like a stalk from its chin

However, though it is usually an advantage to be inconspicuous it can also be a disadvantage. Many of the fish that swim by day in open water, swim in shoals. They rely on being able to see each other to keep together. They will be safer if they are inconspicuous to predators, but they must not be invisible to each other. Evolution has dealt with this dilemma in a rather subtle way. Many of the silvery shoaling fishes have one or two dark marks. A great many of the tetras, for instance, have a black spot on the dorsal fin or at the base of the tail, or a line along the body. These seem to serve as secret signs, obvious enough to other members of the shoal which are looking out for them, but likely to be overlooked by an enemy. As well as helping each fish to see the rest of the shoal, they help it to distinguish its own species.

School Pet Fish

WHEN Isaac Walton described the pike as 'the tyrant of the river' he was not counting on 'Fred', the tame pike which is hand-fed by children of Hook primary school, near Basingstoke.

For this pike—said to be the most ferocious of British freshwater fishes—holds no terror for them. Housed in an aquarium in one of the classrooms, it is rapidly outgrowing its home. On a diet of worms dug up by the children, it has almost doubled its size in just over a year. It was caught by schoolteacher Mr Patrick Butler, from the Basingstoke Canal.



What Colour Tube?

By JIM KELLY

EVER since that vital pronouncement in the first chapter of Genesis, verse 14, man has been obsessed with a desire to learn more about light. From the early oil lamps that illuminated the walls of his cave home he has sought brighter and better means of illumination. Unlike bats, photographers and young lovers, we hate the dark, and with the invention of the electric light bulb the world sighed with relief and felt at long last it had conquered—but then it hadn't reckoned with fluorescent or the laser.

The progress to the fluorescent type of lighting added yet one more subject to that long list of suitable material for an aquarium society debate; the voices were raised both for and against it, incandescent v. fluorescent even pushed the perennial 'white spot' into the background! Not wishing to enlarge on the thousands of words written on this topic I merely want to discuss one aspect facing the hobbyist when he decides to plump for fluorescent lighting: 'What colour of tube should I use?' It would seem obvious to the beginner to go for any tube marked 'daylight', 'sunshine' etc., in fact, any tube imitating natural light.

Dr John Ott, a world-famous pioneer of time-lapse photographic techniques, has applied his knowledge of light away from flowers blooming and plants growing to illuminating fish tanks. Let us then see how Dr Ott's experiments line up with the selection of a 'natural' colour.

He used two tanks containing about 50 guppies. Over each he hung two 40 watt fluorescent tubes, four tubes in all, one pair fitted with daylight (giving out a slightly bluish light) and over the other tank cool white tubes (slightly pinkish light). By means of an automatic time mechanism that switched the lights on and off at regular periods he allowed the tubes to remain on for 14 hours in each period of 24 hours.

Breeding and reproduction of the guppies ceased in both tanks. By removing one tube from above each set-up he cut the light down by half and at the same time reduced the time the tubes were switched on gradually over the next few weeks.

Fluorescent units have become smaller and slimmer in recent years, so that they are more readily usable with aquaria. The picture on this page shows an AEI Minipak (21 inch or 12 inch)

The fish under the cool white tube emitting the pinkish light started breeding again and produced young; those under the other remained inactive.

Further experiments showed that of those fry produced under cool white, 80% were females, and the remaining males were abnormally retarded in the development of their secondary sex characteristics.

Meanwhile some research on similar lines was going ahead under the direction of scientists working in the Veterans Administration Hospital in Dallas, Texas. Using guppies again, Doctor Schramm used yellow and blue light sources to light up his tanks, the latter so arranged that the water was circulated between the two ensuring that each tank had similar water conditions.

Those basking in the yellow light produced three broods totalling 37 fry; again females predominated.

The guppies under the blue light never produced any fry and over the following weeks sickened and died. During this time a healthy female was transferred from the healthy yellow light to the blue: result, she sickened and died.

I leave the reader to draw his own conclusions from these findings but feel sure they will help settle some of the perplexing problems they have found when breeding their fish.

Anyway, here's hoping it throws a little light on the subject?

Spatterdocks for the Aquarium

By C. D. ROE

Cape Fear spatterdock (*N. sagittifolium*)

One of the commonest complaints about the growing of aquarium spatterdocks is that rotting of the rhizome occurs. The author describes a method of avoiding this trouble

SPATTERDOCK is the common name given to members of the genus *Nuphar*, which is included in the family Nymphaeaceae, the water lily group.

The common yellow water lily of our rivers, *Nuphar luteum*, is frequently sold for aquaria but very quickly becomes far too large. *Nuphar pumilum*, the least yellow water lily, is a delightful small plant with pale green translucent foliage and bright yellow flowers of about 1 inch diameter and is eminently suitable for both cold and tropical aquaria.

Nuphar sagittifolium, the Cape Fear spatterdock, is just hardy but is better suited to tropical than coldwater aquaria; this plant seldom develops aerial leaves. At present Cape Fear spatterdock is normally supplied by the trade as pieces of rhizome with leaves at one end, often without roots. If newly placed in gravel in an aquarium it commences to grow at the crown and frequently will rot at the other end. Sometimes the rate of rot overtakes the rate of growth.

Once roots have developed at the crown rotting never seems to pass

The least yellow water lily (*N. pumilum*) is a small spatterdock ideal for coldwater and tropical aquaria

the point of rooting. The best way to stimulate rooting and prevent rotting is to encase the rhizome, and particularly the crown, in good loam. If the plant is being introduced to an established tank this loam may be wrapped in tissue around the rhizome and pushed into the gravel. The tissue will satisfactorily contain the soil and the roots will push through this and spread through the aquarium. Like all heavy-rooted plants spatterdocks should not be planted near sub-gravel filters.

Nuphar japonicum is a large and very beautiful spatterdock and small seedlings remain at aquarium size for several years. It has broad arrow-shaped leaves, very attractively waved at the edges. There is a reddish variety described as *Nuphar japonicum* DC var. *rubrotinctum* (Caspary) Ohwi, but this variety is not always in good supply.

SCIENTIFIC NAMES OF FISHES—2

By H. J. VOSPER

Authors' Names and How They are Used

IN the first instalment of this series I discussed the meanings of generic and trivial parts of a scientific name for a fish. The original name of the platy, *Platypoecilus maculatus*, was used as an example to consider, and we can now see how the source of such a scientific name can be indicated and what happens if a change is made.

A scientific name is intended to identify the species under consideration but it does not, in itself, provide any indication of the past history of the species such as movement from genus to genus, nor does it provide any clue leading to the whereabouts of the original description etc. Such names should therefore exhibit the name of the author of the species (i.e. the person who provided the name and description) plus the date of its original publication, whereupon our example becomes:

Platypoecilus maculatus Gunther 1866

The name of the author should, strictly speaking, be written or typed in capitals and set in a type differing from both that of the scientific name and that of the text when appearing in a printed work, but this would seem to be of but little importance and is seldom exactly followed.

In 1913, Dr C. Tate Regan showed that this genus *Platypoecilus* bore a very close anatomical relationship to another, the genus *Xiphophorus*.

In 1932, Dr Myron Gordon collected a strange fish from the River Axila in Mexico which was like both platy and swordtail; in 1951, Dr Gordon and Donn Eric Rosen concluded that the two genera were of such identical form that their differentiation could no longer be supported and proposed that they be included within one group.

Now the genus *Platypoecilus* had been erected in 1866, and was younger than the genus *Xiphophorus* (1848), so by the Law of Priority it became necessary to suppress *Platypoecilus* and to transfer all its species to *Xiphophorus*. The example becomes:

Xiphophorus maculatus (Gunther 1866)

This illustrates the value of the correct use of parentheses (rounded brackets) in association with authors' names, showing movement from genus to genus. In a case of this kind, where the discarded generic name is of long standing and is very well known, it might be considered necessary to indicate the previous name, which is done by retaining it but inserted within square brackets and positioned thus:

Xiphophorus [*Platypoecilus*] *maculatus* (Gunther 1866)

Or here is another way in which it can be treated:

Xiphophorus (= *Platypoecilus*) *maculatus* (Gunther 1866)

If, foe any reason (such as to illustrate a particular point or because the new genus is not yet properly published, settled or known to the writer) only the outdated generic name is to be quoted, then the following method may be adopted:

'*Platypoecilus*' *maculatus* Gunther 1866

When a writer considers that, for purposes of research, his readers might profit from having further clues readily available the name can be written thus:

Xiphophorus [*Platypoecilus*] *maculatus*
(Gunther 1866) Gordon 1951

To be continued

by **ARPEE**

In the June issue of FFM Mr S. Patterson observed that the owners of large aquaria usually asked their dealers for large plants with which to equip their tanks, and suggested that this was possibly because in his experience small plants and cuttings seldom developed well in the wide open spaces of large accommodation. Since he has referred to the matter of 'balance' earlier in his letter I think he has unconsciously answered much of his question, because although balance is a concept understandable enough to most aquarists, its precise creation in any given environment is something very difficult to quantify.

I think that how a living thing will react to any individual environment depends not only on the factors of the surroundings, but on the physical make-up and inherited characteristics of the subject itself. Curious results often occur; I have seen smallish plants inserted into an 18 in. deep tank grow rapidly to the water's surface, but they have been as spindly as matchsticks. Equally, large plants in the same environment have died back and finally taken up a stance at half their former size. I rather think that one way towards success is to plant a tank with a number of groups of medium-sized plants, with a tendency to overplant, rather than otherwise. If fishes are added gradually and other factors remain moderate, the tendency is that a satisfactory relationship will develop between the plants and fishes, but a preponderance of either can, under certain circumstances, be inimical to the other party. I think the precise why's and wherefore's will remain something of a mystery to aquarists, just as do certain similar circumstances baffle gardeners.

An example is the rooting of cuttings. If you put a couple of cuttings in a flower pot they may take ages to take root; one or either may die. If you cram the pot with cuttings, as soon as one begins to throw out roots, so do the others; there is an infectious something in the environment which causes favourable conditions for rooting. So with the aquarium. You may find that above or below a certain concentration of plants things don't seem to go right, and then you hit the balance and hand out the surplus to all your friends. I think, though, that the problems of the aquarist are all the greater than those of the gardener because the number of interacting factors are greater, and whilst the aquarist is concerned with creating a community and sustaining its well-being the gardener is much more often only concerned with part of it and can thereby be more selfish and usually more successful.

Perhaps one of the biggest follies of the pondkeeper is that of buying oversize goldfish and shubunkins for the small pool. These never seem to prosper as do smaller fish, which proceed to grow to what seems to be an optimum size for any given pool under prevailing conditions. The tendencies I have noted here seem to indicate that it is much safer to overstock as regards plant size and quantity than to do likewise with fish. There will always be notable exceptions to either tendency, however, and the moral of all this is that there seem to be few real rules in fishkeeping. In general it may be said that there are only varying degrees of foolhardiness, of which some produce more acceptable disasters than do the others.

The books on aquarium keeping nearly all give very good advice about which fishes suit the beginner, and which are more suited to the old hand, but very few give particularly good advice about plants, excepting those entirely devoted to the subject. I think therefore that the beginner should be warned, particularly about the numerous odd-looking and exotic plants constantly being offered for sale which really require quite different treatment from that the beginner is likely to give them. They are often red or variegated versions of apparently familiar plants, but they seldom bear any name and are sold at considerably higher prices than the commoner and certainly more reliable varieties which have appeared in advertisements for years past.

A particularly frank dealer whom I visited recently dived his hand into a murky-looking tank and pulled out a mass of sorry plant life; he asked me, sorrowfully, whether I had ever tried any of those nasty red plants, whose leaves always came off! I have no doubt that he, too, has learned a rather costly lesson.

The beginner can hardly do better than stick to *Vallisneria*, *Sagittaria* and the *Cryptocoryne*, with Amazon and chain swords to provide variety. With a good light the floating fern also flourishes embarrassingly, and this little collection will provide sufficient variety and 'backbone' to allow the aquarist to experiment from time to time with the chancier plants like ambulia, *Myriophyllum* and *Cabomba*. *Ludwigia* is very unreliable as a submerged plant, and many of the red-leaved plants which resemble it are best left with the retailer, unless you really know what you are about.

A reasonably good way for the beginner to decide whether to buy a plant or not is to see whether it has a root. If it has a root, you have at least half a chance. If it has no root at all, buy your wife a bunch of flowers instead, as this will be in a greatly better cause.

A dealer I was chatting to the other day pointed to some specimen spanner barbs and observed that they had 'just come back that very day'. I rapidly discounted anything to do with reincarnation, in view of their very fine condition, but before I had time to ask him quite what he meant he proceeded to expound the view that more dealers might emulate him and encourage customers to buy fish on the 'lending library' principle. In other words, you buy a pair of fish and return them for their cost value when they have outlived their interest value for you. You can then draw another pair of fish, of equivalent value, on the same terms.

On the face of it, this sounds an absurd arrangement, because it would seem that practically every fish sold

across the counter would find its way back at some time or another, which might involve the retailer in a lot of uncertainty from the point of view of his stocks and his finances. On the other hand, it is not all one-sided. When you buy the initial pair of fish, they are most likely to be young ones; adults would fetch twice the price. You take them away and lavish all the care in the world on them and then discover that you cannot induce them to breed. Back to the dealer they go, and you get another pair of young fish of some other variety to take home with you. Just after you have left, in comes an enthusiast (and there are lots more of them than you would ever believe), who sees a beautifully conditioned pair of just the variety he has been after for the last 6 months. The sale is a ready one, at a fair price. Three people are satisfied by this transaction without anyone being the loser.

There are lots of dealers who would frown at this concept, yet they exchange purchases every day of the week purely for the goodwill. Exchanges are never, however, very popular from the point of view of either the vendor or purchaser because there usually is a residual feeling that someone lost face somewhere in the deal. The beauty of the 'lending library' concept is that the facility is known in advance by both parties, and provided that the local rules are fair and sensible, no malpractices on either side need ever creep in. A considerable long-term benefit is that the customer becomes more and more knowledgeable about fish-keeping, which I think everyone in the trade would acknowledge as being a welcome thing.

Nothing can be more galling to the conscientious dealer who has unsuccessfully tried to deter a beginner from an unwise purchase, than the latter's long face when he returns to complain that the angel ate the neons, but this sort of thing happens up and down the country every week of the year. I wonder what both sides of the hobby think about the notion?

Tailpiece. Since writing October's Tailpiece I have had to enter into quite feverish activity to catch up with the seasonal demands of both the house and the garden. Apart from some modest harvesting there has been a lot of outside work to be attended to, ranging from the preparation of planting sites for autumn-delivered trees and shrubs, to the tidying up of ponds before winter really sets in. This includes protecting the latter from falling leaves.

When the weather turned wet on us I launched into the redecoration of the sitting room, which contains some nine tanks and just a little furniture. I have read some really daunting accounts of precautions necessary before embarking on painting and decorating rooms containing fish tanks, and I had all sorts of qualms. One authority spoke of sealing up the tops of all tanks with Sellotape and leaving them so until every bit of paint odour had disappeared. Another recommended complete evacuation, which at least had the merit of providing some elbow room during the actual operations. I will enlarge elsewhere on all the details, but for those contemplating similar follies it seems to me that these days a lot of modifications may safely be made to the above strict measures without detriment to the well-being of their tanks. I used a lot of Woolworths jelly paint for the walls and ceiling and Crown's new Plus Two polyurethane for the doors and window frames. There were some odd bits of skirting and other woodwork which Duradio black matt undercoat took care of, and the overhead beams were touched up with Darkaline high gloss stain (includes a woodworm killer).

The whole job took a week of evenings and one weekend and there was plenty of opportunity of leaving the windows open in between the showers, as the weather was unseasonably warm. There were no casualities amongst the fishes whatever, despite my having taken no counter-measures. The only evidence of the whole job was something of a scum on the surface of the water, but a newspaper soon removed this. I certainly avoided large build-ups of fumes by doing only one door in an evening and following this with an hour or two of emulsion painting of the walls, which latter was much less odoriferous. I hope that no-one will take it from this that modern paints are completely safe because I am sure that under certain conditions they can prove disastrous.

The next job is to get the tanks back into proper shape. I have two very large angels in an 18 in. tank looking at me quite balefully, and by next month I hope to have them taking some interest in family matters, and also that some glowlights will be coming into condition in one of the spare tanks ready for a December spawning.

Aqua-tip

ALTHOUGH I have spoken to several tropical fish-keepers, I have not found anyone who has tried this method of insulating tanks against loss of heat.

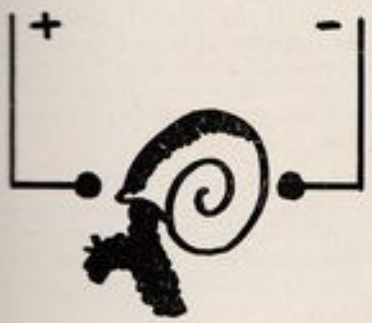
I have insulated my tank in the well-known way with ceiling tiles at back, sides and base but have double-glazed the front by gluing on ½ in.-square wood channelled strip to carry the sheet of glass. I have found that it is possible with the tank at 75°F (and outside temperature 60°F) to turn off the heaters for 6 hours without any loss of heat (this was only done for experimental purposes). On one occasion, by mistake, I turned off the heaters instead of the aerator and it was left for 12 hours, yet the heat loss was only 3°F.

The reason for my experiments with double-glazing is that my fish tank is placed in my garage, where doors often get left open and the temperature falls rapidly. I tried double-glazing on the inside of the tank, but owing to the pressure of the water, this did not prove practical.

Double-glazing on large tanks would pay for itself in a very short time on the saving in electricity, plus the important factor that, during a power cut, or in an emergency such as a blown fuse, there is little heat loss and the method could well save the fish stock.

C. SMALLWOOD

Electrolysis in the Aquarium



By DAVID HOLLAND, M.Sc.

LAST winter I read with interest several letters in PFM on the subject of killing snails by passing a 4½ volt electric current through a tank for a few hours. Recently, goaded into action at last by the continuous destruction of my Indian ferns by a small number of ever-present snails, I decided to give the method a try. At the same time, I sought either to prove or disprove Mr Reid's theory (PFM, February 1967) that the snails are killed by the electrolytic production of copper in the water and not by direct electric shock, as was first suggested.

I set up an electric circuit involving three 1½ volt batteries and two leads each soldered to a penny. At the start of the test I put five snails into a glass tube and covered the open end with some fine mesh gauze. The tube was then put into the tank. After passing the current for 4 hours I remove the pennies and put in a second glass tube containing five snails. Two days later four snails in tube 1 and five in tube 2 were dead. Since the snails in tube 2 were not subjected to the electric current this clearly indicated that death was the result of a toxic substance present in the water.

As a method for killing snails this showed great potential, but there were, however, two side-effects in the experiment which somewhat alarmed me. After the first 2 hours of the electric current, two out of the seven tiger barbs in the tank were in a distressed condition, and were gasping at the surface as though short of oxygen. Naturally enough I moved all the fish to another tank. The other alarming feature was the continuous production from the positive electrode of a grey-blue cloudy substance, which streamed away from the penny on the gentle water current set up by the under-gravel filter. I thought at first that it came from the rubber but I found that the penny itself produced it as well.

Just to confirm the results, I repeated the test and exactly the same things happened except that two snails survived in both tubes. This time I removed only the two distressed fish, as the other five seemed all right.

Being able to use the facilities of a chemistry laboratory I decided to delve further into the various problems posed by these two tests. The first thing I did was to get a sample of water analysed for copper. To my horror, there were 0·17 parts per million (p.p.m.) of copper present in the tank. I say 'to my horror', because the literature on the toxicity of metals quotes 0·10 p.p.m. as being lethal to some species of fishes. Needless to say, I promptly changed the water in the tank.

In the third test I wanted to find out if the dissolved oxygen content of the tank altered in any way during electrolysis. I left the tank with all the fish in it for 24 hours, without the under-gravel filter operating. At the start of the experiment I took a sample of water to test the dissolved oxygen content and another sample to test for copper. The electric current was passed for 3½ hours. I took two further dissolved oxygen samples, one as soon as the two fish appeared distressed and the other at the end. I also sampled for copper at the end.

Analysis of the samples showed no change in the dissolved oxygen content. This led me to suspect that the respiratory distress might be something to do with the bubbles of gas given off by the negative electrode. I later collected some of this gas in the laboratory and found it to be hydrogen. The copper analysis of the other samples showed the concentration to have increased from 0·025 to 0·4 p.p.m. Fortunately I had had the foresight to change the tank water at the end of the test and thus avoided the possible loss of all my fish from copper poisoning. Some of the grey-blue substance produced at the negative electrode was also collected in the laboratory and proved to be a copper salt.

What then are the conclusions one can draw from these experiments?

1. Mr Reid is correct is supposing that the snails are killed by the electrolytic production of copper in the water. I can at this point usefully recap. on his explanation of what happens. The water in a fish tank contains a number of ions in solution, the most predominant of which are hydrogen (H^+), sodium (Na^+), magnesium (Mg^{2+}), calcium (Ca^{2+}) (which Mr Reid omitted), hydroxyl (OH^-), chloride (Cl^-), sulphate (SO_4^{2-}) and carbonate (CO_3^{2-}).

When a low-voltage direct current is passed through the water from one electrode to the other the positive ions are attracted to the cathode (negative electrode) and the negative ions to the anode (positive electrode). All the ions are neutralised at the electrodes and may (a) be liberated as gases, (b) be precipitated as solids, (c) interact with the electrodes, (d) interact with the water.

Hydrogen gas is in fact liberated at the cathode while

the three metals, magnesium, sodium and calcium, return to solution. At the anode the three anions react with the copper in the penny liberating copper ions (Cu^{2+}) into solution. These in turn form the precipitate of mixed copper salts which I had noticed streaming away from the penny.

2. The amount of copper which will pass into solution in the tank is variable and depends on several different factors, in particular the volume of water and the strength and duration of the electric current. Thus the recommended snail-killing dose of 4½ volts for 4 hours will produce different concentrations of copper in different tanks.

3. If anyone intends to use this method for killing snails the important thing to remember is that copper in the water is poisonous not only to snails but to fish also. (I did in fact lose one tiger barb during these experiments and one subsequently). It is vital to change as much of the water in the tank as possible immediately the snails are dead. I found that all the snails died if left long enough exposed to copper. Failure to change the water will not only retard the growth of young fish (as mentioned in one letter) but may even cause actual mortalities.

4. During the course of the experiments I had a theory that the bubbles of hydrogen were interfering with the natural respiration of the barbs. I have just, however, read an alternative and more reasonable explanation for their behaviour. C. van Duijn in DISEASES OF FISHES describes the symptoms of fishes suffering from copper poisoning. He could almost have been watching my fishes as he wrote! He also notes that tiger barbs and half-banded barbs are particularly susceptible to copper poisoning.

So there you have it. If you value any particular fishes in the tank, it is best to remove them during electrolysis and not to return them until the water has been changed. The main conclusion I have reached is that although this method effectively kills snails it has to be used with great care.

Is it New to You?

The Hatchet Barb

Chela mouhoti is a fish of unusual form that is peaceable and hardy

THE common name of 'hatchet' barb gives some indication of the outline of this curious-looking fish. Its deep body has enough of the keel-edge curve in the lower half to give it the authentic 'hatchet' shape, but it is the placing of its short dorsal well to the back, exactly over the anal fin and not far from the caudal, that gives the *Chela mouhoti* its somewhat 'bald' appearance.

Not only is this fish quite new to the aquarium scene but it has been known to ichthyologists only since 1945. Its colour is not particularly conspicuous, being a fairly even silver with a blue sheen. No difficulties with feeding have been found and dried foods are accepted. It swims in the upper part of the aquarium and is said to be a jumper, although our specimens have not demonstrated any particular readiness to do this.

It is not related to the better known 'hatchet fishes' that come from South America, and the place of origin of the hatchet barb is Thailand.

GUPPY World

PETER UNWIN'S Notebook

ONE fish food that seems to have more than its fair share of 'slings and arrows' is the *Tubifex* worm. With the regularity of the seasons one reads in the popular aquatic press about some fishkeeper who has had the misfortune to lose fishes and immediately points the finger at this tiny worm. I, too, in the past have blamed this food but now wonder if I was justified in doing so, and feel this food is often the 'scapegoat' for other factors.

In its mitigation we can commence with the fact that it forms the staple food used by both public aquaria and aquatic traders throughout the world. In 1950, two Czechoslovakian scientists, Dr Varbar Dyk and Dr F. J. Borco, did a series of experiments to determine the types of food suitable for the guppy. *Tubifex* came closest, in their published results, to meeting the needs of this fish. Next came liver, dried lettuce leaves, peas, Bemax, in that order, and right at the bottom of the list (it included many other foods), was the much vaunted white worm. The scientists claimed that the high fat content (5·25%) of the last-named, made them a very unsatisfactory fish food.

In view of reports like that, it makes one feel that before we immediately condemn *Tubifex*, we should at least consider other possibilities? What do you think?

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SURELY the word 'How' didn't derive from some well-trained Hollywood Indian, but from the ranks of the guppy breeders? In an attempt to answer that question, how?, a popular magazine classified the answers to questions asked of top guppy men. The tables produced from these statistics soon make the reader aware that though these learned gentlemen agreed on the wide fields of good diet, healthy breeding stock and correct environment, they differed widely when it came to superficialities.

On the value of changing some of the tank water at regular intervals, most agreed; what they didn't agree about was the amount to change and the frequency. Why change any of the tank water at all?

Guppies void large quantities of urine containing nitrogenous wastes, and this gradually builds up within the tank to a lot of toxic material. And fancy guppies seem very aware of this. In planted tanks the plant roots chemically convert most of the toxic substances produced but, even with these efficient disposal units, some waste remains.

Regular changing of about one-third of the tank water, say every 2 weeks, avoids this build-up, and your guppies will look all the better for the change. You can add fresh water straight from the tap so long as it is brought to the correct temperature. With such volumes any additives in the tap water are so neutralised by the rest of the aquarium contents you won't be troubled by either chlorine or fluoride.

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THE wonderful array of drugs now available to the guppy breeder has cut down considerably the incidence of disease in their tanks. An amusing incident involving the use of a more familiar drug, aspirin, came my way recently. A small boy's pet guppy was looking none too well and he remembered that when Dad had a headache he took some aspirin, so he added a tablet to the tank containing his fish. The fish recovered!

Aspirin consists for the most part of acetylsalicylic acid. Salicylic acid is a good disinfectant and has been used successfully against stubborn cases of gill flukes in fishes. It seems the action of our junior aquarist wasn't such a fluke after all.

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THE guppy is unique in the fish world in that it can differ not only in the many and varied finnage shapes (delta, roundtail, double sword etc.), but also in the extra factors of colour and body patterns. It has been the use of these many facilities that has produced the vast interest in this little fish throughout the world.

Pity that with such a wide field we often hear the remark that some hobbyist has just lost his 'best fish'—best in this case being the largest guppy in his collection. The chase after size has already kicked-back in the United States and Canada, where recent show trends indicate a return to the smaller, more active fish carrying off all the pots.

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EXCEPT perhaps at the larger shows, the containers used by fishkeepers at our many and varied fish exhibitions are anything but standard. The hotch-potch of jars and tanks becomes apparent whether you live in Aberdeen or Plymouth. Great pains are taken in every other field of competitive human endeavour to see that every participant in the show has an equal chance; why do we aquarists have to be so different?

Most agree on the fact that the jars should be square and of clear glass, but that's where most rules end, and the result is a mixture of different coloured caps, tops and even plastic bags fastened round with elastic. As to whether the jar can be painted or contain plants or gravel, the answer to that seems to

rest in most cases with whoever is running the show.

I remember some years back upsetting a very close friend, all because I disqualified his entry. The exhibit in question had 'Holland Toffee' emblazoned all over the jar and still contained prizewinning labels from another show! Isn't it about time all the aquatic bodies took a leaf out of the Guppy Groups Show Book? They have decided rules on the subject, standard to both bodies; they state categorically that the jars should be a certain size, have red caps and may only have the base painted black. No plants or gravel of any kind are allowed within the jar.

PFM recently gave news of agreement between yet two more aquatic groups; please, please, can we have a standard container?

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IF you study the points awarded to the various fish at shows throughout Great Britain, one poignant fact emerges, that judges at the various shows held by the specialist societies tend to point much lower than those at the general open-to-all fish show.

It has been known at these open shows for judges to point the guppy entries as 95, 90, 87 and 85 (these being actual figures taken at random from a club's published results). In the shows staged by the F.G.A. or F.G.B.S., the two guppy societies, for a fish to receive even 90 points would be quite an event. Bear in mind that these shows were judged by their own trained people, not only trained but having had to prove their capabilities through the medium of written, oral and practical examinations.

It is pretty obvious that something is wrong somewhere. Surely the trained personnel are best qualified to judge the particular species in which they have had expert tuition?

This lack of co-ordination means that the owner of a guppy stands as much chance of winning a Best In Show Award at an open show sponsored by a non-guppy society as the same fish of winning the Best Cichlid Trophy! Isn't it about time the various bodies got together and worked out some system whereby specialist judges were employed to cover these classes?

GUPPY STANDARDS INC., the body set up by the **FANCY GUPPY ASSOCIATION** *and the* **FEDERATION OF GUPPY BREEDERS SOCIETIES,** *has been hard at work, and its members, Mr Ken Rigby and Mr Jim Kelly for the F.G.A. and Mr Cole and Mr K. Pearce for the F.G.B.S., have produced a set of workable standards that will be issued shortly as the new Standards Handbook. An open show to which members of both bodies were invited to take part has been staged this month by the Fancy Guppy Association at the Norris Green Boys Club, Liverpool, at which judging took place to the proposed new Standards.*

BILL ARMITAGE'S
Comment

IN the August issue of the JOURNAL OF THE MODERN GUPPY BREEDER (official journal of the F.G.A.) the editor, in passing, mentioned the expense of sending fish to international shows by air freightage. I have no personal experience of showing guppies abroad so I thought it would be interesting to make some enquiries into the matter. I found that, although it is not a negligible item, the cost of sending fish to a show in Berlin, for instance, is not so very much more than the cost of a day out at a similar show in Britain. Of course, the length of the journey plays its part in costing, but it is clearly not a prohibitive expense for guppy breeders to exhibit in the continental shows perhaps much more than we do at present. In this way, much valuable knowledge of show procedures in other countries may be gained and all serve as grist towards making our own International Guppy Show a 'must' for leading continental guppy breeders.

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THERE can be very little doubt that the F.G.A. standard for the colour class was ill-conceived. Several members and also non-members agree with me that it is a class catering for mongrels. The colour class standard as printed in the F.G.A. STANDARDS HANDBOOK reads as follows:

Colour class single fish

Body colour	20
Caudal colour	20
Dorsal colour	20
Body and fins	20
Condition and deportment	20
Total	100

The object of this class is to encourage breeders who may have a colourful strain not yet fixed as to finnage. Entries are pointed without regard to finnage shape or type so long as the fins are regular and without damage.

No matter how carefully one studies this standard one is still left wondering how this class can be an asset to the guppy fancy on the show bench, when the sole object of the class is to encourage breeders to enter any colourful mongrels they may have. Surely a standard should be an ideal, seldom if ever reached. If as in the case of the colour class it is possible to attain somewhere near the ideal without breeding for it, then the whole thing becomes a travesty.

As members of both the F.G.A. and the F.G.B.S. are aware a new set of standards acceptable to both clubs is in the process of being formulated. It is to be hoped that the committee involved will consider either eliminating altogether or, at least, revising this standard to conform with the other standards.

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THE addition of cod-liver oil to the diet of tropical fishes is an important factor. Scientists tell us that the vitamin D of cod-liver oil is a must for the prevention of bone deformities. It is because of the prevalence of deformed spines in guppy fry that most guppy breeders include cod-liver oil in the diet. Nearly all good fish foods contain a specified amount of cod-liver oil, but because of this prevalence of bone deformity in guppies the amount is not always sufficient; therefore it is advisable to add a little more oil. Beginners will find if they heat some dry food in a slow oven and add a few drops of cod-liver oil while the food is still warm the oil will blend perfectly if the food is given a good stir. Food treated in this way should only be fed with once or twice a week.

Well-Supported Show at Nottingham

Left, Nottingham's president Mr C. Hill presenting the prizes with Mr G. H. Goodliffe, chairman

THE FOURTH NATIONAL open show held by **NOTTINGHAM & D. A.S.** attracted some fine fishes among the 400 entries benched this year and resulted in keen rivalry for the best fish in the show award. This finally went to Mr P. S. Moorhouse of Huddersfield for his Gymnotus carapo and he finished the show as the proud possessor of the Nottingham cup, the Syson cup and a special award gold pin. Mr H. Tisbury of Harold Park, Essex was awarded the Brentnall Cup for the best coldwater fish, a calico veiltail. Outstandingly successful among the competitors were Mr and Mrs J. & H. Dernie (Worksop) who completed the show with 15 first awards, five seconds and eight thirds. Mr A. Harper of Stockport was awarded the C. & M. Hill trophy for the best tropical marine furnished aquarium and Mr P. Reynolds of Leeds the Hugh Walker trophy for the best tropical furnished aquarium. Mr D. C. Holland won the Poultry Supplies cup for the best tropical furnished tank 12 in. by 6 in. by 6 in. and Mr W. Taylor of Shaw, Oldham won the Aquarist cup for the breeders egglayers class. The Junior shield for the best entry by a junior went to P. Cox of Nottingham and the special prize of a stainless steel tank for the youngest successful exhibitor was awarded to Miss Alison Hill, granddaughter of society president, Mr Cyril Hill, who presented the awards. If Alison Hill was the youngest successful competitor the eldest perhaps was 94 year-old Mr Bill Saywell of Nottingham who attained two third places. Visitors who supported the show from as far afield as London and Manchester and Leeds participated in another cheerful, highly successful occasion such as has come to be associated with Nottingham. A pleasant venue, well-laid out tanks, interesting and first-class fish, trade stands for added interest and a very fine selection of refreshments, over which the ladies of the society worked extremely hard.

Detailed results were:

Coldwater. Common goldfish: 1, Mr B. W. Forman; 2 and 3, Mr D. Wragg. London shubunkin: 1, Mr J. Amott; 2, Mr B. W. Forman; 3, Mr and Mrs C. Hill. Bristol shubunkin: 1, Mr Beard. Scaled fantail: 1 and 2, Mr H. Tisbury. Calico fantail/veiltail: 1 and 2, Mr H. Tisbury; 3, Mr F. W. Saywell. Black moor: 1, 2 and 3, Mr H. Tisbury. Oranda: 1 and 2, Mr H. Tisbury; 3, Mr and Mrs C. Hill.

Orfe: 1, Mr B. W. Forman; 2, Master Ian Kelly. Rudd: 1, Mr B. W. Forman; 2, Mr and Mrs C. Hill; 3, Mr J. Amott. Tench: 1, Mr and Mrs C. Hill; 2, Mr B. W. Forman. A.o.s. coldwater: 1 and 2, Mr H. Tisbury; 3, Mr and Mrs C. Hill. Breeders coldwater: 1 and 2, Mr B. W. Forman; 3, Mr Monney.

Tropical. *Betta splendens*, male: 1, Mr W. H. Selby; 2, Mrs S. D. Underwood; 3, Mr and Mrs J. and H. Dernie. *Betta splendens*, female: 1, Mr and Mrs J. and H. Dernie; 2, Mrs S. D. Underwood. Thick-lipped gourami: 1, Mr Morrell; 2 and 3, Mr E. N. Gee. Dwarf gourami: 1, Mr and Mrs J. and H. Dernie; 2 and 3, Mrs C. M. Beard. Lace gourami: 1, Mr G. Wanless; 2, Mr D. Wragg; 3, Mr and Mrs J. and H. Dernie. Blue gourami: 1 and 3, Mrs S. D. Underwood; 2, Miss A. Hill. Gourami, a.o.s.: 1 and 3, Mr and Mrs J. and H. Dernie; 2, Mr W. Parkin. A.o.s. anabantid: 1, Mr Morrell; 2, Mr G. Hodgkinson; 3, Mr F. Underwood.

Rosy barb: 1, Mr F. Underwood. Cummingi barb: 1, Mr J. Allen; 2, Mr G. H. Colton; 3, Mr A. Saxton. Nigger barb: 1, Mrs J. K. Smith; 2 and 3, Mr F. Saunders. Chequer barb: 1, Mr G. Balleyment; 2, Mr W. Taylor; 3, Mr and Mrs J. and H. Dernie. Tiger barb: 1, Mr and Mrs J. and H. Dernie; 2, Mr G. Hodgkinson; 3, Mr and Mrs J. and H. Dernie. Cherry barb: 1, Mr and Mrs J. and H. Dernie; 2, Mr Trevor Poizer; 3, Mr A. Beasley. Barbs, under 3 in.: 1, Mrs J. K. Smith; 2 and 3, Mr G. H. Colton. Barbs, over 3 in.: Mr W. Parkin; 2, Mr and Mrs J. and H. Dernie; 3, Mr G. Wanless.

Red-tail shark: 1, Mr J. Warren; 2, Mr E. N. Gee; 3, Mr D. Halford. Black shark: 1, Mr T. R. Gould. Silver shark: 1, Mr W. Parkin; 2, Mr E. N. Gee.

Flames: 1, Mr and Mrs J. and H. Dernie; 2, Miss A. Hill; 3, Mr A. Mawson. Glowlights: 1, Mr S. Hill; 2, Paul Hodgkinson; 3, Mr and Mrs J. and H. Dernie. Neons: 1, Mr T. Poizer; 2, Mr F. Underwood; 3, Mr D. Wragg. Rosy tetra: 1, Mr and Mrs J. and H. Dernie; 2, Mr A. Mawson; 3, Miss A. Hill. Bleeding-heart tetra: 1, Mr and Mrs J. and H. Dernie; 2, Mr G. Wanless; 3, Mr J. Warren. Serpae tetras: 1, Mr and Mrs C. Hill; 2, Paul Hodgkinson; 3, Mr A. Mawson. Cardinal tetras: 1, Master P. Strange; 2, Mr F. Underwood.

Beacons, etc.: 1, Miss A. Hill. Black widows: 1 and 3, Mr B. C. Deanes; 2, Mr K. Binns. Penguins: 1, Mr T. Poizer; 2, Mr and Mrs J. and H. Dernie; 3, Paul Hodgkinson. X-ray tetras: 1, Master P. Cox; 2, Mr and Mrs C. Hill. Golden pencils: 1, Mr G. H. Colton; 2, Mr S. Hill; 3, Mr P. Reynolds. Dwarf pencils: 1, Mr S. Hill. A.o.s. characins: 1, Mr W. Parkin; 2, Mr P. Reynolds; 3, Mr E. R. S. Stockdale. Striped anostomus: 1, Mr W. Parkin.

Swordtails, males: 1, Mr I. H. Hunt; 2, Paul Hodgkinson; 3, Mr W. Parkin. Swordtails, females: 1 and 2, Master D. Beard; 3, Mr Gerald Boothby. Platy, male: 1, Mr and Mrs J. and H. Dernie; 2, Mr J. Allen. Platy, female: 1, Mr and Mrs J. and H. Dernie; 2, Mr S. J. Underwood; 3, Mr and Mrs J. and H. Dernie. Mollies, male: 1, Mr and Mrs J. and H. Dernie; 2, Mr G. Wanless; 3, Mr E. N. Gee. Mollies, female: 1, Mr and Mrs J. and H. Dernie, 2, Mr A. Beasley; 3, Mr W. Parkin. Guppy, male: 1 and 2, Mr A. Mawson; 3, Mr W. Parkin. Guppy, female: 1, Mr W. Parkin; 2, Mr F. Underwood; 3, Mr G. Boothby. A.o.s. livebearer: 1, Mr and Mrs J. and H. Dernie, 2 and 3, Mr P. Reynolds.

White clouds: 1, Mr F. Underwood; 2, Mr E. R. S. Stockdale; 3, Mr P. Reynolds. Harlequins: 1, Mrs J. K. Smith; 2, Mr J. G. Hunt; 3, Mrs J. K. Smith. Scissortails: 1, Mr F. Gregory; 2, Mr G. Boothby; 3, Mr and Mrs J. and H. Dernie. A.o.s. Rasboras: 1, Mr G. Hodgkinson; 2, Mr G. Reddish; 3, Mr J. Allen. *A*

Continued overpage

Winner of best fish in the show awards, Mr P. S. Moorhouse, pictured with his trophies at Nottingham by the tank displaying his Gymnotus carapo

BREEDER'S NOTEBOOK

Breeding the Egyptian Mouthbreeder

By J. DUNCAN

IF I was asked what was the easiest egg layer to breed I would say the Egyptian mouthbreeder. It does not need a big tank, it is not fussy about water conditions, and by the time the female lets the fry go they are swimming and are a good size.

My first pair were bought in Club Row, London on a Sunday morning, and by the evening I noticed that the female had eggs in her mouth. At that time I had only two community tanks, and so I sectioned off one end of a 24 in. by 12 in. by 12 in. tank to give a width of about 4 inches. After about 14 days I had approximately a dozen young. I put the female back into the main part of the tank. After a month she once again had eggs in her mouth. In the meantime my dozen fry had dwindled down to five, and these I gave away to make room for the new brood, but of these only four survived and they died before they reached maturity. During this time the male died also.

I did not buy any more of these fish until this year, on a club trip to McLynn's Aquarium, Ewhurst. I purchased six, two of which went to a friend who was not on the trip, and of the remaining four only one was a male. As I thought these fish were too young to breed they were placed in a community tank, but it was only a matter of days before the largest of the females had a mouthful of eggs. Owing to lack of space she was placed in a 6 in. by 4 in. plastic container floating in a tank, and six young were born. I kept them in this container for a week, and then put them in a tank with some young fighters. By now the other two females had eggs and so they were placed in containers. At this time I started to reorganise my tanks, and so I took the six young to Pets Corner Aquarium. This time I was not so lucky, as both females spat out their eggs after a week when the fry were in a very immature state.

I decided then that the only way to breed these fish was to take it seriously and set up a tank just for this purpose. A tank was cleaned out and planted, and into this I placed my four fish. The idea was to let the male choose his own mate and then remove the other two. For several days nothing happened, and then one night I noticed a lot of small holes dug in the gravel and all the females with eggs in their mouths, with the male looking very sorry for himself. His mouth was wide open, and he was unable to close it. I presumed that as cichlids lock jaws when mating he had severely dislocated his jaw. I removed him to a community tank, where he soon recovered.

The three females settled down to a quiet 14 days' incubation, each adopting her own territory. At the end of the fortnight things began to happen. The females began to push one another about, and then I noticed that one female had only a few young in her mouth and yet there were none swimming about. I wondered what had happened to them until another female swam into view with her mouth overflowing with fry. As fast as the first one had been letting them out she had been taking them in!

At this point I put all the females into separate containers, and then when the fry were free-swimming they were put together in a tank, and all the females into another tank to have a good feed. The fry were fed on Liquifry for a day or two, then on micro worms until they were big enough for adult food. From this brood I got about 40 young fish.

Obviously this is not the best way to breed the Egyptian mouthbreeder, but it does illustrate just how easy they are to breed.

Nottingham Show Report

Continued from page 317

RESULTS: 1, Mr and Mrs J. and H. Dernie; 2, Mr P. Reynolds. Cichlid, severum type: 1, Mr K. Binns; 2, Mr G. Wardlow; 3, Mr R. F. Oliver. Acara type: 1 and 2, Mr K. Binns; 3, Master A. Middleton. Angels: 1, Mr F. Underwood; 2, Mr G. Boothby; 3, Mr and Mrs J. and H. Dernie. Jewel fish: 1, Mr R. P. Warren; 2, Mrs J. K. Smith; 3, Mr F. W. Saywell. Cichlids under 3 in.: 1, Mr E. N. Gee; 2, Mr W. Taylor; 3, Master D. Beard. Cichlids over 3 in.: 1, Mr W. Taylor; 2, Mr I. H. Hunt; 3, Mr Morrell.

Lyretails: 1 and 3, Mr E. B. S. Stockdale; 2, Mr G. H. Colton. Panchax: 1 and 2, Mr A. Wood; 3, Mr and Mrs J. and H. Dernie. Rivulus: 1, Mr and Mrs J. and H. Dernie. Top minnows, a.o.a.: 1, Mr J. H. Colton. *Corydoras* sp.: 1, Mr P. Reynolds; 2, Master A. Middleton; 3, Mr T. Kelly. Catfish, a.o.a.: 1, Mr W. Parkin; 2, Mr and Mrs J. and H. Dernie; 3, Mr W. Parkin. Kuhli loach: 1, Master D. Beard; 2, Mr B. W. Forman; 3, Master I. Underwood. *Cobitidae* a.o.a.: 1, Mr G. Hodgkinson; 2, Mrs I. Bullyment; 3, Mr P. Reynolds. *Melanotaenia* sp.: 1 and 3, Mr P. Reynolds; 2, Mrs J. K. Smith. A.o.a. tropical fish: 1, Mr P. S. Moorhouse. 2, Master P. Cox; 3, Mr P. Reynolds.

Pairs, gouramis: 1, Mr D. Halford; 2, Mr E. Price; 3, Mr and Mrs J. and H. Dernie. Pairs, barbs: 1, Mr W. Parkin; 2 and 3, Mr and Mrs J. and H. Dernie. Pairs, characins: 1, Mr S. Hill; 2, Mr P. S. Moorhouse; 3, Mr D. Halford. Pairs, cichlids: 1, Mr and Mrs J. and H. Dernie; 2, Mrs A. M. Hurt; 3, Mrs C. M. Beard. Pairs, livebearers: 1, Mr and Mrs J. and H. Dernie; 2, Mr F. Underwood; 3, Mrs I. Bullyment.

Tropical marine sp.: 1, Mr W. Parkin. Tropical furnished 10 × 6 × 6 tank: 1 Mr D. G. Holland, 2, Mr D. G. Holland; 3, Mr P. Bates. Tropical furnished 20: 1, Mr P. Reynolds; 2, Mr K. T. Tiller. Tropical furnished 20, marine: 1, Mr A. Harper.

Breeders egglayers: 1, Mr W. Taylor; 2, Mr and Mrs J. and H. Dernie; 3, Mr G. Bullyment. Breeders livebearers: 1, Mr and Mrs J. and H. Dernie; 2, Mr J. G. Hunt, 3, Mr J. Amott.

Transatlantic TOPICS

By JIM KELLY

IN California exists the contradictions of the American way of life, or for that matter, human nature anywhere. Technologically speaking the most advanced area in the world, it houses the world's largest university, has 7-year-olds in Palo Alto training to use computers and as if to offset all this can rock the world with the explosions like the Watts riots.

California to an aquarist means Steinhart Aquarium, but a report I received recently proves that this isn't the only outstanding 'fishy' interest in this part of the world. A workshop and seminar held at the International Hotel in Los Angeles, attracted some 250 representatives of the pet field. Every day workshop sessions consisting of four seminars explored various topics under the guidance of a chairman who was an expert in that particular field.

Subjects covered fish merchandising, feeding, filtration and display, and were discussed under the expert guidance of Ken Perry. He was constantly under fire but drawing on his experience his answers came back quicker than an interceptor missile; on the topic of filtration, Ken had this to say: 'Though several gave the pros and cons of various filtration systems, I told them that any of these would work when used properly and when the limitations of each method were understood!'

The meetings, sponsored by the American Pet Products Manufacturer's Association, were a huge success, and much of what was learned at the discussions will be passed back to the hobbyist.

* * *

It doesn't take the song 'Three Coins in The Fountain' to remind Roman sojourn to see a 'Trevi' in every stretch of undisturbed water. The wishing well seems to be part and parcel of the modern scene, even if the wage-freeze has changed the coins to all kinds of things one finds in one's pockets.

For nearly 40 years the staff at Steinhart Aquarium, San Francisco, California, have done their best to prevent the public from participating in the pastime—the target invariably being the alligator pool situated in the entrance foyer.

Guards were posted; signs were conspicuously displayed warning the public that anyone caught throwing anything into the pool would be prosecuted; all in vain, their efforts were as useful as a milk bucket under a bull.

The aquarium coined the word *ballomania*, when diagnosing the followers of this deep-rooted, genetically based impulse, but as zoo and aquarium keepers know the world over, it's like eating nuts, one finds it difficult, when started, to stop.

If you think this a harmless activity, perhaps some figures published of what was taken from the alligator pool will convince you that it is dangerous to the occupants: pennies (per month), from 6,388 to 14,119; nickels, 797 to 3,992.

Other coins represented the currency of over 43 countries, to say nothing of hundreds of rubber bands, bottle tops, marbles, shells, small pieces of jewellery and even dice!

With that last word in mind I implore our readers to avoid this practice if any livestock occupies the water. Charity wishing wells are fine, but too many fishes and other creatures are dying by either swallowing the objects or having the water poisoned by their presence.

* * *

Film producers seem to revel in the title 'Silent World' when making epics of the deep but recent scientific research seems to show that the waters of the world are anything but silent!

We are all familiar with the work being carried out with the dolphin but perhaps not so familiar are the tape recordings made by Vladimir Protasov. This brilliant fish scientist has spent years recording the sounds made by various aquatic creatures; title of top talker goes to the white sturgeon, who, according to Protasov, howl, yell, whistle and even grind their teeth together!

As if to counteract these claims there was the professor from Wisconsin University who stated that dolphins aren't really talking when they emit grunts and whistles, they are merely announcing their position to other dolphins. After seeing and hearing a dolphin I am leaving the last word in this argument to the animal.

* * *

Remember my announcement of the first Betta Convention (see this column, PFM, September)? Well, I am happy to report that it was a success. With over 200 fighting fish entered in the show, competition was stiff, most of the trophies going to George Torres from New York. Other winners came from Illinois Milwaukee and Wisconsin.

One interesting feature of the show adjudication was the use of hand torches by the judges to examine the true colours of the fish; this is keenness that makes a Super Gillette blunt by comparison.

It has already been decided to repeat the event next year at Columbus, Ohio. To *Betta* enthusiasts of Great Britain, watch this column for more details nearer the event; it would be nice to see the Union Jack flying on the winner's rostrum in 1968.

* * *

Fish tanks invariably find their way into the strangest of places, but one of the strangest must be a large tank situated amongst the coffins in a 'mortician's parlour' in the deep south.

My correspondent wrote that, approaching it, he guessed it would be full of angel fish but was surprised to find the tank housed a number of red-tailed sharks! Perhaps in keeping with the American high cost of dying?

* * *

Browsing every month through the large amount of club magazines and reports I receive from the States gives me a good insight on their activities. One such report came from a group of aquarists on the West Coast, who had just held a debate on how they could brighten up their

Continued overpage

Medway Returns with a Splash

Part of the Medway display in a modern school hall

A SUNNY autumn day, a view of the yachts glittering on the Medway from the windows, and the spacious modern school in which it took place undoubtedly gave the first open show held by **MEDWAY A.S.** for 17 years a fine background, but, for the smooth-running arrangements that made the show a really model effort, all praise to the sheer hard work and the forethought of the organisers and club members! Visitors were met by an official and told of the timetable of events and directed to the lecture hall while the judging took place. There, Mr Norman Bennett of Weymouth gave a lecture on water lilies and water gardening illustrated with very fine coloured slides. Children were provided with their own film show, a non-stop entertainment of cartoons and shorts, with plenty of suitable refreshments and a set tea for those who had booked it. An interesting arrangement of the 253 fishes benched provided for their grouping in sections placed separately throughout the hall so that the effect was of curved walks rather than the more usual linear effect that often must be used to economise on space. Judging from the vast displays of dahlias in the hall, some Medway fishkeepers must be very keen gardeners as well. The best fish in show award went to the scat belonging to Mr L. Johnson and Medway itself won the award for the club furnished aquaria, with the St. John Fisher School second. The arrangement by Mr J. Marshall of Medway A.S. in the individual furnished aquaria, with a skilled use of light-tone bark, won him first place (2, Mr B. Clare; 3, Mr Chater). The SOUTH LONDON SECTION of the **FANCY GUPPY ASSOCIATION** also took part and made the following awards: best male, Mr M. Levi; best female, Mr T. Croucher; best breeders, Mr T. Croucher.

Detailed results were:

Fighters: 1, Mr K. Brown (Medway); 2, Mr J. Marshall (Medway); 3, Mr A. Wright (Medway); 4, Mr R. Parsons (Medway). Egglaying toothcarps: 1, Mr K. Owens (Catford); 2, Mr J. D. Wilson (Catford); 3, Mr R. Pearson (Freelance); 4, Mr B. Clare (Medway). Platys: 1 and 2, Mr F. E. T. Smith (Catford); 3, Mr D. Summers (Medway); 4, Mr C. Elliott (Medway).

A.v. mollies: 1, Mr A. J. McCarthy (Catford); 2, 3 and 4, Mr M. J. Smith (Walthamstow). A.v. swordtail: 1 and 4, Mr A. Jamieson (Catford); 2, Mr M. J. Smith (Walthamstow); 3, Mr J. D. Wilson (Catford). Danios, rasboras, minnows: 1, Mr A. Harding (Erith); 2, Mr D. Summers (Medway); 3, Mr J. D. Wilson (Catford); 4, Mr K. Brown (Medway).

Labyrinths: 1, Mr C. Elliott (Medway); 2, Mr D. G. Green (Medway); 3, Mr J. Bell (Medway); 4, Mr C. Larly. Characins: 1, Mr D. Wright (Medway); 2 and 3, Mr D. Chennells (Catford); 4, Mr J. Bolton (Erith). A.v. barbs: 1, Mr S. Clark (Erith); 2, Mr G. Hodkinson (Medway); 3, Mr M. Jones (Erith); 4, Miss Anne Wright (Medway).

Catfish: 1, Miss Anne Wright (Medway); 2, Mr B. Pearson (Freelance); 3, Mr A. Jamieson (Catford); 4, Mr J. Marshall (Catford). Cichlids: 1, Mr G. Scott (Erith); 2 and 3, Mr B. S. Pepper (Sittingbourne); 4, Mr G. A. Craft (Medway). A.o.v. tropicals: 1, Mr L. Johnson; 2, Mr K. Brown (Medway); 3, Mr D. Chennells (Catford); 4, Mrs Dunston (E. Dulwich).

Egglayers breeders: 1, Mr J. D. Wilson (Catford); 2 and 4, Mr B. Clare (Medway); 3, Mr C. M. Heather (Medway). Livebearer breeders: 1, Mr J. D. Wilson (Catford); 2, Mr J. Cooley (Sittingbourne); 3, Mr B. Collins (Sittingbourne); 4, Mr J. Marshall (Medway). Tropical rooted plant: 1 and 3, Mr J. Marshall (Medway); 2, Mr C. Elliott (Medway); 4, Mr B. Clare (Medway).

Transatlantic Topics

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annual fish show and attract more entries.

The usual cliches were trotted out, including the suggestion that the prizes given should include valuable items like complete set-ups, books and even T.V. sets. Usually when this subject is under discussion by a British group the question of finance crops up: 'how are we going to pay for them?' is the cry, not only from the treasurer.

This set me thinking about our entrance fees. Varying from around sixpence to 2 shillings for the big shows, these fees have varied little over the past two decades. Despite the fact that everything else has increased in price, fees, both exhibitors and membership, have remained pegged.

* * *

Goldfish still 'Top the Pops' as far as the commonest fish kept in the U.S.A. Recent statistics show that 25,000,000 (yes, I've got the noughts right!) are sold annually; one interesting fact to emerge from these figures was that one in eight families living in rural areas had a goldfish in their homes; enter the cities and the figure changes to one in five! There's gold in them there fish!

* * *

Advertisement from a New Jersey paper: Professional 'minder' will come and sit with your pet fish, nights and week-ends. Also tropicals boarded during your vacation. Reasonable terms.

A recent winner of their 'Opportunity Knocks' programme, no doubt!

Aphyosemion australe (male fish). Picture by A. Stevens of Hendon A.S.

An African Toothcarp for the Breeder

By B. J. PAWLEY

THIS toothcarp is one of the most beautiful of the genus *Aphyosemion*, and comes from Africa, around the Cape Lopez region, hence the common name, Cape Lopez lyretail. The majority of toothcarps are small in size, and the *australe* is no exception, being at the most 2½ in. for the male and 2 in. for the female.

As regards coloration, the male is something that has to be seen to be believed. The body is a dull brownish red sprinkled with red spots. Gill covers and the area immediately behind have a bluish green tint, the dorsal and anal fins are a dull orange, bordered with a black line and white pointed tips; this coloration extends into the caudal fin, which has beautiful white extensions giving a perfect 'lyretail' shape. During the spawning period the whole fish deepens in colour, making the white tips to the fins stand out in contrast to the rest of the body. The female is drab by comparison, being a pale brown, with just a few spots on her body; she also lacks the pointed finnage.

Water requirements of the *australe* are the same as those for other African toothcarps, i.e. peat filtered rainwater, which should be crystal clear and giving a pH value of between 6·5 to 7·0, and a total hardness reading of 2° D.H. (34 p.p.m.). The best method of collecting this is via the guttering of a greenhouse, or conservatory, or in fact anything that has a glass roof. The rainwater is fed into a large container with a 6 in. depth of sedge peat on the bottom. The peat serves two purposes; it acidifies the water and also, over a period of time, the water becomes softer.

An ideal tank for this species is an 18 in. by 10 in. by 10 in. thickly planted with cryptocorynes, and a cover provided by Indian fern, or *Riccia*, and this keeps the tank nicely shaded, as the *australe* is inclined to be 'light-shy'.

Their food requirements are fairly simple, as they are not fussy, and any live or good meaty, dried or frozen food is greedily taken, but live food in the form of *Daphnia*, white worm etc., is essential for bringing

them into condition for breeding, and this also applies to any species of fish.

The males are inclined to be aggressive towards one another, so it is better to keep them in pairs, or give the male a small harem, say two or perhaps three females, and under these conditions they readily breed. The eggs, which are clear at first and quite large for the size of the fish, are deposited on the plants, both at the surface and at the roots, over a period of several weeks. The parents if well fed show little or no interest in their young, although it is perhaps wise to remove them as soon as they are large enough.

For serious breeding, however, it is advisable to give a pair a tank to themselves, with a water depth of about 6 in., and a temperature of 72°F (22°C); too high a temperature shortens their lives, and is also liable to stop them breeding. Add to the tank two nylon wool mops. The water previously described is suitable. As with most species it is advisable to separate the partners for a week before spawning and feed them mostly live food, whereupon the female should fill out slightly with eggs.

When everything is ready, the pair can be put together in their breeding tank, and it won't be long before the male shows an interest in the female. His colours will deepen, and with spread fins he will start to chase her. They then quiver side by side among the nylon wool mops, as one egg at a time is laid and fertilised. The eggs are adhesive and stick to the strands of wool. About twelve eggs are laid each day for several weeks. The female can be removed from time to time to give her a rest, and then replaced with her mate after 2 or 3 days; alternatively two females can be used on rota.

The eggs are removed from the mops every other day, and placed in 1 in. depth of water from the breeding tank, in a shallow container, such as a plastic sandwich box. If all of the fry are to be raised, then several boxes will be needed. Keep the eggs at a temperature of 72°F and in 12 to 18 days the eggs will hatch.

During the days of incubation the fry will have absorbed their yolk sac, therefore they will require feeding almost immediately from birth. Brine shrimp and micro worm can be given for 10 days, but as the fry grow fairly rapidly, after the tenth day Grindal and chopped white worm should be introduced into their diet, and a length of 1½ in. is obtained in about 9 weeks, at which time the sexes should be separated. Adult size is reached in 3 months.

The care and trouble that the *Aphyosemion* demand is, believe me, well worth it, for it is a wonderful sight to see a tank of young male *australe*, and even more wonderful to see this toothcarp in full breeding dress.

Readers' Queries Answered

Chaca chaca

Can you tell me something about the Chaca chaca fish seen recently at an open show?

The shape of this fish has been called 'tadpole-like', with a very broad mouth and a thick, horny skin. In colour it is a blotched black-brown and since it is a lethargic, largely unmoving fish in its native habitat in India, Burma and Borneo, it looks remarkably like a piece of drifting wood. Its requirements are very much like those of the more familiar *Clarias*. As a nocturnal fish, it requires a place in which it can hide away, a tangle of roots, hollowed rocks and dark, preferably soft, bottom covering. It is omnivorous and will take earthworms, *Tubifex*, minced meat and fish scraps.

Pop-eye

The eyes of one of my angel fish suddenly started to protrude. It is no longer feeding, and I have separated it in a small tank. I am told that there is no cure but I am not certain whether or not it is suffering from a disease that will affect the other fishes.

Angel fish are susceptible to attack by the parasite *Ichthyosporidium*, that can infest many parts of a fish's body. The symptoms vary according to the part affected, but when the eyes are attacked, exophthalmos or eye-protrusion will occur. It is true that no effective treatment is yet in use, and it is only possible to remove the fish showing the eye-protruding symptoms from the community tank and keep it in a separate container or destroy it.

It is possible that more than one fish in the tank may be serving as host to the parasite, but if, for instance, the parasite is lodged in an internal organ there may well be no external symptoms. Short of destroying all the fishes in the tank, it is only possible to leave the tank undisturbed and to watch the remaining inhabitants carefully, making certain at the same time that all other factors, such as a varied diet and clean tank, are operating in the fishes' favour. Under good conditions the fishes themselves can provide their own relief from the danger—by a natural process whereby the parasites in their bodies become enclosed in cysts that prevent the spread of the disease.

Eye-protrusion sometimes occurs, without evidence of parasites being present, in older fishes, but the cause of this is unknown and again there is no reliable remedy.

Tinfoil Barbs

Please give me information on the care and requirements of tinfoil barbs.

Barbus schwanenfeldii requires, first and foremost, space. It is going to become very large, 6 in. in length

being no unusual sight, and therefore needs plenty of swimming room. It is an omnivorous feeder (which will include small fish such as worms, as well as young plants) and requires plenty of food of a sufficient size. Large-flake foods, tablet foods, *Tubifex*, garden worms, pieces of raw meat and liver, pieces of fish—all will be taken by the timid barb. As most tank owners are not prepared to supply the fish's plant-food requirements with young weed plants, the tank should contain plenty of duckweed or lettuce for it to eat.

Dwarf Plants

Can you please give me the names of some small plants that I can obtain readily for use in the front part of the aquarium that are not going to grow too tall? It seems to be very difficult to obtain real dwarf varieties. At the moment I am making do with cuttings of Hygrophila *and* Cambomba, *but the dimensions of the leaves are such that they do not really look like small plants.*

Plants that remain small and can therefore be used in the foreground of the aquarium are not numerous but there are a few varieties that can usually be obtained without too much difficulty. The dwarf Japanese rush (*Acorus gramineus* var. *pusillus*) has a bright-green, spiky leaf, grouped in a fan shape. It grows no more than about 2 in., looks very attractive and almost never serves as a fish titbit. The pygmy chain sword (*Echinodorus tenellus* var. *martii*) grows to between 2 and 3 in. in height and spreads freely by means of runners. The light-green leaf of *Cryptocoryne willisii* also makes a very pretty foreground plant, particularly when placed in front of rockwork.

One Blind Eye

One of my fancy goldfish has lost an eye. Although it seems to be managing in the tank, I am not certain whether it might not be kinder to destroy it.

No, blindness in one eye does not incapacitate a fish very much though a totally blind fish might have to be destroyed. Most eye complaints, where opacity of the eye surface occurs, are incurable, but if the eye has actually been removed then it would be advisable to consider the other tank inmates. Sunfish and basses and the American catfish *Ameirus nebulosus*, for instance, do not make suitable tank companions for fancy goldfish.

Goldfish Diet

I understood that earthworms were the best possible food for goldfish and have been feeding mine on an exclusive diet of earthworms for the last few weeks. The fish seem to be in very fine condition, but have become rather nervous. Could it be due to the change in the diet?

The ordinary garden earthworm is undoubtedly an excellent food for goldfish, but no single type of food should be fed with exclusively. Although the goldfish is well equipped to digest carbohydrate food it is less well able to cope with large quantities of meaty (protein) food. The goldfish is predominantly a herbivorous fish, an eater of plant foods, and also usually has a fine variety of live food available to it in the pond. These include *Daphnia*, mosquito larvae, blood worms, *Asellus* and the freshwater shrimp, *Gammarus*, as well as the occasional earthworm. To ensure that the fish is obtaining all its nutritional requirements under the artificial conditions of the aquarium, it is much better to feed as varied a diet as possible. As well as the proprietary packeted fish foods, many of which do contain a blend of ingredients to form a balanced mixture, oatmeal, vitamin cereals such as Bemax, dried shrimp, brown bread, hard-boiled egg yolk, spinach, cauliflower and mashed potato will all be accepted. It may be that the change of diet has upset the fish; they are certainly not receiving a balanced diet.

Winter Feeding

Exactly when do I stop feeding my pond goldfish for the winter?

The amount of food taken by goldfish and the frequency with which they require feeding is directly related to water temperature. It has been found that the fish eat most at about 60° to 65°F (15–18°C); below 50°F (10°C) the fish stop eating. They can, then, be fed up to such time as the first ice forms, but the amount of food given will need to be progressively reduced. It is a very good idea to feed pond fish always in the same area and at the same time of day—then any change in feeding behaviour is easily recognisable. As soon as the fish lose interest in their food no more should be added to the water. During the cold season, particularly in the early part of the winter and in the spring, warm spells of weather may occur and with the rise in temperature the fish may feel a little more active and hungry. They can then be fed with something they are known to take readily, and if advantage is taken of these warm spells to offer a little food, this will help to sustain the fish through the inactive periods.

Pond Cleaning

My pond has been untouched for 4 years now—largely, I must admit, because I keep putting off the task of cleaning it out. This year it must be done. Can you give me a few hints please?

Garden ponds benefit by a thorough cleansing once every 3 or 4 years to prevent the building up of too thick a layer of decomposing material on the bottom. The best time to clean out a pond is in the spring, or in the late autumn after the leaves have fallen from the trees. The water should be siphoned out (unless special provision was made for emptying when the pond was built, a garden hose filled with water and laid from under the surface in the pond to a house drain should serve the purpose). If fish are present, they can be caught when the pond is already half-empty and placed in large containers previously filled with pond water. Pond fish in particular are not going to be happy if overcrowded into a small holding tank while the pond cleaning is being done. All the material from the bottom of the pond should be cleaned and the water plants washed well and freed from strands of blanket weed and other algae. They must, of course, be kept submerged in water until replanted. The pond walls should be scrubbed, or wiped, depending on the material of which they are made, and rinsed thoroughly. After the pond has been partially refilled, the plants can be put back, the pond filled, and the fish returned in a day or two.

Club News

A SLIDE AND TAPE show of the club's activities, presented on a T.V. screen, proved to be an excellent way of interesting the general public in the hobby when **HARLOW A.S.** held their first open show at the Harlow Town Show. From 235 entries, Mr M. Panton of Harlow won the best fish in show award with an albino tiger barb and also the F.B.A.S. trophy. Tottenham A.S. took first and second place in the furnished aquaria class (3, Walthamstow A.S.; 4, Harlow A.S.) and the Challenge Cup for the club with the greatest number of points went to Harlow A.S. Detailed results were:

A.v. guppy: 1, Mr F. Daley (Harlow); 2, Mr D. Durrant (Thurrock); 3, Mrs R. Burton (Harlow); 4, Mr Holmes (Mid-Herts). A.v. fighters: 1, Mr T. D. Smith (Hendon); 2 and 3, Mr D. Durrant (Thurrock); 4, Mr J. Duncan (Harlow). A.v. toothcarp: 1, Mr B. Pearson (Freelance); 2, Mr R. Oliver (Harlow); 3 and 4, Mr J. Stones (Harlow). A.o.v. livebearers: 1 and 2, Mr M. Smith (Walthamstow); 3, Mr P. Wensel (Harlow); 4, Mr A. Duyfor (Harlow).

A.v. danio, rasbora, minnow: 1, 2 and 3, Mr M. Panton (Harlow); 4, Mr S. Morgan (Harlow). A.o.v. labyrinth: 1, Mr L. Latimer (Harlow); 2, Mr E. Nicoll (Thurrock); 3, Mr A. Duyfor (Harlow); 4, Mr R. Wallis (Harlow). A.v. characin: 1, Mr R. Kerridge (Harlow); 2, P. Burton (Harlow); 3, Mr M. Smith (Walthamstow); 4, Mr P. Burton (Harlow). A.v. barb: 1 and 4, Mr M. Panton (Harlow); 2 and 3, Mr R. Kerridge. A.v. catfish: 1, Mr P. Burton (Harlow); 2, Mr D. Durrant (Thurrock); 3, Mr F. Williams (Tottenham); 4, Mr E. Nicoll (Thurrock). A.v. cichlid: 1, Mr E. Gee (Witham); 2, Mr P. Burton (Harlow); 3, Mr R. Kerridge (Harlow); 4, Mr D. Duncan (Harlow). A.o.v. tropical: 1, Mr E. Gee (Witham); 2 and 3, Mr T. D. Smith (Hendon); 4, Mr Holmes (Mid-Herts).

MEMBERS of the LIVERPOOL SECTION of the **FANCY GUPPY ASSOCIATION** are always pleased to welcome visitors to meetings and at the September meeting they were delighted to have two parties of visitors present, one of old friends from Manchester and the second of friends from Newport on a first-ever visit. Both parties expressed appreciation of the hospitality and promised a return visit. The meeting took the form of an open discussion and newer members really appreciated the practical advice they received from the 'older' hands. There was a record entry of 150 at the table show that followed and Mr Ennis of Newport proved his journey was really necessary by winning the award for the best fish in show. Those interested in joining this friendly group should contact Mr Bill Armitage, 12 Orrell Lane, Liverpool 9.

HOW TO WIN friends and influence people? **HARWICH & D. A.S.** have solved the problem by staging a public show at a local hotel. After giving members of the general public a glimpse of the hobby two years ago, this full-scale exhibition was mounted. 25 furnished and individually heated tanks of various sizes were set up over two evenings and the 400 fishes of 55 species were all supplied by members of the club, together with the equipment. There were shoals of angels, neons, Buenos-Aires tetras, delta guppies, swordtails and zebras (of which only the neons were not bred locally). These were joined by Japanese weather loaches, scats, large severum, Malayan angels, and many other varieties. A most helpful catalogue was issued listing the fish in each tank by their common names and giving the measurement to which a good specimen would grow and its country of origin. Club members were on hand to answer queries and the many enthusiastic comments overheard from the public, with references to the show as a 'miniature London Zoo', were felt to have made the hard work involved well worth while.

HOUNSLOW & D. A.S. report that they are now in the throes of their competitive season and have entered the A.S.L.A.S. league. This has taken the place of the old A.S.L.A.S. Knockout Competition and it is hoped that the new idea will enable more clubs to get to know each other and eliminate the early 'sudden death' of societies losing in the preliminary rounds. Each club has to enter in four classes of 3 fish and the home team has the first choice of nominations of 2 of the classes. Hounslow's first venture, which they anticipate with great enjoyment, is with ROEHAMPTON A.S.

One of the other functions that the society has supported is the annual marathon sponsored by the Feltham Garrison. Hounslow put on a first-class exhibition of exotic fish that created very great interest amongst the general public attending the event.

The normal fortnightly meetings of the society continue to be well supported and upwards of 40 members seems to be the rule these days at practically every one. At the last meeting members were entertained by a most interesting talk from Mr Ray Leggatt, the club's new Australian member, on the hobby 'down under', where hobbyists seem to have just as many problems as we do even if they are of a completely different nature. Recent table show results are: A.o.v. egglayer: 1 and 2, Mr D. Woodward; 3, Mr S. Hall. A.v. catfish and loach: 1 and 2, Mr J. Thorne; 3, Mr Chris Bunce.

New members are always welcome at meetings, held on alternate Wednesdays at the Isleworth Community Centre; details can be obtained from secretary, Mr Derek Woodward, 16 Ellerdine Road, Hounslow, Middlesex.

EXHIBITORS from far afield journeyed to Yate in Gloucestershire to attend the **YATE & D. A.S.** first open table show, and fish from Weymouth, Trowbridge, Cheltenham and Bristol and surrounding districts were benched. The Cup for the best fish in show was presented to Mrs P. Wright (Bristol Tropical Fish Club) for her *C. julii*. The exhibitor with the highest points in the show was Mr J. Wheeler from Trowbridge.

Other results were:

Male guppies: 1, Mrs P. Wright (Bristol T.F.C.); 2 and 3, Mr F. Brown (Bristol A.S.); 4, Mr V. C. Howes (Cheltenham). Female guppies: 1, Mr F. Brown (Bristol A.S.) 2, Mr W. Gadd; 3, Master A. Arnold. Swords: 1, Mr C. K. Cradock (Keynsham); 2, Mrs P. Wright (Bristol T.F.C.); 3, Mr F. Brown (Bristol A.S.); Platys: 1, Mr J. Wheeler (Trowbridge); 2, Mr D. Walsh (Yate); 3, Mr G. Davies (Yate). A.o.v. livebearers: 1, Mr E. Haines (Yate); 2, Mr W. Bushel (Yate); 3, Mr F. Brown (Bristol A.S.); 4, Mr J. Wheeler (Trowbridge).

A.v. characin: 1, Mr A. G. Cox (Weymouth); 2, Mr D. Walsh; 3, Mr F. Brown (Bristol A.S.); 4, Mr C. K. Cradock (Keynsham). Danios, minnows, rasboras: 1, Mr A. G. Cox (Weymouth); 2, Mr J. Wheeler (Trowbridge); 3, Mr R. Buckley; 4, Mr F. Brown (Bristol A.S.). A.v. catfish or loach: 1, Mrs P. Wright (Bristol T.F.C.); 2, Mr F. Brown (Bristol A.S.); 3, Mr E. Haines; 4, Mr J. Wheeler (Trowbridge).

A.v. cichlid: 1, Mr N. Binding (Cheltenham); 2, Mr E. Verinder; 4, Mr A. Snell (Yate). Dwarf cichlids: 1, Mr A. Snell (Yate); 2, Mr J. Wheeler (Trowbridge); 3, Mrs P. Wright (Bristol T.F.C.); 4, Mr R. Gale (Bristol T.F.C.). Barbs: 1, Mr C. Calway; 2 and 4, Mr A. G. Cox (Weymouth); 3, Mr F. Brown (Bristol A.S.). Anabantids: 1 and 3, Mr J. Wheeler (Trowbridge); 2 and 4, Mr C. K. Cradock (Keynsham). Fighters: 1, Master A. Arnold.

A.o.v. tropical: 1, Mr R. Jane (Yate); 2, Mr E. Verinder; 3, Mr C. Calway; 4, Mrs P. Wright (Bristol T.F.C.); Breeders livebearers: 1 and 3, Mr J. Wheeler (Trowbridge); 2, Mr F. Brown (Bristol A.S.); Breeders egglayers: 1, Mr J. Wheeler; 2, Mr W. Gadd; 3 and 4, Mr A. G. Cox (Weymouth). Furnished jars: 1, Mr V. C. Howes.

THE **FEDERATION OF SCOTTISH AQUARIST SOCIETIES** held their September Convention at Perth this year, when PERTH A.S. were the host society. The Convention was addressed by Mr Derek McInerny, the well-known aquatic author and principal of McLynn's Aquarium in Ewhurst, Surrey. He

spoke on the keeping, breeding and rearing of tropical fish and gave a hint of future developments when he assured the assembly that there was a future for tropical marines without all the equipment that was thought at present to be necessary.

Results were:

Guppies (30 entries): 1 and 2, Mr A. Wallace (Lobster trophy; Glasgow F.G.A.); 3 and 4, Mr and Mrs Love (Lanarkshire).

Mollies (15 entries): 1, Mr R. Paterson (Kinneil Cup; Lanarkshire); 2, Mr K. Jamieson (Whitburn); 3, Mr T. Cochrane (Alloa); 4, Mr D. Bonner (Weir's).

Characins A (25 entries): 1, Mr D. Young (N.E.L.); 2, Mr J. Mollison (Ayr-shire); 3, Mr G. Ross (Kirkcaldy); 4, Mr A. Sinclair (Renfrewshire). Characins B (17 entries): 1 and 4, Mr P. Haggarty (Lanarkshire); 2 and 3, Mr A. Watt (Alloa). Characins C (17 entries): 1, Mr A. Wallace (Gordon B. Kirkland trophy; Glasgow F.G.A.); 2, Mr T. McDonald (Whitburn); 3, Mr W. Low (Scottish); 4, Mr D. Gil-mour (Weir's).

Rasboras (24 entries): 1, Mr J. Rawlings (Kensington trophy; Moray); 2, Mr A. Arthur (Kirkcaldy); 3, Mr H. McGuire (Dunfermline); 4, Mr J. Turner (Kirkcaldy).

Danios, minnows (16 entries): 1, Mr J. Graham (Malabar trophy; Ayrshire); 2, Mr P. Haggarty (Lanarkshire); 3, Mr D. Ford (Edinburgh); 4, Mr H. McGuire (Dunfermline). Catfish A (19 entries): 1, Mr G. Steel (Caledonia Cup and Alexander Cross trophy; Lanarkshire); 2, Mr S. Naismith (Lanarkshire); 3, Mr W. Smith (Moray); 4, Mr H. McGuire (Dunfermline). Catfish B (11 entries): 1, Mr W. Low (Scottish); 2, Mr D. Copland (Scottish); 3, Mr K. Jamieson (Whitburn); 4, Mr O. Sharkie (Lanarkshire). Loaches (15 entries): 1, Mr and Mrs Love (Botia Cup; Lanarkshire); 2 and 3, Mr G. McKechnie (Falkirk); 4, Mr L. Payne (N.E.L.).

Coldwater (15 entries): 1, Mr K. L. Brown (Cathay trophy; Scottish); 2, Mr G. Orr (Perth); 3 and 4, Mr N. Baines (Ayr-shire). Nominated pair, dwarf gouramis (7 entries): Kirkcaldy & D. A.S. (Andrew Bell Memorial trophy); 2, Lanarkshire A.S.; 3, Ware A.C.; 4, Ayrshire A.S. Aquarium plants (8 entries): 1, Mr S. Naismith (Lanarkshire); 2 and 4, Mr A. Jeffrey (Lanarkshire); 3, Mr G. McKechnie (Fal-kirk).

Breeders livebearers A (2 entry): 1, Mr A. Wallace (Dundee shield; Glasgow F.G.A.). Breeders livebearers B (other than guppies 3 entries): 1, Mr A. Watt (Alloa); 2, Mr P. Haggarty (Lanarkshire); 3, Mr S. Naismith (Lanarkshire); 4, Mr L. Phillips (Whit-burn). Breeders livebearers B (guppies 14 entries): 1, 2, 3 and 4, Mr A. Wallace (F.G.A. trophy and Strachan Kerr trophy; Glasgow F.G.A.). Breeders egglayers A (20 entries): 1 and 2, Mr A. Watt (Gourlay shield; Alloa); 3, Mr J. Edmiston (Moray); 4, Mr G. Ross (Kirkcaldy). Breeders egg-layers B (20 entries): 1, Mr A. Watt (Green-nock trophy; Alloa); 2, Mr E. Watson (Lanarkshire); 3, Mr G. Reid (Alloa); 4, Mr G. McKechnie (Falkirk).

The best fish in show award went to Mr George Steel of Lanarkshire for his *C. paleatus* with which he won the Alex-ander Cross Trophy out of 196 entries.

High Wycombe's Annual Open

THE MARQUEE that housed the **HIGH WYCOMBE A.S.** annual open show attracted a very great number of interested onlookers who were attending the town's show, of which the club's display formed a part. Crowds filed past the 330 benched entries all the afternoon. The prizes included three new trophies donated by members of the society. These were the Ann Seed Rose Bowl, the 1967 Committee Chal-lenge shield and the Chatfield Characin trophy. The best fish in show award went to the *C. julii* belonging to Mr T. F. Summers and the Turner trophy for the highest pointed fish belonging to a member of the host club was won by Mr P. H. Halliwell with a thick-lip gourami.

Detailed results were:

Tropicals. A.v. platy: 1, Mr B. H. Field; 2, Mr P. H. Halliwell; 3, Mr H. T. Thom-son; 4, Mr Tilbury; 5, Miss L. Stevens. A.v. swordtail: 1, Mr P. H. Halliwell; 2, Mr R. G. Cox; 3, Mr P. Bennet; 4, Mr Chadwick; 5, Mr R. Hatchet. A.o.v. livebearer excepting guppies: 1, Mr H. J. Thomson; 2 and 4, Mr T. J. Summers; 3, Mr D. J. Jones; 5, Mr G. E. Greenhalf.

Characins: 1, Mr R. Cooper (Chatfield trophy for characins); 2, Mr F. D. Hall; 3, Mr R. J. Thorne; 4, Mr L. F. Thorne. A.v. labyrinths (excepting fighters): 1, Mr P. H. Halliwell; 2, Mr A. W. Zurmuhle; 3, Mr T. F. Summer; 4, Mr C. E. Pike. Fighters: 1, Mr C. Jordan; 2, Mr Griffiths; 3, Mr W. R. Sherwin.

Danios, rasboras, minnows: 1, Mr R. J. Thorne; 2, Mr Clayson; 3, Mr D. V. Jones; 4, Mr L. W. Jordan. Barbs: 1, Mrs N. Jordan; 2, Mr R. F. Thorne; 3, Mr F. D. Hall; 4, Mr C. E. Pike; 5, Mr C. Beavis. *Corydoras* catfish: 1, Mr T. J. Summers; 2, Mr C. E. Pike; 3, Mr W. R. Sherwin; 4, Mr B. Pearson; 5, Mr L. W. Jordan. Dwarf cichlids: 1 and 3, Mr E. Sheppard; 2, Mr M. A. Carter; 4, Mr R. J. Thorne; 5, Mr Rutland. O.v. cichlids: 1, Mr D. Cowan; 2, Mrs V. Pike; 3, Mr C. Beavis; 4, Mrs L. J. Thorne; 5, Mr R. F. Thorne.

A.o.v. catfish and loach: 1, Mr G. E. Greenhalf; 2, Mr Pratt; 3, Mr C. Beavis; 4, Master C. Walker. A.o.v. tropical: 1 and 4, Mr P. Ginger; 2, Mr B. H. Field; 3, Mr B. Pearson.

Breeders livebearers: 1, Mr R. S. C. Wingrove (the F.B.A.S. plaque); 2 and 5, Mr R. G. Cox; 3, Mr P. H. Halliwell; 4, Mr Chadwick. Breeders egglayers: 1, Mr R. G. Thomas (The High Wycombe A.S. 1967 Committee Challenge shield); 2, Mr P. Ginger; 3, Mr C. E. Pike; 4, Mr Frost. Breeders pairs: 1, Mr Pratt (the Pengilly trophy); 2, Mr D. V. Jones; 3, Mr C. E. Pike; 4, Mr Hatchet; 5, Mrs Carter.

Coldwater. Common goldfish and Lon-don shubunkin: 1, 2 and 4, Mr R. Bayntun (the Ann Seed Rose Bowl for the best goldfish species); 3, Mr D. V. Jones. Singletails (Bristol shubunkins): 1, 4 and 5, Mr C. Beavis; 2, Mrs A. Seed; 3, Miss M. Sherwin. A.o.v. coldwater fish: 1, Mr W. R. Sherwin; 2 and 4, Mrs A. Seed; 3, Mr Pratt. Breeders class: 1, 2, 3 and 4, Mrs A. Seed.

Furnished aquaria. Club tropical: 1, High Wycombe; 2, South Bucks; 3, Reading. Club coldwater: 1 and 2, High Wycombe. Individual tropical: 1, Mrs P. Bayntun. Individual coldwater: 1, Mrs P. Bayntun. Furnished jars: 1, Mrs G. Cowan; 2, Mrs V. A. Halliwell; 3, Master C. Walker; 4, Mrs N. Jordan. The British furnished aquaria championship was won by Mrs P. Bayntun.

If you combine a love of the simple life with the unenviable job of having to formulate a club show schedule you might just take a leaf out of the book of the Greater Dennis A.S. In one of their fish shows the schedule read: Live-bearers (other than Guppies); Gup-pies; Egglayers (other than Bettas, Characins and Scavengers); Bettas; Characins; Scavengers.

In the Furnished Aquaria Classes were listed: Tank Beautiful—Natu-ral, and Tank Beautiful—Artificial.

Good job that list stops at EIGHT classes. All those characins to sort out and judge in just one class might have tempted any judge to have gone 'one over'!

Huddersfield T.F.S. Show

THE VERY successful 5th open show of the **HUDDERSFIELD T.F.S.** held at the Central Lads Brunswick Club, Queensgate, Hud-dersfield, attracted 316 entries from 26 societies. Mr B. Pengilley of Burnley and Mr F. Cherry of Grassington judged the entries. The best fish in show award went to the arowana belonging to Mr G. Hamnett (Glossop).

Detailed results were:

Swordtail: 1, Mr F. Ledger (Hudders-field); 2, Mrs P. McCourt (Leeds); 3, Mr F. Ledger. Guppies: 1, Mr R. Preston (Belle Vue); 2, Miss C. Brothwood (Leigh); 3, Mr W. J. Orton (Salford). Mollies: 1, Master D. Lacey (Aireborough); 2, Mr J. Whiteley (Aireborough); 3, Mr F. Wood-ward (Blackpool). Platys: 1, Mr S. Scaife (Keighley); 2, Master A. Kaye (Hudders-field); 3, Mr R. Lister (Aireborough).

Small Barbs: 1, Mr W. Booth (T.A.B.); 2, Mr and Mrs J. & H. Dernie (Worksop); 3, Mr G. Horton (Mixenden). Large Barbs: 1, Mr D. Crook (Glossop); 2, Mr D. Ledger (Cornbrook); 3, Mr R. Wilkinson (Halifax). Characins under 3 in.: 1, Mr G. Hamnett (Glossop); 2, Mr P. Bone (Huddersfield); 3, Mr and Mrs J. & H. Dernie (Worksop). Characins over 3 in.: 1, Mrs Anson (F.G.A.); 2, Mr J. Whiteley (Aireborough); 3, Mr B. Winter (Mixenden). Carps and and Minnows: 1, Mr A. B. White (Keighley); 2, Mr C. Green (Thorne); 3, Miss B. Kaye (Huddersfield). Sharks and Flying Foxes: 1, Mr A. B. White (Keighley); 2, Mr R. Wilkinson (Halifax); 3, Mr P. Barritt (Bradford).

Fighters: 1, Mr A. Beasley (Osram); 2, Mr J. Anson (F.G.A.); 3, Mr Whitelock (Tadcaster). Anabantids: 1, Mr Faircliffe (Tadcaster); 2, Mr C. Green (Thorne); 3, Mr Whitelock (Tadcaster). Dwarf Cichlids: 1 and 2, Mr P. Barritt (Bradford);

3, Mr J. Ingram (Glossop). Large Cichlid: 1, Mr D. Crook (Glossop); 2, Mr S. B. Cass (Macclesfield); 3, Mr R. Preston (Belle Vue). Angels: 1 and 2, Mrs Bone, (Huddersfield); 3, Mr A. Hudson (Huddersfield). Toothcarps: 1 and 2, Mr A. Beasley (Oxsan); 3, Mrs Bone (Huddersfield). Small Catfish and Loaches: 1, Mr P. Burritt (Bradford); 2, Mr L. McCourt (Glossop); 3, Mr S. Leedham (Mixenden). Large Catfish and Loaches: 1, Mr W. Booth, (T.A.B.); 2, Mr J. H. Brown, (Mixenden); 3, Mr J. Ingram (Glossop).

Breeders Livebearers: 1, Mr and Mrs J. & H. Dernie (Worksop); 2, Mr T. Cummings (Keighley); 3, Mr W. J. Owen (Salford). Breeders Egglayers: 1, Mr L. McCourt (Glossop); 2 and 3, Mr A. Beasley (Oxsan). Pairs Livebearers: 1, Master A. Kaye, Huddersfield); 2, Mr R. Preston (Belle Vue); 3, Mr W. Booth (T.A.B.). Pairs Egglayer: 1, Mr A. B. White (Keighley); 2, Mr and Mrs J. & H. Dernie, Worksop. 3, Mr L. M. Todd (Independent).

A.o.v.: 1, Mr G. Hamnett (Glossop); 2, Mr J. H. Brown (Mixenden); 3, Mr J. Boswell (Huddersfield). Coldwater: 1, Mr G. Hamnett (Glossop); 2, Mr E. W. Eadon (Sheffield); 3, Miss E. Bone (Huddersfield). Juveniles: 1, Master C. V. Brotherood, 2, Master A. Kaye (Huddersfield); 3, Master A. Robinson (Huddersfield). Ladies: 1, Mrs Preston (Belle Vue); 2, Mrs Burrup (Aireborough); 3, Mrs Whiteley (Aireborough).

Stockport Show

STOCKPORT A.S. held their second annual open show on 17th September, and despite the fact that another major show was held on the same day, attracted entries from as far away as Nottingham. Two unscheduled classes, for furnished tanks and pairs, had to be included. A pleasant day enabled refreshments to be served in marquees and also made a great success of a sideshow in the which competitors had to run a wire loop along a fixed length of bent wire without letting either touch the other—if contact was made an electric bell rang.

The show was judged by Mr L. McCourt and Mr G. R. Collins. Detailed results were:

Guppies: 1, Mr E. Price; 2, Miss C. Brotherood; 3, Messrs. Duffy and Beardshall. Mollies: 1, Mr W. Berning; 2, Mr Woodward; 3, Mr D. Crook. Platies: 1, Mrs M. Crook; 2, Mr A. Middleton; 3, Mr A. Gardner. Swordtails: 1, Mr W. Berning; 2, Mrs M. Crook; 3, Mr Woodward. A.o.v. livebearer: 1, Mr J. Hillary; 2, Mr H. Pearson; 3, Mr D. Slater.

Small barbs: 1 and 2, Mr D. Thornalls; 3, Mr B. Beswick. Large barbs: 1 and 2, Mr K. Parkes. Danios etc.: 1, Mr R. Moorcroft; 2, Mr K. Parkes; 3, Mr D. Thornalls. Sharks and loaches: 1, Mr G. Kershaw; 2, Mr D. P. Johnson; 3, Mrs J. Woodward. *Hemigrammus* etc: 1, Mr and Mrs Charlton; 2, Miss B. Kaye; 3, Mr Woodward. A.o.v. small characin: 1, Mr D. P. Johnson; 2, Mr F. Mulla; 3, Mr and Mrs Charlton. A.o.v. large characin: 1, Mr D. Thornalls; 2, Mr R. Moorcroft; 3, Mr E. Price.

Fighters: 1, Mr Woodward; 2, Mr B. Beswick. Small anabantids: 1, Mr E. Price; 2, Mr G. Kershaw; 3, Mr G. Hodgkinson. Large anabantids: 1, Mr F. Mulla; 2, Mr E. Greenwood; 3, Mr F. Mulla. Angel fish: 1, Stockport show team; 2, Mr Woodward; 3, Mr R. Tomkinson. Dwarf cichlids: 1, Mr R. Seabright; 2, Mr W. Smith; 3, Mr E. Fletcher. Large

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Welsh Aquarists Boost Hobby

MONMOUTHSHIRE once again became the focal point for Welsh and western region aquarists on Saturday, 16th September, when **NEWPORT A.S.** held its annual open show. The number of entries this year exceeded the 1966 record-breaking total by 75.

Several unusual fishes were to be seen at the show, a *Pseudotropheus* taking first prize in the dwarf cichlid class (and best fish in the show award), an exceptionally nice *Abramites* and a piranha also worthy of mention—in fact we have it on good authority that the report of the show appearing in the South Wales Argus was to be headed 'Man-eater at Stow Hill School'. Fewer people attended the show this year, but the loss on the door was amply made up for by sale of an excellent range of snacks and light refreshments made available by the ladies of the society.

Two stands were to be seen at the show, one from the South Wales Aquaria Ltd. of Cardiff, who had on display two exceptionally fine specimens of the fire eel and an extremely nice *Geophagus*. Mr Barry Light, on the stand, told PFM reporter that he had made a special journey to London a few days before the show to obtain some fish for his stand.

On the other, put up by the International Marine Study Society, were quite a variety of tropical and native marine fishes including a nice *Chelmon rostratus* owned by Mr Derek Bevan of Swansea, with general information for anyone considering setting up a marine tank.

The society was unable to produce its usual printed programme this year, but even without this it was an excellent show and the show committee, under the guidance of show secretary Mr Michael Parry, could congratulate themselves on the results.

The prizes were presented by Mrs Pocock, wife of Mr A. Pocock of Newport. Judges were Mr B. R. James (Cheltenham), Mr G. H. Jennings (I.M.S.S.), Mr J. Sanders (Bridgend), Mr B. Light and Mr I. Ibbotsen (Barry). Mr C. Barber of Bridgend A.S. won the award for the highest aggregate of points in the show and for the best fish in the show. The best coldwater fish was owned by Mr P Player (Barry A.S.). Master D. Smithson won an award for the best exhibit by a junior and Mr T. R. Hall (I.M.S.S.) that for the best native marine exhibit in the show. The best tropical marine exhibit award went to Mr D. Bevan (I.M.S.S.), the best furnished aquaria award to Mr F. G. James (Newport) and the best breeders' team to Mr J. R. Wheeler of Trowbridge.

Detailed results were:

Siamese fighting fish: 1, Mr T. G. Wall (Newport); 2, Mr W. D. Songhurst (Llantwit Major); 3, Mr W. Smithson (Bridgend). Anabantids: 1, Mr J. R. Wheeler (Trowbridge); 2, Mr G. R. Pearce (Bridgend); 3, Mr A. Harding. Barbs: 1, Mr G. Pearce (Bridgend); 2, Mr F. G. James (Newport); 3, Mr W. Chapman (Newport). *Hemigrammus* and *Hyphessobrycon*: 1, Mr W. Chapman (Newport); 2, Mr P. Parsons (Cardiff); 3, Mr C. Barber (Bridgend). A.o.v. characin: 1, Mr C. Gorwill (Cardiff); 2, Mr A. Rogers (Llantwit Major); 3, Mr W. Songhurst (Llantwit Major).

Dwarf cichlids: 1, 2 and 3, Mr C. Barber (Bridgend). A.o.v. cichlid: 1 and 2, Mr W. Gorwill (Cardiff); 3, Mr P. Parsons (Cardiff). *Corydoras*: 1, Mr G. P. Pearce (Bridgend); 2, Mr J. Wheeler (Trowbridge); 3, Mr W. Songhurst (Llantwit Major). A.o.v. catfish: 1, 2 and 3, Mr W. Gorwill (Cardiff). Danios, rasboras and minnows: 1, Mr P. Parsons (Cardiff); 2, Mr J. Lowndes (Newport); 3, Mr A. Warmsley (Cardiff). A.o.v. egglayers: 1, Mr P. Player (Barry); 2, Mr W. Gorwill (Cardiff); 3, Mr I. Phillips (Newport).

Swordtails: 1 and 3, Mr T. G. Wall (Newport); 2, Mr W. Chapman (Newport). Platys: 1, Mr A. Rogers (Llantwit Major); 2 and 3, Mr R. S. Wigg (Llantwit Major). Mollies: 1, Mr C. Barber (Bridgend); 2 and 3, Mr W. Smithson (Bridgend). Guppies (F.G.B.S.): 1, Mr R. S. Wigg (Llantwit Major); Joint 2, Mr R. S. Wigg and Mr H. R. Wheeler (Trowbridge). Guppies (F.G.A.): 1, Mr C. Barber (Bridgend); 2 and 3, Mr P. Tidball (Newport).

Breeders' livebearers: 1 and 2, Mr J. R. Wheeler (Trowbridge); 3, Mr R. S. Wigg (Llantwit). Breeders' egglayers: 1, Mr J. R. Wheeler (Trowbridge); 2, Mr E. Myer (Newport); 3, Mr W. Gadd.

A.v. goldfish: 1, 2 and 3, Mr B. A. Harding. A.o.v. coldwater: 1, 2 and 3, Mr P. Player (Barry). A.v. native marine fish: 1 and 3, Mr T. R. Hall (I.M.S.S.); 2, Mr P. Parsons (Cardiff). A.v. tropical marine: 1 and 2, Mr D. Bevan; 3, Mr R. Ferrari (Llantwit Major).

Junior class, a.v. livebearers 1, Master P. Wheeler (Trowbridge); 2, Master C. Pemberton (Newport); 3, Master D. Smithson (Bridgend). Junior class, a.v. egglayers: 1, Master D. Smithson (Bridgend); 2, Master P. Wheeler (Trowbridge); 3, Master N. John (Newport). Furnished aquaria: 1, Mr F. G. James (Newport); 2, Mr C. Barber (Bridgend); 3, Mr L. Barrowman (Newport).

Club News

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cichlids: 1, Mr D. Crook; 2, Mr F. Mulla; 3, Mr Moorcroft.
Characins: 1, Mr E. Fletcher; 2, Mr G. Rawlins; 3, Mr R. Brotherwood. A.o.v. catfish: 1, Mr F. Mulla; 2, Mr C. V. Brotherwood; 3, Mr E. Price. Loaches: 1, Mr J. Hillary; 2, Mr A. Gardner; 3, Mr G. Hodgkinson. Toothcarps: 1, Mr and Mrs Charlton; 2, Mr A. Newall; 3, Mr D. P. Jackson. Breeders egglayers: 1, 2 and 3, Mr and Mrs Charlton. Breeders livebearers: 1, Messrs Duffy and Beardshall; 2, Mr J. Hill; 3, Mr W. Berning.
A.o.v. tropical: 1, Stockport show team; 2, Mr R. Phillips. Fancy goldfish: 1, Mr Eaden; 2, Mr G. Hanworth; 3, Mr W. Berning. A.o.v. coldwater: 1, Mr Eaden; 2, Miss C. Brotherwood; 3, Mr J. Hillary. Mini-tank: 1, Mr and Mrs Charlton; 2, Miss M. Kaye; 3, Mr B. Jones.
The award for the best fish in show was won by Mr E. Price of Gorton & Openshaw A.S. Stockport A.C. regained their own trophy for the club gaining most points. Moorside A.S. came second and Gorton & Openshaw A.S. came third.

THEIR TWO-DAY eighth annual show and exhibition of tropical fish was put on by OSRAM A.S. in a hall that had been delightfully decorated with exotic plants by the well-known horticulturist, Mr J. Pimbell. The judging was carried out by Mr Collins, Mr Moorhouse and Mr L. Baxter, and from over 200 exhibits the following awards were made: the best fish on show was judged to be the calico fantail belonging to Mr S. Walsh of Blackburn; the best tropical exhibit was Mr Taylor's snakehead and the Norman Wright Achievement trophy was won for the second time by Mr F. Gregory, who also won the competition for the best home furnished aquaria. Mr L. Fawkes, Osram Divisional Manager, distributed the following prizes:

Furnished aquaria: 1, Mr H. Penhall (Osram); 2, Mr K. Ashworth (Osram); 3, Mr J. E. Shore (Osram). Anabantids: 1, Mr W. Parkin (T.A.B.); 2, Mr G. Kershaw (Heywood); 3, Mr K. Hill (Heywood). Fighters: 1, Mr T. Sutton (Osram); 2 and 3, Mr A. Beasley (Osram). Small barbs: 1, Mr F. Gregory (Osram); 2, Mr J. Fogson (Osram); 3, Mr K. Hill (Heywood). Large barbs: 1, Mr W. Parkin (T.A.B.); 2, Mr T. Harris (Heywood); 3, Mr F. Partington (Osram). Labeos and sharks: 1, Mr G. Kershaw (Heywood); 2, Miss J. D. Shore (Osram); 3, Mr J. Ogden (T.A.B.).
Small characins: 1, Mr J. E. Shore (Osram); 2, Mr K. Wilbraham (Osram); 3, Mr W. Parkin (T.A.B.). Medium characins: 1, Mr W. Parkin (T.A.B.); 2, Mr J. E. Shore (Osram); 3, Mr T. Sutton (Osram). Large characins: 1, Mr W. Parkin (T.A.B.). Rasboras: 1, Mr G. Kershaw (Heywood); 2, Mr A. E. Mackey (Osram); 3, Mr F. Gregory (Osram). Danios: 1, Mr K. Ashworth (Osram); 2, Mr J. Hayes (Heywood); 3, Mr A. Beasley (Osram).
Dwarf cichlids: 1, Mr F. Gregory (Osram). Large cichlids: 1, Mr W. Taylor (Osram); 2, Mr Gardner (Heywood); 3, Mr M. Jones (Valley). Angels: 1, Mr M. Taylor (Osram); 2 and 3, Mr E. Eastwood (Osram).
Loaches: 1, Mr W. Taylor (Osram); 2, Mr J. Butterworth (Valley); 3, Mr J. E. Shore (Osram). Toothcarps: 1 and 2, Mr A. Beasley (Osram); 3, Mr J. E. Shore (Osram). Catfish: 1, Mr W. Parkin (T.A.B.); 2, Mr A. E. Mackey (Osram); 3, Mr J. E. Shore (Osram).
Swordtails: 1, Mr K. Hill (Heywood); 2, Mr J. E. Shore (Osram); 3, Mr W. Parkin (T.A.B.). Mollies: 1, Mr W. Parkin (T.A.B.); 2, Mr A. Beasley (Osram); 3, Mr G. Platt (Osram). Platys: 1, Mr J. E. Shore (Osram); 2, Mr A. Beasley (Osram); 3, Mr Gardner (Heywood). Guppies: 1, Mr W. Parkin (T.A.B.); 2, Mr J. Baron (F.G.A.); 3, Mr B. Preston (F.G.A.).
Breeders egglayers: 1, Mr J. E. Shore (Osram); 2, Mr K. Wilbraham (Osram); 3, Mr W. Taylor (Osram). Breeders livebearers: 1, Mr A. Beasley (Osram); 2, Mr J. E. Shore (Osram). Breeders guppies: 1, Mr B. Preston (F.G.A.); 2, Mr A. Beasley (Osram); 3, Mr J. Baron (F.G.A.). A.o.v.: 1, Mr W. Taylor (Osram); 2, Mr W. Parkin (T.A.B.); 3, Mr R. Johnson (Heywood). Pairs egglayers: 1, Mr W. Parkin (T.A.B.); 2, Mr J. Fogson (Osram); 3, Mr A. Beasley (Osram). Pairs livebearers: 1, Mr J. E. Shore (Osram); 2 and 3, Mr A. Beasley (Osram).
Osram juniors: 1, E. Jones; 2, E. Jones and D. Langfield; 3, I. Bolton and T. Sutton. Goldfish: 1, Mr J. Butterworth (Valley); 2, Mr Milloy (Middleton); 3, Mr M. Jones (Valley); Shubunkins: 1, Mr S. Walsh (Accrington); 2 and 3, Mr R. Birch (Heywood). Veiltails: 1, Mr S. Walsh (Accrington); 2, Mr A. Phillipson (East Lancs); 3, Mr R. Birch (Heywood). Orandas and lionheads: 1 and 2, Mr A. Phillipson (East Lancs); 3, Mr R. Birch (Heywood). Black moors: 1, Mr A. Phillipson (East Lancs); 2, Mr S. Walsh (Accrington).

MARINE FORUM

I.M.S.S. News

THE **INTERNATIONAL MARINE STUDY SOCIETY** have been enjoying a very busy season and seem to be continually popping up with displays and talks. Successful displays were mounted by the club at both the National open show and the Newport open show recently and I.M.S.S. members are booked to give seven talks, in addition to the five already given in their 'expenses only' lecture series.

An outing to Ovingdean in Sussex proved to be a very pleasant occasion and although it fell during the holiday season the members who were able to be present succeeded in capturing 29 fishes, including sand smelts (*Atherina presbyter*) and black gobies (*Gobius niger*) besides two unidentifiable young wrasse.

Another informal visit by officers of the society to Shoeburyness in Essex resulted in a catch of well over 300 fishes within two to three hours. These consisted mainly of *Gobius minutus*.

Anyone wanting further information on any of the I.M.S.S. services, affiliation or ordinary membership should contact either the membership secretary, Mr Keith Martin, 158 Oxford Road, Swindon, Wilts, or the general secretary, Mr T. R. Hall, 23 Canfield Gardens, London, N.W.6.

Copper and Marines

What is the correct dosage to be used when administering copper sulphate as a remedy for marine fish diseases?

There are several well-tried and proven methods of preparing a stock solution of copper sulphate to treat your marines, and we have found that the addition of 7·4 milligrams of chemically pure copper sulphate for every gallon works effectively. If desired, you may make up this copper salt as a stock solution before use, since it does not deteriorate on storage, and use the correct volume of this solution each time. A pre-packed copper sulphate remedy is now also available from most marine stockists.

In Brief . . .

. . . NEW **FANCY GUPPY ASSOCIATION** SECTION in West London. A West London section of the Fancy Guppy Association has been formed and will meet at the Community Centre, Clifton Road (opposite the Fire Station), Isleworth on the third Sunday in each month. Details from secretary Mr M. Richardson, 20 Maylands Drive, Uxbridge, Middlesex or chairman Mr John Thorne, 108 the Grove, Isleworth (phone 01–568–0727). It is hoped to make this a real family club with a friendly, enjoyable atmosphere and visitors, wives and children are all welcome to join in and learn about guppies and their wonderful colours and fin shapes.

. . . THE SOCIETY LIFE that was the theme of Mr P. Reynolds' interesting talk to members of **PONTEFRACT & D. A.S.** did not refer to the activities of the jet-set but to the details of club life in the fishkeeping world and of the showing of fishes. At the table show, the first winner of the trophy for the best exhibit, donated by Mr J. Thompson, was Mr D. Hodgkiss with a red-fin tetra.

. . . MR D. SONGHURST was elected chairman at the annual general meeting of **LLANTWIT MAJOR A.S.**; vice-chairman, Mr K. Farrant; secretary and treasurer, Mr R. Wigg (17 Ham Lane South, Llantwit Major); show secretary, Mr J. Sanders; librarian, Mrs G. Pearse.

A progress report by Mr K. Farrant on his tropical marine tank after it had been set up for 3 months proved very interesting to club members. At the September meeting Mr C. Lewis from Gosport judged the table show. The best fish in show award went to the *Platy variatus* of Mr Allen Rogers. Breeders egglayers: 1, Mr A. Ibbertson. Breeders livebearers: 1 and 2, Mr R. Wigg; 3, Mr A. Ibbertson. Single fish a.v. egglayers: 1, Mr J. Sanders; 2, Mr A. Ibbertson; 3, Mr A. Rogers. Single fish a.v. livebearers: 1, Mr A. Rogers; 2, and 3, Mr A. Ibbertson.

. . . CHANGE OF VENUE for the EDMONTON SECTION of the **FANCY GUPPY ASSOCIATION.** The section now meet at 3, River Walk, Enfield (opposite Enfield Town station) at 3.0 p.m. on the first Sunday in each month.

. . . NEW SECRETARY of the **SOUTH PARK AQUATIC (STUDY) SOCIETY** is Mr F. G. Glynn (64 Beclands Road, Tooting, London, S.W.17; phone 672.0485).

. . . MEMBERS of **AIREBOROUGH & D. A.S.** left the Seaham Harbour A.S. open show with the award for the club gaining the highest number of points with its exhibits. The club has also recently been presented with an Award Cup by Alderman W. Hudson for use at its own open show. The September meeting saw a good attendance of 47 for the auction of fishes, plants and equipment. Table show award winners were: novice: 1 and 2, Mr Naylor; 3, Mr Cory. Specified: 1 and 3, Mr P. Iveson; 2, Mr Whiteley. A.o.v.: 1, Mr Lister; 2, Mr Whiteley; 3, Master D. Lacey.

Badge of the Month

Hendon & District Aquatic Society

. . . A CHANGE of secretary has taken place in **HALTON & D. A.S.** New Secretary is Mr D. Hynes, 18 Willow Crescent, Halton, Leeds.

. . . VISITORS are invited to attend the November meeting of **ENFIELD & D. A.S.** when an auction of fish, plants and equipment will be held. One very welcome visitor already has been Mr E. Leadley of Stone A.S. and member of the B.K.A., who hopes to attend one more meeting while 'down south'. Results of the September table show were: breeding pairs: 1, Mr T. Mann (Madagascar rainbows); 2 and 3, Mr J. Whittackel (hatchets and marigold platys).

. . . SECRETARY of **WORCESTER A.S.**, Mr L. Cottam, has changed his address to 13 Cottage Lane, Marlbrook, Bromsgrove, Worcs. The club venue has also changed to a new and larger H.Q. at the Congregational Church Hall, Angel Place, Worcester. A cordial invitation is extended to any person interested in joining.

. . . RESULTS of the season's first **MIDLAND AQUARIST LEAGUE** show held at Rugby were: Cichlids: 1, Mr A. L. Trotman (Atherstone); 2, Mr E. J. Sheehy (Coventry); 3, Mr T. H. Coombes (Bedworth). Anabantids: 1, Mr and Mrs D. T. Delves (Bedworth); 2, Mr D. Green (Rugby); 3, Mr A. L. Trotman (Atherstone). Breeders egglayers: 1, Mr R. Fox (Rugby); 2, Mr A. L. Trotman (Atherstone); 3, Mr T. Grant (Coventry). Best fish in show award went to Mr R. Fox of Rugby.

. . . **DUDLEY & D. A.S.** have been enjoying a variety of activities including a conducted tour of Dudley Zoo grounds and inmates and have acted as hosts to Worcester A.S. Results of the table show were: Anabantids, experienced (3 entries): 1, 2 and 3, Mrs Croft. Anabantids, novice (28 entries): 1, Mr B. Oakley; 2, Mrs G. Smith; 3, Mr Gregory; 4, Mr B. Jukes. Plants, novice: 1, Mr P. Birch. Mr E. Morse, editor of the club's newsletter, plaintively queries what has happened to the fish of all the experienced members?

. . . RESULTS OF THE garden pool competition held by members of the **COVENTRY POOL & AQUARIUM SOCIETY,** judged by Mr E. Leggett and Mr L. Dodge, were: 1, Mr Hancox; 2, Mr Bromfield; 3, Mr Randall; 4, Mrs Manning; 5, Mr Handford. Club members have been very sad to learn of the death of Mr C. A. Essam, one of the society's vice-presidents, who had been associated with the club for many years and held a number of offices including the chairmanship.

. . . MEMBERS of **YORK & D. A.S.** have been happily airing their views recently in a series of debates held at club meetings. Large attendances produced lively discussion. The motion that 'In the interest of the hobby an aquarist society is necessary' was carried by 38 votes to 1 and the motion 'That under-gravel filters are all that the makers claim' heavily defeated. The results of the other debates on the advantage on

snails in the aquarium, the value of fluorescent lighting and the question of overfeeding were, however, much more closely contested and showed clearly once again how seldom there is an absolute solution to any problem in the fishkeeping hobby.

. . . BECAUSE of pressures of work, Mr Tom Wayles has had to relinquish full responsibility for the monthly issue of the Mersey Beacon, the **MERSEYSIDE A.S.** journal. This has been taken over by the committee under the guidance of librarian, Mrs Vera Parkes.

. . . THE OFFICERS and committee of the **FREELANCE A.S.** newly elected or confirmed in office at their recent annual general meeting, are: chairman, Mr R. Wilkins; vice chairman, Mr T. Ravensdale; secretary, Mr B. Pearson (56 Bramwell House, Harper Road, London, S.E.1); treasurer, Mr R. A. Thomas; show secretary, Mr A. Howes (26 Rubens Street, Catford, London, S.E.6); committee members, Mr P. Durham and Mr F. Kendrick.

. . . HALIFAX A.S. are holding their sixth open table show on the 12th November (see Dates for Your Diary for details).

. . . GUESTS from other societies joined **PORTSMOUTH A.S.** members when Mr Adrian Nyoka, expert on reptiles and a wild animal trainer, lectured to the club recently. Mr Nyoka is well known for his appearances with his animals on T.V. and in films, and among the live specimens he took to the lecture was an 18 in. Indian python, a 9 in. anaconda, and a mangrove. Another lecture given recently to the club was Mr S. D. Forse on the breeding of tropical fish. Results of the table show at this meeting were: twintails: 1, Mr P. Wyllie; 2, Mr H. Hancock; 3, Mr E. Binstead. River and pond: 1, Mr E. Binstead; 2 and 3, Mr V. Hunt.

. . . RESULTS OF **LEAMINGTON & D. A.S.** table show for novices' egglayers and livebearers were: egglayers: 1, Mr J. Morris; 2 and 3, Mr Chamberlain; 4, Mrs S. D. Underwood. Livebearers: 1 and 3, Mrs S. D. Underwood; 2, Mr M. Smith; 4, Mrs Chamberlain. Open class, pairs egglayers: 1, Mr F. Underwood; 2, Mrs C. Beard; 3 and 4, Mrs J. Smith.

Dates for Your Diary

28th–29th October. **BRITISH AQUARISTS FESTIVAL** organised by the Federation of Northern Aquarium Societies, Belle Vue Zoological Gardens, Manchester.

29th October. **SOUTH LONDON FANCY GUPPY ASSOCIATION** annual Show. Benching 1–3.30 p.m. at Ladiegonn House, Hawkes Stone (off Surrey Dock). Non-members' class included.

11th November. **GOLDFISH SOCIETY OF GREAT BRITAIN** quarterly assembly.

11th November. **HENDON & D.A.S.** Congress. Whitfield Secondary Modern School, Claremont Road, Hendon, London, N.W.2. Starts at 6.0 p.m. Speaker Colonel Jorgen Scheel.

12th November, **HALIFAX A.S.** 6th open Table Show. Canteen of Smith Bulmer & Co. Ltd., Holmfield Mills, Halifax.

19th November. **ASSOCIATION OF MANCHESTER & DISTRICT AQUARIST SOCIETIES** Open Show.

19th November. **DEWSBURY & D. A.S.** annual Open Show. Further Education Centre, Park Road, Batley. (17 classes, 4 judges).

26th November. **LEEDS & D.A.S.** Open Day Show. (Change of date).

2nd December. **FEDERATION OF BRITISH AQUATIC SOCIETIES** Assembly.

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Continued on page 334

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.. .. small	2 3
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