

SEPTEMBER 1974

20p

Pet **Fish**

# PRACTICAL FISHKEEPING MONTHLY



**Contents include:**

Red-Spotted Panchax

Coldwater Scene

Aquarium Heating Economies

Lighting Marine Aquaria

Neon Gobies on the Reef

Breeding the Scissortail

Fluorescent Light and Eggs

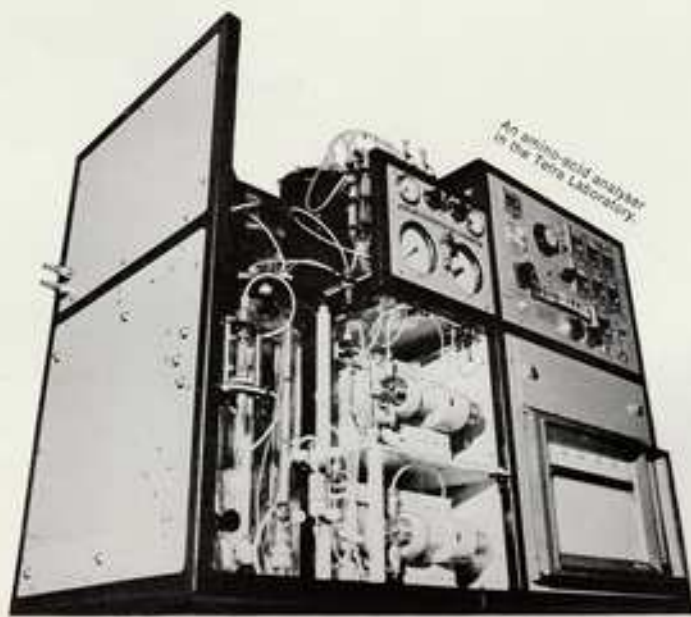
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G. Bellenger

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## Comments and Quotes

### An Aquarium Anniversary

THIS year is the centenary of the opening to the public of the Manchester Aquarium. Although it was not the first public aquarium in England (London's Zoo Aquarium opened in 1853), and not of the size of the famous Brighton Aquarium (1872), it was probably the largest inland public aquarium anywhere in 1874. In the same year the Southport Aquarium opened on the coast not 40 miles away, and even then at a not much greater distance from Manchester, farther north the Blackpool Aquarium could be visited. This is how an author described the Manchester Aquarium in 1876:

"The main portion of the building occupies a superficial rectangular area of 150 feet in length, by 72 in breadth. At each extremity of the saloon are placed the two largest tanks. These occupy the entire width of the room 40 feet; so that they are capacious enough to contain living animals of considerable size. The total number of tanks at present existing is sixty-eight. These have a linear frontage of nearly 700 feet, which approaches very nearly the total frontage of the Brighton tanks. It is contemplated adding a series of tanks between the arches separating the saloon from the corridors so as to raise the total number to one hundred. This would give an additional frontage of 224 feet, and so far would render the Manchester Aquarium the most extensive in this respect."

The 'linear frontage' of Southport's tanks at the 'Winter Garden' was 500 feet. The nineteenth century author goes on: 'Other aquaria are in course of erection at Scarborough, Yarmouth, and elsewhere . . . The extensive aquarium at Westminster is in connection with a "winter garden". Although opened to the public the tanks are not yet fully stocked. The show tanks will hold 150,000 gallons of water, whilst there are storage reservoirs underneath capable of

holding 600,000 gallons more. Public aquaria are further either being built or contemplated at Rhyd, Rotheray, Plymouth, Torquay, Southsea, Tynemouth, Margate, Scarborough, Ipswich, and elsewhere . . ."

These aquariums either never materialised or, like many great ones of the period, soon closed their doors. They were neither financially nor functionally successful, but to the home aquarium-keeper 100 years later their interest is an evidence for the burgeoning of public enthusiasm for the aquarium at that time, an enthusiasm to which the aquarium-keeping hobby as we know it must surely owe its origin.

### Intensive Fish Culture

A FISH farming system that is claimed to deliver correctly oxygenated and turbulent water to fish is patented by the Marine Protein International Corporation in RP 1 351 519. The level of oxygen in fish tanks is critical in determining the rate of growth and the maximum density of the fish. If oxygen is simply bubbled through the tank, much of the oxygen travels through the water in bubbles, without dissolving, and is lost to the atmosphere. In the new system, the oxygen dissolved in the tank water is maintained as closely as possible to saturation level.

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Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London SW17 0NY

#### Ready Buyers

I WAS very interested in the remarks made by Mr Hall about the poor deal given at present by shops to private breeders of fish (PFM Letters, July) and, knowing a bit about the organisation 'behind the scenes', I think that if imports become difficult shops will not only be more willing to take fish from private breeders but more able to. Conscientious traders who quarantine their fish often just haven't got tank space to take 20 or so guppies when their quarantine tanks were filled up the day before, or just about to be filled up with a complete load of fish from a wholesaler. Those traders who don't use a quarantine system don't always want to take a few recognisable fish that will be seen to be on sale at once. If fish aren't so easy to come by then there will be more empty tanks available for storing. Also, without wishing to start up the old arguments between private breeders and traders, I think fishkeepers have got to realise that traders will probably never welcome the person who expects them to take half-a-dozen very indifferent guppies or a few minute platys on the odd occasion. 'Private breeders' are those people who are breeding fish seriously, probably with a fish house available, who can guarantee a steady stream of reasonable sized youngsters. Such people are very few and far between at present.

London, SW27

J. KEEN

IT has often occurred to me that there would be a lot of advantage of having some kind of fish breeders' register, giving names of serious home breeders of particular species or varieties, and the remarks in 'Comments and Quotes' on the subject of home-bred stocks makes me think that the requirement for such a 'register' is now here. The list would enable anyone in a given area who was planning to produce some fish to see if this or that species was already plentifully available, or could be used by other specialists looking for sources of good home-bred breeder fish. Perhaps PFM would consider collecting together records of this kind from readers for publication or to be supplied to readers on application? I would be interested to know other readers' opinions about this.

Edinburgh

K. PALMERS

*To some extent the specialist fish societies can help with this kind of information although we know that*

*a number of specialist breeders are not society members and, of course, for many fishes there are no 'specialist' groups. We too look forward to receiving comments from readers on the creation of a Breeders' Register—EDITOR.*

I WOULD like to add my support to Mr G. R. Hall's letter (PFM Letters, July). I think that, discounting the eventual cost of imported tropical fish, retailers and aquarists should get together so as to create an outlet for the aquarist's surplus stock. This would help a great deal towards keeping the cost of tropical fish down, thus creating a ready market for the aquarist to dispose of their fry other than feeding them to their prize fish. As with everything today, the cost is steadily increasing and tropical fish are no exception. Reading your Comment 'Imported Fishes', I notice that you say that it is possible that the aquarist who can breed one, two or three species in regular quantities may find in the near future that it may be economically worthwhile to dispose of the fry through the trade; it will be both financially rewarding and a valuable contribution to the hobby. At the moment my main interest is keeping the discus, but because of the so-called difficulty surrounding these fish and their upkeep there does not seem to be a very great demand for them. I also notice that there is not a great demand for the fry of the larger cichlids, e.g. jewels, severum, blue acaras etc. I wonder if this will reverse in the near future. I find these fish the most interesting of all aquarium fish, especially for intelligence and parental care. Any suggestions?

Morrison, Swansea

A. J. C. CHATTERTON

#### Set a Thief...

MY father has a large pond in his garden and was troubled with herons taking his fish early this year. There is an ornithologist in the village so he was asked if he could stop the birds taking the fish. The first idea was to put a wire round the pond 10 inches from the ground and close enough so that the bird couldn't land between wire and pond edge. The second idea was to buy one of the plastic storks on sale at garden centres and paint it a light grey, then stand it near the

*Continued on page 222*

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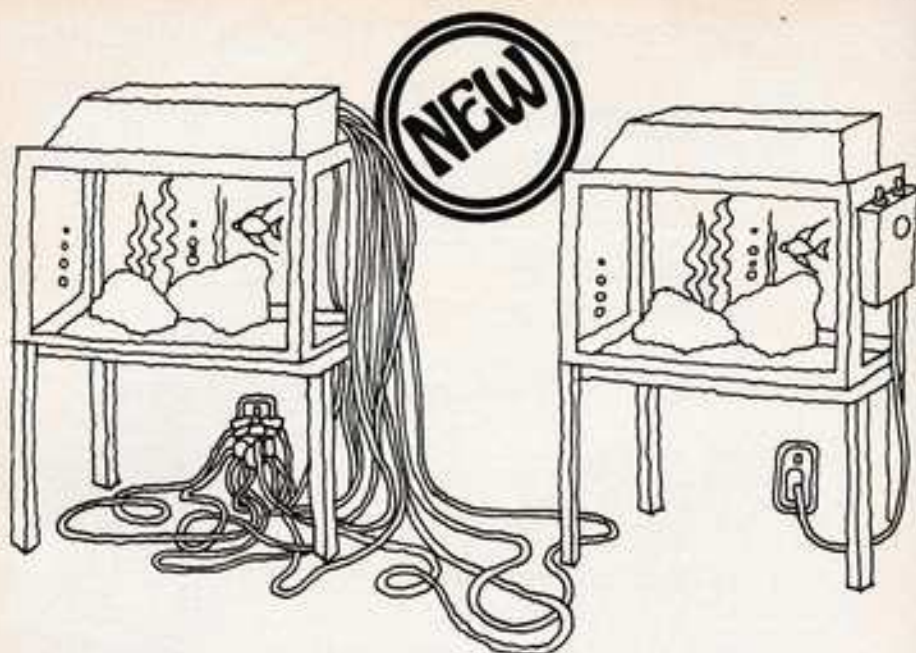
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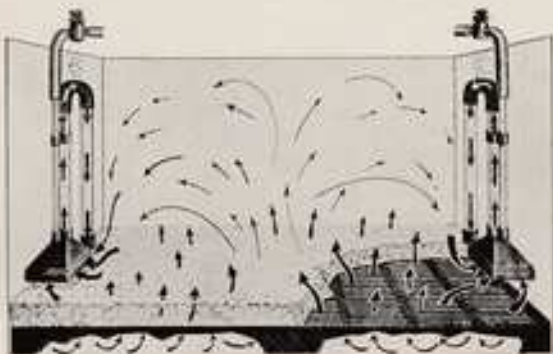
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## Breeding the SCISSORTAIL



Pair of scissortails (*Rasbora trilineata*): the female is the lower fish

I HAVE often remarked before that aquarists seem so often to keep only the same old fish in their tanks. Why is this, I wonder? Is it due to conservatism or lethargy? Or do fishkeepers only enjoy watching red fish? I really can't understand it. I myself, concerned as I am with fish breeding and their propagation, am really interested in a species only until I succeed in breeding it. When I have accomplished this, I turn to another species. To this day, if I am invited to visit an aquarist, I am always curious to see if he has something new swimming about in his tank. And more often than not I am disappointed. It's always *Xiphophorus*, the better known characins and barbs. But now and then I've had the luck to obtain a fish this way that I haven't been able to get from the dealers. Such a fish is the scissortail.

By RUDOLPH ZUKAL

Photograph by the author

Translated by F. MARSH

It grows to about 3 in. (8 cm.), and has an elongated, slim and transparent body. The tail is large and deeply forked. The back is dark olive green with a black border. The silvery sides have a rainbow gleam and the belly is whitish. From the

gills a dark horizontal band stretches right across the dark patch round the caudal peduncle to the middle of the caudal fin. The whitish caudal has at the end of each lobe a heavy black fleck that makes a beautiful design of three separate bands, white, black and white again. Sex distinction relies on body shape—the male is slimmer and quite a bit smaller than the fuller-bodied female.

Scissortails were imported into Europe from the Malay peninsula, Sumatra and Borneo and although they are relatively easy to breed they are, in my part of the world, among the rarer aquarium fishes. They are eminently suitable for a community of peaceful fishes in a large, 36 in. or longer tank (100 litres). They move in a shoal and are reminiscent of danios in their behaviour pattern. They are quite at home in a lower temperature range of 68–72°F (20–22°C) in normal tap water. A well-planted, well-lit tank is ideal for them. They are omnivorous and eat all types of food, dried and live.

For breeding purposes you need well developed and well fed fish, preferably two males to one female. The tank temperature must be raised to 79°F (26°C) and the water should not be hard. A rectangular aquarium is the most suitable for the

purpose with enough small stones to cover the bottom. This is to hide the eggs from the voracious parents. A quantity of fine-leaved plants should also be placed in the tank. The parent fish don't pay much attention to the eggs while they are spawning but they certainly will afterwards.

Spawning will take place very quickly if the fish are brought from a lower to a higher temperature, and they mostly spawn early in the day. The eggs are relatively large. The brood hatches after 36 hours and the fry are free-swimming on the sixth or seventh day, when they are ready for their first live food. It doesn't have to be live food—they will quite happily take dried food. Spawning can be repeated several times a year.

These fish should undoubtedly be kept and bred more by fish hobbyists. Unfortunately they share the fate of many other peaceful fishes that are only 'silvery' in colour. And that is not right. My father always used to say to me: 'Every single person, in his own way, is a mixture of both shrewdness and foolishness. No individual should ever be underestimated.' I think this should be applied to fish as well. Each species of fish has its own beauty when looked at with a knowledgeable eye.

## LETTERS

*continued from page 214*

pond. The reason for this is that the heron is a lone feeder and will not come next to another bird to feed. These ideas have been tried and we haven't lost any more fish since the first visits, and we have been able to re-stock the pond. I hope these ideas may be of use to fellow pondkeepers.  
Northolt, Middx.

J. PARKER

*AN excellent editorial in the publication of the AQUARIUM SOCIETY OF VICTORIA, FINCHAY, pinpoints the curious situation where too great a turnover of fishkeepers is bad for the hobby. The author writes: 'The fishkeeping world is one of constant enigma. Never has Melbourne been so blessed with aquarium clubs and never have so*

*many been involved in fishkeeping, whether hobbyist, shopkeeper or just dabbler. Despite this fact never has it been so difficult to obtain knowledgeable lecturers, writers of articles or even people with any depth of experience with whom to converse... Whilst new members are the life blood of any society the dangers associated with becoming schools rather than*

*societies are becoming obvious to all who participate actively in any club, whether specialist or general. The administration and lecturing loads are being borne by fewer and fewer and the fruits of their labours are being spread wider and wider. The need is for more aquarists and fewer fishkeepers. Let's hope this situation comes about before it's too late.'*

### A Record?

I WISH to put forward a claim for the record number of live young produced by an ovoviviparous fish. The fish in question were a pair of tuxedo swords. The female was placed in an 18 in. by 10 in. by 10 in. nursery tank on 26th July and on the 28th July 302 living young were produced. During the following 24 hours a total of 114 of the fry died; these appeared to be mainly red-eyed red and normal red young. The 'birth' was witnessed by my wife and me and the count was verified by Mr A. Moore, treasurer of Basford & District Aquarist Society.

G. A. GUEST

(Manager), Pisces Tropicals,  
Vernon Road, Old Basford,  
Nottingham



# Fluorescent Lighting and the Hatching of Fish Eggs

By R. A. WEIR

Ontario Ministry of Natural Resources, Ontario, Canada

& R. W. McCAULEY

Waterloo Lutheran University, Waterloo, Ontario, Canada

FISH culturists have long suspected that certain wavelengths of light exert harmful effects on developing fish embryos. Reconstruction of the Chatsworth Trout Rearing Station of the Ontario Department of Lands and Forests was completed in 1962 and it was necessary to select suitable artificial lighting for the hatchery section. Perlmutter and White<sup>1</sup> reported serious mortality in developing brook trout embryos caused by light from white fluorescent tubes at the Coldspring Harbor Hatchery, New York. As a result of a study by Hamdorf<sup>2</sup>, the authors recommended that tubes emitting light near the red end of the spectrum be installed in hatcheries rather than those emitting blue or white light. To further investigate the relative safety of commercially available fluorescent tubes for egg incubation, the following practical trials were conducted.

## Methods

Recently fertilised lake trout eggs were obtained from the annual spawn collection at Lake Simcoe and incubated at Chatsworth over the winters of 1962-63 and 1963-64 (500 eggs per tray, four trays per trough). Experimental lots were reared in open hatching trays under four types of General Electric standard tubes—blue, 'cool white', pink, and gold. Embryos incubated under opaque covers served as controls. No attempt was made to vary the many parameters<sup>3</sup> since only a practical solution to the immediate problem was sought.

Lamps were installed in standard ceiling fixtures over individual tables of hatching troughs. Each table was shielded from the illumination of its neighbours by black polyethylene curtains suspended vertically from ceiling to floor. The light regime to which the embryos were subjected consisted of 4 consecutive hours in the morning, a period considered by the fish culturists to be more than sufficient for the care of the embryos. Details of the lighting arrangements at both Chatsworth and Coldspring Harbor are summarized in the table.

## Results

An analysis of variance revealed no significant statistical differences in mortality among the experimental groups. Cumulative mortality up to hatching in all trays varied between 25 to 30%, well within the range encountered at the hatchery for this species. The emerging fry of all groups appeared normal and were held for several weeks in the same troughs until transferred to outside raceways. We believe that the disagreement of these results with those of Perlmutter and White may be attributed to the smaller 'dose' of harmful radiation received by the Chatsworth eggs. The cover glasses over the fluorescent tubes at Chatsworth may have filtered out much of the harmful radiation. The data (see table) indicate that embryos at Chatsworth were subjected to one quarter of the radiation received by those at

Comparison of lighting arrangements at two trout-rearing stations

	Coldspring Harbor	Chatsworth
Dimensions of hatching trough	15 feet by 14 inches	16 feet by 10 inches
Vertical distance of lamps to water surface	6 feet	6 feet
Number of fixtures per table	3½ (end to end)	2 (separated)
Number of lamps per fixture	2	2
Number of lamps per table	7	4
Type of fixture	Open strip	Vapour proof with cover glasses
Duration of illumination per day	7 hours	4 hours
Type of lamp	Westinghouse 'cool white'	General Electric 'cool white', blue, pink, gold

Coldspring Harbor. This amount appears to be safe, at least for lake trout eggs.

#### Discussion

While our findings undoubtedly contribute to the present confusion concerning the sensitivity of fish eggs to light, they do demonstrate, however, that light of low intensity is not always necessary in hatcheries. Fluorescent tubes providing adequate illumination for human vision may be used after preliminary trials establish that the combination of wavelength, intensity, and duration of the light produces no harmful effects on the embryos.

#### Acknowledgments

Phil Hartman, manager of the Chatsworth Trout

Rearing Station, conducted the experiments and Robert Mason, formerly district biologist of the Hesper district, carried out the statistical analysis.

(Reprinted from THE PROGRESSIVE FISH-CULTURIST U.S.A.)

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## Readers' Queries Answered



### Fighter Fry

I recently had some Siamese fighting fish (*Betta splendens*) spawn in my tank. The young fish are on their own in a 24 in. tank and there are about 50 of them. When will they develop their labyrinth (they are about a 1/2 in. long and about 1 1/2 weeks old; I have heard that I may experience losses during this period)? Secondly, is the tank big enough and when will the young males start fighting? They are fed on Infusoria tablets and are just starting to eat brine shrimps.

The labyrinth organ will develop within 2-3 weeks after hatching, and many losses of fry at this stage are connected with the development of this organ. The water depth requires to be only about 6 in. during this period and the tank temperature maintained at about 80°F (27°C). The tank must be well covered so that the warmth of the air in the tank above the water surface is not dissipated. The fact that the fry are now weaned on to brine shrimps means that one hurdle has been overcome—losses are often experienced through failure to feed the newly hatched fry with sufficient or suitable food—a constant supply of

Infusoria. Newly hatched brine shrimps can now be varied with ground tubifex, sifted daphnia, micro worms (offered very slowly) up to the larger foods such as white worms, larger daphnia etc. A most successful breeder of fighters in this country has this to say on the subject of separating the males: "When do you part the males developed from one spawning? This seems to depend on the fish concerned. Some males will start fighting at 6-7 weeks of age. Others will not fight until 4-5 months old and others hardly scrap at all. I never part my males until I have to, and that is at the first sign of scrapping. I have found that the females also fight." Your tank size is quite adequate and will be for some time. Once the fish have to be separated out the selected fish can be grown on in small tanks or even large jars or small glass containers made from glass off-cuts and silicone aquarium sealant.

### Skin Holes

I have an oscar that shows a few white spots, bigger than 'white spot', that appear on the body near the base of the fins and on the head. These spots

sometimes disappear without trace and sometimes leave a small hole. The disease doesn't seem to be contagious nor does it respond to a wide range of chemical cures.

These 'holes' appearing after apparent infection in the heads of oscars, it has been suggested, are caused by a condition resulting if the diet is inadequate. These fish require whole fish to eat, at least occasionally, and guppies or goldfish (depending on the size of the oscar) are commonly used as foods by oscar-keepers.

### Changes of Hardness

I know it is rather dangerous to put fish in water of a different pH from that they have been used to, but does this also apply to waters of different hardness? Our local tap water is very hard (about 250 p.p.m.) and I could never get really satisfactory plant growth in it, so when the time came to strip the tank down and set it up again afresh, I used a mixture of tap water and distilled water to bring the hardness down to 87 p.p.m., and a peat filter to breathe some life into this rather clinical mixture. This seems to have done the trick as far as plant growth is concerned but when I come to buy a stock of fish for the tank they will have come from tanks of local tap water. Could you advise me how to condition the fish to accept the softer water, if indeed they need conditioning?

It is not usual to take steps to adjust differences in water hardness when transferring adult freshwater



fishes. Although some species may be temporarily disturbed by a major change in hardness this is not of serious consequence. When transferring eggs or fry it is, however, very important not to subject these to changes in hardness or pH. If you wanted to lessen the degree of change in water hardness you could arrange for the water in a quarantine tank for new fishes to be of hardness value midway between that of the source tank and your own aquarium. Adjustment would then occur during the 2-3 weeks period of quarantine.

### Cyclops

*I have been told that it is a good idea to add a few cyclops to the fry in a breeding tank since they will breed and provide the fry with exactly the right-sized food to follow on from the Infusoria culture.*

We would think this a very hit-and-miss method of supplying live food to fry, as well as being a practice carrying potential danger. Many fish breeders go to great pains to make certain that cyclops do not get into a breeding tank of very small fry since these crustaceans are reputed to eat them. It is not certain that cyclops are capable of this but most people prefer not to take the chance.



## The AQUARIUM SHOW '74

Friday, 25th to Sunday, 27th October

at the Royal Horticultural Society's Old Hall  
Vincent Square, London S.W.1

**SCHEDULES** for this year's Aquarium Show are available and can be obtained from the show secretary, Mr D. Lambourne, 7 Wheeler Court, Plough Road, London SW11 2AX (phone 01-223 2630) or from FFM, 554 Garratt Lane, London, SW17 0NY. Classes this year are for: **Pairs** (herbs, characins, cichlids, aos egglayers, labyrinth, toothcarps, aos catfish, Corydoras and loaches, rainbow, danios and White Cloud Mountain minnows, guppies, swordtails, platys, mollies, aos livebearers); **Breeders** (egglayers, guppies, swordtails, platys and mollies, aos livebearers, coldwater); **Coldwater** (single-tailed goldfish, twin-tailed goldfish and aos coldwater); **Marines** (tropical and coldwater); **Plants** (rooted, cuttings and floating); **Furnished aquaria** (club tropical, club coldwater, individual tropical, individual coldwater, miniature furnished, club aquascape, individual aquascape); and the **Special Class** for any fish 12 inches overall or more from classes B-M.

**EVEN** if your Society does not possess a master carpenter, don't let this deter you from entering the Tableaux Competition for 1974. Last year's winner, devised by Portsmouth AS, was a 'natural' forest scene with massed tropical lily plants and greenery and live zebra finches. The tableaux are judged by the entering societies themselves and, as serious aquarists, they will not fail to appreciate a tableau of well-arranged tanks of fine fish as well as the mechanical genius that has been revealed by this competition. Any society intending to enter that has not yet returned the completed Entry Form are asked to do this as soon as possible now please. Tableaux Entry Forms should be sent to FFM, 554 Garratt Lane, London, SW17 0NY.

**AMONGST** visitors to the Show will be parties from two Belgian aquarist societies, Brugse Aquaristvrienden and Astronomus Oostende. Is your Society taking advantage of the special rates offered for club parties buying tickets in advance? These are 22p for adults and 5p for children (under 16) and will be sent if application with remittance is made as early as possible to FFM, 554 Garratt Lane, London, SW17 0NY.

A prize-winner in the Tableaux Competition at The Aquarium Show last year



Photo: D. PHILLMORE

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## A Red-Spotted Panchax

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*Aplocheilichthys panchax* var. *rubropunctatus*

OVER 90 years ago, in 1882, a certain Mr Hamilton found, in the Indian Ganges area, a very colourful fish to which he gave the name *Esox panchax*. Subsequently it appeared that this name was incorrect—it is now known, correctly, as *Aplocheilichthys panchax* of the family Cyprinodontidae (egg-laying toothcarps). But still these fish hold the aquarium-keepers' interest: they are colourful, quite small, and easy to keep and care for; in fact, a very useful aquarium fish.

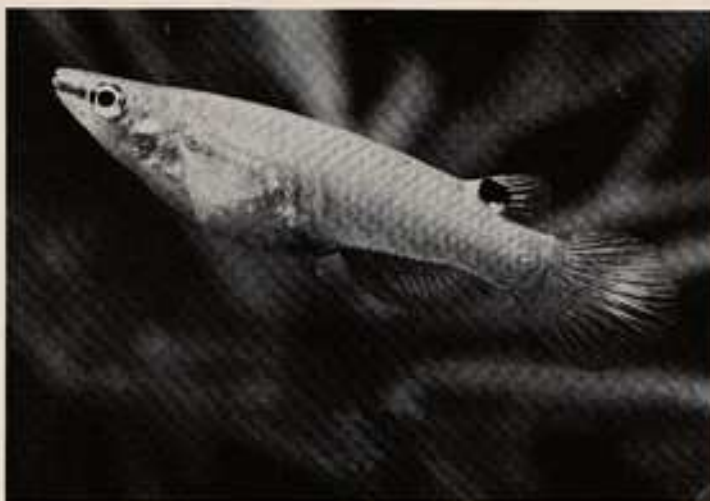
Referring to their natural habitat, it is easier to speak of a continent rather than just an 'area' where they may be found since their distribution covers an enormous stretch of land—from northern India in the Ganges and Brahmaputra drainage areas, across Pakistan and Burma eastwards to Thailand and south to include the Malayan Archipelago and Indonesia. They are to be found in a variety of waters, fresh or brackish, moving or still, and particularly in ditches, canals, swamps and bogs and the side streams of rivers. A typical milieu for our *A. panchax* is the shallow, somewhat brackish coastal waters in the estuaries of the rivers of south-east Asia. Such waters are often disturbed and yellowish-coloured with a daily tide. During rainy periods the water remains fresh but during dry periods of any length it becomes brackish. But *A. panchax* is not affected by this continually changing percentage of salt in its water.

The rather dirty water in which this fish lives in ponds, ditches and canals is, of course, rich in live foods such as daphnia, tubifex

By W. A. TOMEY

Photographs by  
the author





On the facing page the male *Aplocheilichthys panchax* is seen, and above is his less ornate mate. Length of the fish is about 3 inches at full maturity.

Right: Enlarged view of a developing egg of *Aplocheilichthys panchax*. The young fish can be seen through the clear egg membrane and also visible are the fine threads by which the eggs stay attached to water plants. The eggs are quite hard and are relatively large (nearly 2 millimetres across).

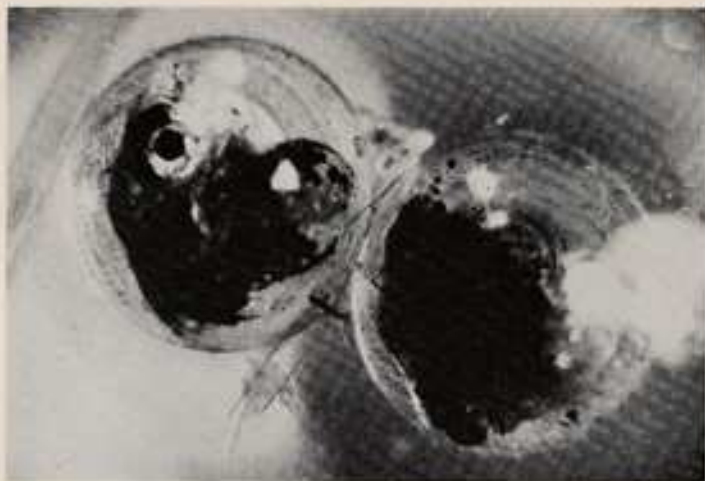
and mosquito larvae, for which this beautiful species has a particular preference. So much so that, in many parts of the tropics, these fish have been specially bred to assist in the fight against malaria to help improve the health of the inhabitants.

It is more or less impossible to describe their coloration--this is very variable and is affected by a number of things, from the actual area they are found to whether they are cross-bred.

*Aplocheilichthys panchax* var. *rubropunctatus* means the variety 'with the red spots' and these certainly add beauty to the other colours they show. The females are not so well coloured; the basic colours are greenish-grey with colourless fins except for a vague yellow or orange-red coloration that sometimes shows along the fins' edge. The dorsal fin, however, always carries the black spot shown in the photograph.

A temperature of 69° F (20° C) is suitable for





Eggs a short time before hatching, with the eyes of the young fish clearly visible.

their living requirements. A very important point is that their tank must be well covered. They are excellent jumpers and if they see an insect above the water surface they will jump at it through the smallest hole! They seem to appreciate some floating plants on the water surface though it is by no means an essential requirement.

Propagating *A. panchar* is quite simple. The

eggs are rather large (1.6-1.8 mm. in diameter), clear and hard-shelled and after they have been laid they hang between the plants on very fine, buoyant threads. It is a prolific egg-layer and can produce 15 to 25 eggs daily, which will hatch from 9 to 15 days later depending on the temperature. A day after hatching the fry eat freshly hatched brine shrimp and they will thrive on this diet.



Enlarged view of a newly hatched youngster. Within 24 hours of hatching these fry can be given freshly hatched brine shrimps as first food.



## COLDWATER SCENE



By FRANK W. ORME

## Best Buy — First or Second Class? ● Ponds that Need Tidying

**D**URING the early part of the season I had a visit from two people who were interested in obtaining young lionheads. During our lengthy conversation it became apparent that whilst one had considerable knowledge of fancy goldfish the other was an absolute novice. Some time was spent in discussing the various requirements of warmth, light, position and size of tanks, together with the pros and cons of various foods that gave the most successful results in raising the different varieties of goldfish. My own fish house arrangement was examined in the hope, they said, of incorporating some of the ideas into their own set-ups.

Then the more serious matter of selecting the young fish began, and it was at this point that the two differed. The novice chose only the best of those which I offered—and paid accordingly; the older and more experienced man sought, and picked out, only second-class specimens that had various faults and, of course, paid considerably less. His explanation to his younger colleague was, roughly, that although the dearer fish were better to look at they would nevertheless throw a considerable number of 'scrap' fish when bred together and only a very few would be worth keeping. His poorer quality fish would also have a very large number of throw-outs in their spawning, but—because they were from an established strain—there would also be a number that would be of better quality than the parents, and with these he would begin his serious breeding after disposing of the fish which he had just purchased.

There is some truth in this explanation, for, if fish of poor quality from a pure line are used together, on the law of averages there should be a few good quality young produced provided that the selected fish do not carry too many bad faults. It is therefore worth remembering that when buying young fish it is not an absolute essential that they should be top-class specimens if they are from a known strain. Nevertheless, the chances of success are increased if the best fish obtainable are used as breeders. When using fish of poorer quality it is essential that they should not be bred back with their own young, for if this is done any faults carried will be more likely to appear in the strain. Therefore, if using second-grade young

fish for breeding purposes which subsequently produce a few decent quality young, it is from the pick of these youngsters that the future breeding stock should be chosen, and preferably the original fish should be disposed of.

Both purchasers of my young lionheads were therefore correct in their individual choice, provided that sensible rules are followed with future breeding, and thereby lies the lesson for the newcomer thinking of purchasing his first young fancy goldfish.

The pool season is now moving into the end of its season and it is therefore a good policy to remove, where possible, dead flower-heads and leaves from the water lilies. If blanket weed is evident pull out as much as you can; a forked stick can be twisted into the mass and pulled out. Regular attention in this manner will help to keep the pool tidy and avoid some of the causes of pollution. Your fish will soon be showing signs of increased appetite and this should be catered for with a slight addition of extra food, preferably by shortening the interval between feeds so that an extra one can be fitted in. By allowing the fish more food they can begin to build up the essential body fats that will carry them through the winter. These remarks are also applicable to fish housed in aquaria indoors, although they will in all probability not exhibit any signs of increased appetite until much later than pond-kept fish, owing to the more protected conditions under which they live.

Readers of PFM will be aware of the Ford Motor Company's sponsored 'Save the Village Pond' campaign, which is designed to preserve this fast disappearing feature of the countryside. Too many natural pools are falling to the onslaught of the bulldozer, as developers fill them in to provide housing sites and farmers turn them into additional crop growing areas. In so doing spawning sites

the reefs. In fact I worked the same reefs month after month for 16 years and yet I could still reap a profitable harvest from them. I would work the area systematically, leaving reefs to rest for a few weeks while I worked another area. When I returned there would be a new complement of fishes to collect.

The neon gobies in particular always fascinated me for they were so beautiful and such inoffensive little creatures. I finally learned how to catch them and became very proficient at it. Where it was a real triumph to catch two or three in a day in my early collecting days, I finally was able to collect a hundred or two in a day along with a full collection of other fishes. This was accomplished with training and patience. Here is how it is done.

First of all, you need a good collecting net, one made of plastic screen. A standard shrimp net frame is excellent. The net should be flat at the bottom with rounded sides and it must be made of plastic screen. Cotton or nylon netting simply won't do as it will move back and forth and frighten the gobies away. A large aquarium net frame, 7 by 10 inches, will also work fine but you must replace the nylon netting with a screen net, 12-15 inches deep.

Your next step is to locate the neon gobies. They are found almost exclusively around large brain or boulder corals in the Caribbean and Florida coast. Any large solid type coral on the Florida reefs will usually contain a family of gobies. They are also found under ledges occasionally but their main home will be on the large corals. You will see them skipping busily about the coral heads, chasing each other or exploring the coral head for food or looking for a large fish that needs its parasites removed.

They will not be afraid of you if you swim towards them slowly. This is one of the tricks to collect them. The next is to take it slow and easy. If you try to rush the little gobies, you won't collect them at all for they will swim off in every direction except towards your net. The way to collect them is to set your net about a foot in front of them, holding it tightly against the coral. With the other hand, slowly but steadily sweep the gobies towards the net, making certain not to move the net. Keep the gobies moving and they will usually swim right into the net. When they are well inside, lift the net towards the surface and bend it over so they cannot escape. Then return to the surface and place them in your floating live well or in a collecting bucket if you have a companion in the boat who can assist you.

That's all there is to it. It may take you a little while to perfect your collecting but the main thing is to go slow and easy. Once you frighten the little fish, he will be most difficult to capture. With practice, you will be able to catch a half dozen

gobies at one time, especially the small ones when they have just left the nest. My record was 22 adults at one sweep. This was most unusual as you rarely find that many adults in close proximity. But I once found an isolated coral head that was completely covered with gobies. The top of it was solid blue. There was no other coral around for a considerable distance so the babies couldn't leave home as they normally do. Instead, they multiplied into one big happy family until I came along to thin out their ranks. I didn't take them all, I left a number for seed, which is my usual practice.

There is a lot of nonsense written about collecting. The people who write it have no idea about actual collecting and don't bother to ask someone who has worked in the field for 20 years. First of all, you positively do not need drugs or poisons to make a good haul. Secondly, the mortality rate of fish collected is not great if the collector does not use drugs or poisons. My collecting losses were less than a half of one percent from the time the fish was collected until it was sold. If I collected three hundred fish in a day, I usually sold all three hundred of them.

A conscientious marine collector does not destroy the reefs nor does he seriously deplete the coral fishes there. In fact if you followed after me day after day, you would not even be able to tell that I had visited an area. At one time I took a number of scientists from the University of Miami Marine laboratory with me on a collecting trip to verify this very fact. Some nuthead fanatic had stated in the newspapers that the marine collectors pry up the reefs with crowbars to get at the specimens, which of course is sheer nonsense.

An experienced collector doesn't even work on the main reef, for there is too much coral there and no way to isolate the particular specimens he needs. Collecting marine fishes could be likened to collecting butterflies on land. If you pursued a butterfly and he landed in an apple tree, there would be no way that you could net him without seriously entangling your net. So instead, you wait until he is out in the open, in a meadow. Then you easily place the net over him. It is precisely the same with coral fishes. You catch them in rather open areas rather than on a dense reef. It's as simple as that.

As for the neon gobies, consider them like a beautiful woman. If you chase them too hard, you won't catch them at all (from MARINE COLLECTOR'S GUIDE).

Another thing. Leave a few for seed and for the next fellow. Gobies are prolific and if you leave a few there, next time you visit the reef, there will be as many as when you first visited the area. Keep them at a stable temperature, as they are highly susceptible to 'ick', and don't destroy their homes. They'll never forgive you (I won't either!).





by  
ARPEE

## Personal COMMENT

THE recurring controversy as to whether or not to feed live food such as daphnia and tubifex to aquarium fish leaves a lot of beginners either puzzled or angry or both. The dealer stands in a most invidious position—on the one hand he is accused of failing to provide some of the essential foods, and on the other he is criticised for marketing 'disease-ridden' creatures for the consumption of our charges. Nearly all fishes seem positively to relish food that jumps, wriggles or darts, and their reaction to food which appears to be better than usual may endow them with better colour or condition or with the desire and ability to procreate themselves. From the keeper's point of view this is a highly desirable state of affairs, despite the health risk said to be involved.

There are claims for a number of preparations that they 'purify' live food. This they may do in some part but I suggest that nothing purifies, in the present context, like a jolly good wash. It is not too much to subject tubifex to a strong water jet several times a day, and daphnia should first be strained into a daphnia net and washed thoroughly under a well running tap. If you have time decant them a second time from a further wash in clean tap water. By this means you will have taken every reasonable step to dislodge and lose any free cysts of white spot, for example, which might have come in through the back door.

This rather fussy technique applies regardless of the source of your live food. It may have come from a dealer you implicitly trust or from a pond which you have every reason to believe cannot support fish life. However, you don't always see the herons and mallards which come and go, and even if you do you have no opportunity of examining whether they are giving a free lift to an 'ich' colony on their legs or feathers.

Subject to these precautions I have never really hesitated to feed my fish on both daphnia and tubifex and since some of them are doing quite well in the longevity stakes I can hardly complain. One theme does run through all this, however, and that is that tubifex has been considered to be the most suspect of all fish foods from the point of view of disease transference. It always seems a little

ironic that, of all the foods there are, the most consistently available is that which fish are most likely to refuse, and I have often seen ostensibly hungry fish snap up tubifex, only to eject it immediately, apparently in utter disgust.

The fittest fish certainly seem to be those whose diet includes a variety of vegetable and animal constituents, and enjoyment seems to increase inversely to the degree of artificial processing. At all costs the beginner should take care not to restrict the menu to one single item simply because his fish appear to go mad over it. I have experimented on these lines and satisfied myself that fish can get fed up with daphnia and even with earthworm after a protracted run on the same thing. Equal care was taken to ensure that the delight which became evident with the return of the dried food did not mean even temporary abandonment of living food as an essential part of a sound diet.

I was watching my pond fishes the other day. There are lots of little roach and rudd. How these midgits rose, time after time, to the fly, and how often, surprisingly, did they succeed! From my vantage point it certainly looked as though they were enjoying themselves and I at once made a mental note to collect some greenfly for my tropicals.



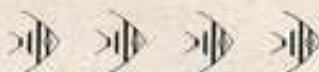
Although some fishkeepers are convinced of the value of fruit flies in enabling hatchet fish to maintain a rather longer hold on life than is so often the case under normal aquarium conditions, and nobody would question the value of live food if there is the slightest possibility that it will increase the chances of longevity, there are substitute foods available.

These substitutes are not at all difficult to muster up. Finely chopped white worms is a splendid food. It should first be put into a small container like a paste pot, half filled with water, and then fed into the tank using an ordinary eye-dropper. Give a number of short, sharp squirts over the surface of the water, and the hatchet fish will soon catch on. In the beginning they will be scared and swim away from the point of impact, but if you pepper the whole surface with a scattering of tiny pieces of worm, they will find it before them wherever they go and take it with evident relish. In course of time, after they have cultivated the taste for it, they will dive several inches to take much larger pieces. Any uneaten food is, of course, swiftly taken up by the midwater and bottom-dwelling species.

During the summer it is possible to collect

enormous quantities of aphids from your garden plants, provided always that you have not used any form of garden insecticides on them. This proviso is absolutely vital, and if there is the slightest doubt over the matter, leave well alone. It may be found that aphids are most simply collected by brushing them off the plants with a fine camel-hair brush. This avoids the squashy and often profitless method of collecting them by finger, and it is quite amazing to what extent one can 'milk' a particular shoot of its succulent bounty for hatchets and similar surface feeders. It may be noted that aphids are not only the familiar greenfly of the rose bushes. They may be black, red, grey, pink and varying shades thereof, and multiply at astonishing rates when the weather warms up. If you wish to attract them, certain plants are noted for their appeal, and I have found that broad beans are second only to nasturtiums for blackfly, and roses are wonderful for green- and red-fly. One variety of scentless red-tubed honeysuckle yields greyfly in the early part of the season, but I don't know whether this is attributable to its sheltered situation or something more basic. The hatchets have had a good time this year.

If you do take the trouble to culture fruit flies, and for this you really need a lot of spare space in a warm environment, make sure that you obtain the 'wingless' type. The lady of the house can get rather difficult if the winged flies get around the place too freely!



It is my good fortune, from time to time, to review new books on aquarium keeping, as well as revised editions of old favourites—not as an 'expert' but as an ordinary reader and as a practising aquarist, and consequently the pastime is of considerable educational value in the main. I must admit to almost childlike anticipation whenever a new book arrives, or when I come across an unfamiliar title at the local library, and I usually set out with the hope that I shall end on a lyrical note: it is quite wrong to assume that critics are fundamentally gloomy individuals who, vulture-like, subsist on the corpses of rejected authors.

Every so often one comes across a book which charms from beginning to end, and others command academic respect from the title onwards. These provide the good moments and the memorable themes, and such as find their way to a permanent place on our bookshelves virtually become part of our lives. One of the biggest problems is that of revisions to these standard works, and it cannot be said that there is any greater hope of keeping them perennially youthful

than there is in the case of human beings. It is true that the catalogue of fishes has a better chance of keeping up with the times than the guide to fishkeeping, principally because, nomenclature apart, there is less controversy about a list than there is about a technique. Hence, the whole matter of revisions requires a much greater delicacy of treatment than I have seen actually given by the majority of publishers, and one often wonders whether the latest edition has, in the event, really contributed anything at all.

There are some works we can all think of which are of greater interest as historic landmarks than as modern versions despoiled by ineptitude and inaccuracy. Even so, it takes a lot to devalue what was originally good to the point of uselessness. It is sufficient to say, perhaps, that some things are best left alone. It is perhaps permissible to revise a work because the author has since died or has given permission, if needed, for somebody else to deal with the updating. What seems incredibly stupid is for publishing houses to issue subsequent editions without referring them to the author. In many cases since there is no legal need for them to do so, revisions are put out with which the author would violently disagree, but he is given no chance of having a say in things.

It is this sort of situation which makes the critic pretty uneasy because he often doesn't know whether he is taking the author to task or somebody completely unknown to him, and it thus seems that those with sensitive feelings may often get hurt for quite the wrong reason.

It will be clear from what has been said that conflicting information, even within the same book, may be in no way attributable to the author. It is regrettable carelessness which can, however, be put right by purely administrative action within the publishing houses who would do well to associate authors invariably with revisions of books they have written.

Far greater damage is caused by publishers who release works from snippet collectors who have pinched a bit of information from numerous works by real authors and have assembled them into a volume purporting to reflect their own experience. If this were done skilfully and with understanding of the material involved the results would be worth their price and the time spent on studying their contents, but this seldom happens. The outcome is usually an inelegant amalgam of disconnected thoughts without the thread of logic which runs through the genuinely original work, and the beginner can find himself in lots of trouble if he buys books of this calibre when setting up his hobby.

It pays to look at the author's practical fish-keeping qualifications if you are in any doubt about his bona fides, though this will only be one of



several pointers. If you give the book a quick look through and can find one howler there will probably be many more when you have had time to sit down and study it in depth. Look at the photographs and check whether there is any reference to them in the text. If there is none, they are there just for decoration and are immediately suspect. If there is a bibliography and acknowledgement of sources at the end of the book this is more usually than not a good sign, and the preface can often reveal a great deal about what is to follow. Look at the price, too, and beware of the cheap and flashy volumes by unknown authors, especially if there is a superabundance of illustration. You may well find that the latter is all the familiar old stuff you have grown up with, all packed between two covers: nothing much original at all!

Much of what is being published today should never be published at all, but most of it could do with a much closer professional study before release. The growing lack of authority and pride in the end product has cheapened the bibliography of the hobby beyond reasonable limits, and the remedy is really quite simple.



We live in a hard, competitive world, and it is part of the game that if we are dissatisfied with a product or a service, we should complain to the supplier. The law generally protects both sides from excesses from either direction, and on the whole I don't think I have much to complain about as regards the way my complaints are dealt with in matters outside fishkeeping. Immediately my hobby is involved I find that responses are feeble or non-forthcoming, and I wonder whether other fishkeepers find that this is so. I am not sure that the problems are confined to retail purchasers, as I have had dealers complain bitterly about the indifference or inefficiency of the main distributors, and I am sure that this is not exaggerated. Perhaps it is that the aquarium hobby just cannot pay the salaries of good public relations officers. Perhaps it is something else. Or am I just imagining it all? If readers have received any particularly wet or infuriating letters on this subject, I should be very interested.

## What's New?

### For Tidier Tanks

MORE and more pumps, heaters, thermostats, lighting have been designed over the years to bring greater efficiency to the hobby of fishkeeping although there can result a conglomeration of wires leading from the tank to the mains that hardly adds a beautifying effect to the aquarium. Arcadia Engineering Co. (460 Rathgar Road, Brixton, London, SW9) have designed a unit to overcome this problem. Taking the basic Standard Control Unit that they have manufactured for many years for fluorescent lighting, they have adapted this to act as a main tank terminal for all the other accessories. Called the **Arcadia De-luxe Control Unit**, the equipment is about 6 in. by 5 in.; it clips on to the side of the tank and only requires one mains lead. The unit has two built-in switches—one

controls the lighting and the other the pump, heater etc. Once connected the heater and thermostat are permanently in circuit. The switches are easily reached, being placed conveniently at the top of the unit.

### Lighting Out-of-doors

A NEW range of contemporary outdoor patio and garden all-weather

lighting and lights for pools, fountains or other underwater effects are available from **Quip Interior Design and Lighting** (226 Westbourne Grove, London, W11 2RH; phone 01-727 5377). These include luminous fibre glass rocks that can be used inside for decoration as well as outside in gardens, patios, driveways, paths, fountains etc. The rocks vary in size from 5 in. by 4 in. by 3 in. to 31 in. by 24 in. by 15 in. and carry bulbs varying from 25 to 150 watts.

### Products for the Keeper of Marines

WINGATE & Golding Ltd., Barton Stacey, Winchester, Hants, SO21 3JL (phone Sutton Scotney 792 and 793) are now the U.K. distributors of *hw Marinemix*. This was formerly known as *hw Meerensalz*, and the manufacturers of *hw Marinemix* claim almost 80% of the market in Europe over all other synthetic saltwater compounds. The makers' guarantee, included with every package, is very comprehensive and lists 62 trace elements which are stated to be present in exactly the same quantities as in

natural seawater. A 5 lb. pack will make approximately 15 gallons of synthetic seawater at a specific gravity of 1.020, the 10 lb. and 40 lb. sizes, 30 gallons and 120 gallons respectively. Also available are three other products for the marine enthusiast—*hw Limeswood Diffusers*, which are uniquely designed to allow a greater airflow, *hw Trace Elements* and *hw Hydro-koll* for the biological preparation and stabilisation of synthetic seawater.

## BREEDING FANCY GUPPYS

## One Mating — Several Broods

By F. CAMPBELL

GUPPYS, in common with other members of the fish family Poeciliidae, give birth to living young and are described in many books, still available, as being viviparous. This is the scientific term relating to creatures which bring forth living young, as opposed to oviparous which refers to creatures which lay eggs. Research undertaken in recent years, however, has revealed that guppies produce their young under conditions which are something of a combination of the two and are in fact ovoviviparous, which is defined as hatching of the eggs within the maternal body.

There are no half measures about the way in which the male guppy presses his attentions upon a female. Always mindful of his vulnerability to predators he deposits sufficient sperm at one go to fertilise successive batches of eggs. So far as he is concerned his job is then finished and off he goes in search of another receptive female.

The female guppy, after receiving the sperm, takes over and completes the process on her own. A batch of eggs immediately begins to ripen and after 7 to 10 days these are fertilised by some of the available sperm, the remaining sperm being kept in store until further batches of eggs ripen. The gestation period is around 20 days, so, including the ripening period, a brood is brought forth at intervals of approximately 28 days. This goes on until all the stored sperm has been utilised, which, under normal circumstances, means the entire life-span of the female because the chances are that another male will come along and add another parcel of sperm to that already in store.

This in itself constitutes one of the major difficulties confronting the breeder of fancy guppies. Assuming we have acquired a good looking female guppy, we cannot be sure whether

she is a virgin or not, and the only way to find out is to isolate her. If a brood appears she is obviously not a virgin and there may be other broods to follow. We then have two alternatives: to keep her isolated until she ceases to produce young, or take a chance and introduce her to the male of our choice, hoping that his sperm will influence the next brood. The first alternative could, of course, be a lengthy procedure and guppies have a nasty habit of giving up the ghost in the midst of lengthy experiments. Most of us therefore would be inclined to cross our fingers and challenge the uncertainty of the second alternative, and would probably be disappointed with the results.

Many scientists have endeavoured to discover whether or not, and if so to what extent, sperm from a second mating replaces sperm held in store from an earlier mating. Long and tedious experiments have been undertaken by various individuals in different parts of the world with conflicting results, which the hobbyist must sift for himself. In searching for a definite course to follow we can only reiterate that by using virgin females we can build up records of the traits which the females in our stocks are carrying. Out-crossings should be by males with if possible, phenotype females, that is to say, females which reveal the traits that they will pass on to their offspring. In this way we can minimise the tremendous problem arising from the question of sperm replacement.

Should the occasion arise where we acquire an unknown gravid female and wish to breed some of her traits into our stock we must first of all let her drop a brood. Then we must introduce our selected male and if he deposits his sperm before the next batch of eggs are fertilised there is a fifty-fifty chance that his influence will be apparent in the next brood.

THE NEWCASTLE GUPPY & LIVEBEARER SOCIETY will shortly be producing a Newsletter containing articles etc. about guppies and livebearers and everything connected with the keeping and breeding

of these fish. If any readers would like to receive a copy of this or contribute articles to it, Mrs J. Ranton will be pleased to hear from them. Please write to 128 Dunstan Terrace, Garth 18, Killingworth, Newcastle

upon Tyne, NE12 0TX.

Schedules for the NGLS All-Livebearer Open Show are now available from the same address and copies will be forwarded to anyone requiring them.



## A Critical Look at Methods of

# Aquarium Heating by Electricity

By CLIFF HARRISON

Photographs by the author

OUR tropical fish depend for their well-being upon the maintenance of a suitable temperature at all times, without excessive fluctuations. Except when efforts are being made to achieve a spawning, and with a very small number of species of exceptional delicacy, fish can tolerate considerable variations from what might be regarded as the 'norm' without undue harm befalling them. What they cannot stand, however, is unreliability of the equipment that regulates their environment: unreliability that can cause a thermostat to stick and 'boil' the occupants, or a heater to fail and 'freeze' them one winter's night. With a little thought when selecting the equipment, and a little trouble in subsequently examining it from time to time, very few of these accidents would happen.

Perhaps we expect too much nowadays in terms of reliability—there can be no 100% perfect and foolproof system at the sort of prices we are prepared to pay. Before World War 2 reliance was often placed on gas jets or paraffin stoves for heating aquaria. This meant that an inspection was needed every morning and evening, and cleaning or adjustments regularly undertaken. We now have the compactness and convenience (thank goodness) of electricity for heating our aquaria, the most familiar systems incorporating heating elements sealed into glass tubes which must then be kept submerged in the water. In theory this sounds a perfect system, but is it? The following points I offer as personal observations of countless instances where, for one reason or another, the system has brought disappointment or anger.

First, on the subject of the heating elements themselves, it does seem that they can become very brittle with age—those of the higher wattages (where the element consequently gets much hotter) being the shortest-lived. This brings me to combined heater-thermostats: on many models the elements can be seen to glow a vivid red, even in daylight, which I suppose is unavoidable as they have to compress a lot of heating power into such a short length of element. But this does mean that, if my theories are correct, these particular units, despite any advantages, might be expected to need replacement more often than ordinary heaters. On the basis of my own observations,

combined heater-stats do seem to have particularly short lives—often failing within 2 years or so, compared with the 4 or 5 or more years commonly achieved by ordinary heaters.

Another problem that often affects heaters (though not normally combined heater-stats, even submersible ones) is condensation—the presence on the inside of the tube, usually near the bung, of a cluster of tiny water droplets. Although the performance of the heater rarely seems to be affected by it, in the short term at least, such moisture must surely corrode the element in some way so as to shorten its life. And this is quite apart from the danger of a leak in the supposedly watertight rubber bung, which could lead to the aquarium itself becoming 'live' from electrical leakage.

Before anyone gets the impression that I'm rooting for a return to the bad old 'thirties, just let me acknowledge that without the simple, inexpensive and relatively reliable equipment we have today, the hobby would probably lose 90% of its followers: gas jets are just not on for a one-tank man with a display in the lounge. So let me expand on what I consider to be the most reliable set-up for keeping aquaria warm. First, two heaters (unless the tank is very small) will ensure that if one fails the other will probably still be working: but that means regular checks, either by dipping the hand in and clutching the heater when the thermostat shows it should be on, or alternatively by looking above the heater for the current of warmed water rising slowly and distorting the view of whatever is behind it (this can only be done where the water is quite still and undisturbed). Periodically you should remove the heaters (after unplugging at the mains) and examine for condensation, signs of burning on the inside of the glass, or a build-up of rock-like minerals on the outside. You should also check the thermometer occasionally with one of known accuracy: most of them, even if accurate to start with, can develop an increasing error after a few years, and your fish will suffer if kept permanently outside their ideal temperature range.

Thermostats require very little in the way of routine attention beyond checking that the contact points are not blackened or pitted—this is some-



On the lowest shelf of this staging constructed by Mr Dave Ellis (British Killifish Association) the parallel arrangement of the lengths of electric blanket heating cable is shown. Plastic tanks on the upper shelf are supported above similar low-wattage cables.

thing that in any case is likely to happen only if the maker's recommended current loading is exceeded. I have always preferred the external-type thermostats despite their rather greater initial cost, partly for ease of temperature control, and partly because it avoids yet another gadget taking up tank space. Two points I will mention which, if overlooked, can give cause for concern with these instruments.

First, the spring clip must be bent so as to keep the sole plate of the 'stat in firm contact with the glass, otherwise it cannot accurately 'sense' the temperature of the aquarium water.

Second, you may notice the temperature of the aquarium fall by a few degrees during the summer, or if the room heating is turned up particularly high, and rise by a few degrees during the winter months or in the early morning when the whole house is cold. This is nothing to worry about—just the ambient temperature slightly influencing the operation of the bi-metallic strip through the plastic body of the thermostat.

What I have described so far is, perhaps, the ideal for someone with one or two aquaria, or with rather more spread around the house. But individual heaters and thermostats have many drawbacks for the hobbyist with a number of tanks centred in one location. Their cost can quickly mount up; they need to be carefully installed so as to avoid the danger of electrocution, a particular hazard in the presence of spilled water and wet hands; and they must be disconnected from the mains each time the aquarium is cleaned out or

## Economies to be Made?

Ways and means to decrease your electricity bill this winter

OVER the U.K. as a whole electricity this winter will be costing around 13p per unit. Careful aquarists who have already taken measures to eliminate excessive consumption of electricity through heat escaping needlessly from tanks will be asking if there are any other economies to be made. Although it is unfortunately true that most measures aimed at saving on electricity costs will themselves involve some expenditure, it is the long-term view that has to be taken. The cost of heating in the future is likely to go up rather than down, and once heat insulation or whatever other

means has been adopted it is there to effect economy for the future.

Check the following list to see whether you are doing all that can be done to keep your electricity bill down.

Are your tanks being kept at too high a temperature? 70-75°F (21-24°C) is adequate for most purposes.

Have you covered the back panels, end panels and bases of tanks with a heat insulator such as



Part of the looped heating cable can be seen within the shallow 'heating box' on which the all-glass tank is resting. Photograph taken in the author's fish house.



moved. Many people must be aware by now that I am very enthusiastic about the use of waterproof heating cables for under-tank heating, such as have been successfully used at The Aquarium Show in London for the last 5 years, and as I have been using myself for almost as long.

The cables originally utilised were of the underfloor-heating type (made for embedding in concrete), and tended to be of fairly long lengths and high wattages (100 feet giving a total of 400 watts). These have to be disposed up and down shallow boxes (about 1 inch deep) on which the tanks will sit, and fixed lightly in place with

staples to ensure the 'runs' of cable do not touch one another which would cause localised over-heating of the cable. The outer covering of this cable is very tough, so it can be run in the open up the back of a stand so as to heat both the upper and lower banks of aquaria without having to be cut: the whole length of cable *must* be used, it should not be shortened or tampered with.

More recently I have been experimenting with the more versatile electric blanket cable, which is available in a wide range of resistances (from which the suitable lengths and their wattages for our use can be calculated). It would seem that if

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expanded polystyrene?

Are your tanks grouped so that heat rising from lower ones contribute to the warming of upper ones? Draughts in the area of the tanks should also be dealt with.

Is excessive water evaporation taking place from your tanks?—this has a big cooling effect and is easily offset by close-fitting cover glasses.

Is your fish house or fish room properly insulated? Glass fibre insulation of a roof or ceiling can save pounds annually, and so can double-glazing or the fitting of inner wooden glazed frames giving at least  $\frac{1}{2}$  inch air space to any windows. And don't forget the door—use nylon or metal strips to make it quite draught-proof.

Are you over-illuminating? Can you get the same plant growth by giving 1 hour less lighting a day? For several tanks close together the fitting of a time-switch could be a saving for all those occasions when the top lights are left on longer than necessary because you are out later or just forget to switch off.

Is your air pump pushing cold air into your tanks? Keep the aerator and air lines in the warmest position available.

Do you ensure that water used for topping up and replacing siphonage losses is the correct temperature?

Space-heating by gas is cheaper than by electricity.

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Lengths of heating cable required to provide wattages of approximately 2.5 watts per foot at 230 volts

Stated resistance of cable (ohms)	Total length (yards)	Total watts
48.0	12	90
28.9	16	115
15.9	21	160

damage to the cable is to be avoided, a maximum loading of approximately 2½ watts per foot is called for. Once the blanket element is installed in the shallow box, 'tails' can be soldered to the element's ends and the connections waterproofed with 2 inch lengths of airline tubing sealed at each end with a suitable substance—such as silicone rubber.

A word of advice: some of these heating cables tend to tighten a little when they are first used, others to loosen somewhat. So when you fix them in place in their box, leave a little slack; this may then be taken up (if necessary) after effect of running the unit for a half hour or so has been seen.

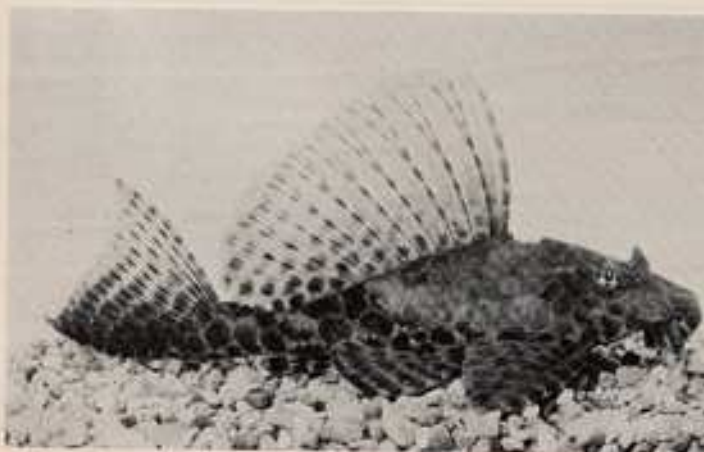
These heating boxes, if connected to an outside thermostat on one of the aquaria, have many advantages over more conventional means of space heating. They are virtually 100% safe, even with water being slopped around; tanks can be moved or removed without the need to disconnect; this method of heating cannot injure eggs or young fry; there is no superfluous equipment in the tank; it is

inexpensive, reliable and durable. For the fish room or fish house of modest size, it is a system that is hard to beat—space heating's great disadvantage is that it is most uncomfortable to work for any length of time in a temperature approaching 80°F, and alternative methods of undertank heating can be expensive and inefficient (electrical tubular heaters), or expensive and complicated (hotwater pipes connected to the central heating system).

At the time of writing suitable electric blanket cable is obtainable from Proops (who advertise regularly in the EXCHANGE AND MART) at 2½p a yard. As a guide, 30 watts per square foot of tank base area will generally suffice in a room that does not get too cold in winter: even less heating can be used in a well-insulated fish house that is filled to near maximum capacity. Some examples of the lengths of cable required and total resultant wattage for a selection of the available cable resistances are given with this article: in each case, calculation is for a mains supply of 230 volts.

## Is it New to You?

Photograph  
by CLIFF HARRISON



Any fish photographer would be appreciative of the way in which this specimen obliged by an impressive display of spread fins, unstintingly kept up for a very long time. At first sight it could be taken for a 'plecostomus' but the fish is an unidentified species of *Pterygoplichthys*. Owned by Mrs May Netherell, of Riverside AS and the Catfish Association, this spectacular catfish is approximately 6 inches in length.



## MARINIST'S NOTEBOOK

## How Much Light?

By ROY PINKS

NEW converts to marine fishkeeping are understandably bedazzled and often obsessed by the startling and unusual colours and colour combinations which immediately they find available, and this applies particularly in the case of tropical marines. It is natural that, after the considerable financial outlay in setting up the first tank, the proud owner should wish to display his fishes to best advantage, and this often prompts him to a measure of extravagance in the provision of overhead lighting. In my own case this happened not to be so, though this was by accident rather than design. My first tropical marine tank was developed from a brackish set-up, which I had lit rather sparingly on the basis of a recommendation I had read about somewhere. As this had always appeared to be perfectly adequate and was aesthetically acceptable, I saw no reason for changing direction when I converted the aquarium to marines.

In retrospect, my first efforts with some of the commoner fishes were certainly full of interest and adventure, but it is quite certain that of all the things which did go wrong or which caused things to go wrong, lighting was not one of them. True, certain visitors did criticise the middle-low key lighting which I maintained, and doubtless attributed it to my miserly streak, but I remained unmoved until I set up my second tank, at which point I probably doubled or tripled the intensity (it rather depended on whether I switched on one or both of the fluorescent tubes), and it immediately became clear to me quite what I had been missing. The sight of the percula clown under enhanced conditions was especially convincing, and I suppose that I could have gone on and on raising the lighting standards until there came a point when the effect was not tolerable in one sense or another. Of course, within a few weeks the first fish developed 'pop-eye', from which it did not recover, and this suggested that I might have done better to have retained my original inclination towards lower wattages, as this malady has been attributed to over-lighting.

I found that, although I could use the two tubes if I wished, there were some advantages in using one only at a time. I had arranged them in such a way that one was concentrated at the left side of the tank, and one on the far end. Thus, when only one was on, there was a really brightly illuminated area of water, but outside this the available light fell away sharply in the coral caves and crannies one has to provide for coral fishes. The visual appeal was good, if not startling, and it was possible to encourage an even growth of algae by ringing the changes: one tube on one night, and the other on the next, etc.

It would be difficult to state with any certainty what effect, if any, this might have had on the fishes. I got the impression that when the full lighting was on, there was more overall activity (though this may have been purely illusory), and there was much aggression amongst the damsels. I am now looking at the same tank, in which there are at present only three fishes. One is a humbug damsel (the original 'starter' fish), which lorded over the tank in solitary possession for a few weeks. The others are a newly acquired duet, comprising beau gregory and a yellowtail damsel. All are swimming peacefully in the darker end, and make occasional expeditions to the lighter end. For three of the most aggressive of our common fishes, they are doing quite nicely, and there is a quite attractive flash when they enter the brightly lit zone, so I can see little point in doubling the lighting in conditions like these.

I should like to see a study of light-intensities under water related to observed species and their activities at the time of observation. This might tell us a lot about whether or not we are doing the right things, and I cannot help feeling that in the quest for those vital formulae which add up to successful marine breeding, the question of quantity and quality of lighting will play a significant part.





### FBAS Basic Show Class Letters:

**A**, furnished aquaria and aquascape; **B**, Barb; **C**, characin; **D**, cichlid; **E**, labyrinth; **F**, egg-laying toothcarps; **G**, tropical catfish; **H**, Corydoras and Brochis; **J**, rasbora; **K**, danio and W.C.M.M.; **L**, loach; **M**, a.o.s. tropical egg-layers; **N**, pairs of fish; **O**, guppy male; **P**, guppy female; **Q**, swordtail; **R**, platy; **S**, mollie; **T**, a.o.s. livebearer; **U**, singletailed goldfish; **V**, twintailed goldfish; **W**, a.o.s. coldwater; **X**, breeders' classes; **Y**, marine fish; **Z**, plants.

AT the MIDDLETON & DAS third Open Show, Mr B. Marshallsea (Blackburn) with a *Sidthimantui borja* won the Best Fish in Show. Remainder of results as follows:

Platys: 1, D. & M. Laycock (Sheaf Valley); 2, Mr & Mrs Emmerson (Castleford); 3, Mr T. Hindley (Worsley). Mollies: 1 & 3, Mr D. Buckley (Heywood); 2, Mr J. Emmerson. Swordtails: 1, D. & M. Laycock; 2, Miss S. Clarke (Aireborough); 3, Mr & Mrs A. Darby (Hyde). Guppies: 1, Mr & Mrs D. Kurke (Castleford); 2, Mr Greenhalgh (Bury); 3, Mr & Mrs Scott (Sheaf Valley). aov Livebearers: 1, Mr & Mrs Toyne (Sheaf Valley); 2, Mr T. Tasker (Sandgrounders); 3, Mrs Tasker (Sandgrounders). Egg-laying toothcarps: 1, Mr L. Smith; 2 & 3, Mr B. Marshallsea. Small characins: 1, D. & M. Laycock; 2, Mr B. Mason (Worsley); 3, Mr L. Smith (Castleford). Large characins: 1 & 3, Miss S. Clarke; 2, Mr K. Smith (Middleton). Small barbs: 1, Mr & Mrs Toyne; 2, Mr L. Maynard (Ostram); 3, Mr T. Hindley (Worsley). Large barbs: 1, Mr & Mrs Ward; 2, Mr K. Smith; 3, Mr H. Warburton (Heywood). Sharks & foxes: 1, Miss S. Clarke (Aireborough); 2, Mrs Jones (Heywood); 3, Mr F. Chathern (Heywood). Coyfish: 1, Mr L. Smith (Castleford); 2, Mr E. Ebbrell (Hyde); 3, Mr L. Dean (Middleton). aov Catfish: 1, Mr T. Hindley; 2, Mr J. Emmerson; 3, Mr L. Burton (Middleton). av Loaches: 1, Mr B. Marshallsea (Blackburn); 2, Mr L. Dean (Middleton); 3, Mr & Mrs Toyne. Rasboras, danios & minnows: 1, Mr B. Mason; 2, Mrs Davies; 3, Mr & Mrs Emmerson. Dwarf cichlids: 1, Mr B. Marshallsea; 2, Mr L. Maynard; 3, Mr Horrocks (Ostram). Large cichlids: 1, Mr Davies; 2, Mr & Mrs Rigby (Worsley); 3, Mr L. Burton (Middleton). Angels: 1, Mr & Mrs Toyne; 2, Mr & Mrs Scott; 3, Mr Richards. Rift valley cichlids: 1 & 2, Mr S. Wolstenholme (Heywood); 3, Mr & Mrs Rigby. Fighters: 1, 2 & 3, Mr L. Smith (Castleford). aov Anabantids: 1, Mr L. Dean; 2, Miss S. Clarke; 3, Mr P. Wolstenholme. aov Tropical: 1, Mr B. Marshallsea; 2 & 3, Mr E. Kirkland (Hyde).

Breeders egg-layers (1-10): 1, Mr P. Armstrong; 2, Mr F. Chathern (Heywood); 3, Mr D. Wolstenholme. Breeders egg-layers (11-20): 1, Mr L. Smith; 2, Mr Abbott; 3, Mr P. Armstrong. Breeders livebearers: 1, Mr D. Buckley; 2, Mr B. Marshallsea; 3, Mr S. Hooton. Egg-laying pairs: 1, Mr & Mrs Scott; 2, D. & M. Laycock; 3, Mr & Mrs Toyne. Livebearing pairs: 1, Mr P. Arm-

strong; 2, Mr T. Hindley; 3, Mr & Mrs Toyne.

Common goldfish: 1, Miss S. Clarke; 2, Mr D. Wolstenholme; 3, Mr C. H. Whitney. Shubunkins: 1, Mr Walsh; 2, Miss S. Clarke; 3, Mr C. H. Whitney. Fancy goldfish: 1, Miss S. Clarke; 2, Mr Walsh; 3, Mr C. H. Whitney. aov Coldwater: 1, 2 & 3, Mr Walsh. Mini-jars: 1, Mr & Mrs Toyne; 2, Mr J. Wolstenholme. Ladies trophy: 1, Mrs Emmerson (Castleford); 2, Mrs M. Ward (Middleton); 3, Mrs B. Guiver (Heywood). Junior trophy: 1, Miss H. Johnson (Hyde); 2, Master G. Dean (Middleton); 3, Master P. Crowther (Middleton).

THE BIRMINGHAM SECTION of the FGA meet on the fourth Sunday afternoon of each month at the Glebe Farm Community Centre, Stretford, Birmingham. Mr L. Jones has been elected chairman and five new members have joined—Mrs M. Swain of Winslow, Mr E. G. Willis, Winslow, Mr & Mrs Mitchell, Firs Estate and Mr D. Tait of Stroud. All guppy hobbyists are made welcome here, where they will learn the art of good guppy breeding and keeping. The major honour awards were won by A. C. and I. Truman, who claimed Best Male, Best Breeder and Best in Show.

AT the twenty-first Open Show held by LLANTWIT MAJOR AS there were 553 entries benched, this being the largest number ever received. The show was an outstanding success and Llantwit Major are indebted to all South Wales societies and those from as far afield as Torbay, Taunton, Trowbridge, Basingstoke and Bath for their valued support, and also to the FBAS judges, Mr C. Creed, Mr P. Jordan, Mr G. James, Mr E. Myer, Mr J. Wheeler and Mr J. V. Jeffery, for their excellent work in pointing every fish on the show benches.

Best Fish in Show and gold pin award to Mr H. Crick with a red fin shark. Highest pointed Llantwit Major entry was also won by Mr H. Crick. The FBAS trophy winner of class Q with a female green sword was Master K. Williams (Rhondda). Remainder of results were:

Key to societies: B, Barry; Bs, Bath; Bas, Basingstoke; C, Cardiff; EV, Ebbw Vale; LM, Llantwit Major; N, Newport; PT, Port Talbot; R, Rhondda; S, Swansea; Td, Taunton; T, Torbay; Tr, Trowbridge.

Tropical: Ad: 1, Mr P. Thomas (S); 2 & 3, Mr J. Thomson (LM). Ag: 1, Master J. Edwards (LM); 2, Master R. Newton (LM). B: 1 & 3, Mr M. Thomas; 2, Mr J. Egan (PT). C: 1, Mr C. Harding; 2, Mr D. R. Warrnant (C); 3, Mr W. G. Best (S). Ca: 1 & 2, Mr C. A. Short (N); 3, Mr C. Turner.

D: 1, Mr D. R. Warrnant; 2, Mr C. J. Morrison (PT); 3, Mr A. Coyer. Da: 1, Mr K. Payer; 2, Mr P. A. James; 3, Mr J. M. Harris. Db: 1, Mr B. Bisscott (Bas); 2, Mr P. Payer; 3, Mr T. Taylor & family (Bas). E: 1 & 2, Mr G. G. Cattle (Dorset); 3, Mr P. Thomas. Ea: 1, Mr M. Brown; 2, Mr C. Turner; 3, Mr T. Taylor. F: 1, Mr C. E. Morrison; 2, Mr & Mrs M. Williams (R); 3, Mr M. Addicot (N). G: 1, Mr W. Limbeck (LM); 2, Mr & Mrs M. Williams; 3, Mr M. C. Guthrie (Barry). H: 1 & 2, Mr & Mrs M. Williams; 2, Mr R. S. Wigg (LM). Ia: 1 & 3, Master D. Earnshaw (T); 2, Master J. Edwards. J: 1, Mr & Mrs H. Williams; 2, Mr D. Egan; 3, Mr D. R. Warrnant. K: 1, Master R. Newton; 2, Mrs Scamion; 3, Master D. Earnshaw. L: 1, Mr P. Thomas; 2, Master P. Glover (LM); 3, Mr C. Turner. M: 1, Mr H. Crick; 2, Mr M. Loveless (C); 3, Mr T. Taylor and family. N: 1, Mr C. A. Short; 2, Mr S. Nelson; 3, Mr J. J. Edwards.

O: 1 & 3, Mrs P. Purdy (EV); 2, Mrs B. Castle. P: 1, Mrs P. Purdy; 2, Mr M. Thomas; 3, Mr J. Egan. Q: 1, Master K. Williams; 2, Mr M. Thomas; 3, Mr R. Perkins (PT). R: 1, Mr P. Payer; 2, Mr D. J. Davs (C); 3, Mr J. Egan. S: 1 & 2, Mr W. G. Best (S); 3, Mr T. Taylor & family. X: 1, Mr M. A. Smith (R); 2, Mr D. Warrnant; 3, Mr M. Addicot. Y: 1 & 3, Mr C. Turner; 2, Mr C. Harding. Coldwater, W: 1 & 2, Mr W. H. J. Matheson (T); 3, Mr C. Rupert. U: 1, Mrs J. Griffiths (T); 2 & 3, Mr C. Rupert (PT). Va: 1 & 3, Mr T. Clegg (R); 2, Mr C. Rupert. V: 1 & 2, Mrs J. Griffiths; 3, Mr D. R. Warrnant.

WHEN Mr J. Stillwell talked to WEYMOUTH AS on breeding tropical fish he described ways of setting up breeding tanks for many different varieties of fish. These included making a glass 'trap' in a tank to save the young of livebearers; cutting pieces of hose pipe to provide nesting places for khuli loaches and setting up an old bath in the garden to breed White Cloud Mountain minnows. Although these fish are tropical fish, they live in the mountain streams in their natural habitat and can therefore stand out temperatures during the summer months. Table show results were: *Hyphessobrycon*, *Hemigrammus* etc.: 1 & 3, Mrs J. Grundell; 2, Mr D. Mullen. aov Characins: 1, Mr D. Mullen; 2, Mr B. Dalley. Goldfish: 1, Mrs J. Grundell.

### THE ASSOCIATION OF MIDLAND GOLDFISH KEEPERS

held their bi-monthly meeting at the Foleshill Community Centre, Coventry. Members exhibited specimens of the goldfish varieties they kept and these were commented upon by the well-known Midland breeder, Mr T. Sutton. Mr Sutton has over 40 years experience of fancy goldfish breeding and his knowledge was freely drawn upon when he gave the membership a talk upon the selection, breeding and raising of quality goldfish. Many questions were put to the speaker



and very full and interesting answers given in reply to the appreciative audience.

THERE were 450 entries at the HAVANT & DAS fourth Open Show at St George's Hall, Waterlooville where Mrs S. Parrish (Hounslow) with a *Glossoma bipleyae* won the Best Fish in Show. The FBAS Championship trophy for Native Marine Fishes went to Mr K. Whiting (Havant). Other trophies won were as follows: Dittman & Malpas Cup for best livebearer, Havant & DAS Characin Cup and Janet Blofield Cup for best dwarf cichlid, Mr A. Weaire (Southampton); John Taylor Cup for best brooder, Mr D. Jones (Southampton); John Taylor Cup for best sunfish and Havant & DAS cold-water Cup, Mr E. Binstead (Plymouth); Havant & DAS Cup for best barb and D.F. & D. trophy for best rasbora, Mr H. Armitage (Havant); Havant & DAS Catfish Cup, Mr K. Taylor (Havant); Havant & DAS Cup for best 409 Goldwater and Vernon Heat Cup for best twintailed goldfish, Mr D. Sooles (Havant); John Dickinson Cup for best 409 tropical egg-layer, Mr L. Little (Bracknell); Ken Taylor Cup for best Rift Valley cichlid, Mr K. Rees (Gosport); Peter Sparshatt Cup for best pair of fish, Mr J. Blofield (Havant); Norman Fisher Cup for best danio or WCMM and John Taylor Rose Bowl for best loach, Mr S. Crabtree (Havant); H. & M. Cup for best labyrinth, Mrs S. Parrish (Hounslow). Remainder of results:

July: 1. Mrs D. Bunker (Havant); 2. Mrs J. Bunker; 3. Mrs S. Blofield; 4. Mr H. Armitage; 5. Mr A. Cropp (Basingstoke); 6. Mr R. Adams (Hounslow); 7. Mr H. Armitage (Basingstoke); 8. Mr J. Clarke (Gosport); 9. Mr A. Cropp (Basingstoke); 10. Mr A. Weaire; 11. Mr L. Little; 12. Mr J. Mayne (Havant); 13. Mr & Mrs Winter (Northampton); 14. Mr F. Willis (Havant); 15. Mr J. Dickinson; 16. Mr A. Weaire; 17. Mr & Mrs Winter; 18. Mr & Mrs Sparshatt (Gosport); 19. Mr K. Rees; 20. Mr L. Little; 21. Mr K. Groom (Middlesbrough); 22. Mr J. Mayne (Gosport); 23. Mr E. Adams; 24. Mr & Mrs Beattie (Southampton); 25. Mr & Mrs Bunker; 26. Mr C. Brown; 27. Mr P. Brown (Southampton); 28. Mr S. Parrish; 29. Mr & Mrs Able (Hants); 30. Mr & Mrs Newbury; 31. Mr L. Little; 32. Mr A. Crabtree (Dor); 33. Mr A. Weaire; 34. Mr J. Dickinson; 35. Mr J. Dickson; 36. Mr K. Taylor; 37. Mr K. Howell (Gosport); 38. Mr H. Armitage; 39. Mr A. Harnsworth (Basingstoke); 40. Mr J. Clarke; 41. Mr S. Crabtree; 42. Mr D. Jones; 43. Mr P. Miller (Dor); 44. Mr S. Crabtree; 45. Mr R. Adams; 46. Mr S. Crabtree; 47. Mr H. Armitage; 48. Mr G. Taylor (Gosport); 49. Mr D. Bunker (Havant); 50. Mr H. Pratt; 51. Mr

# FEDERATION NEWS

## Further Championship Show Results

1st September	Newbury & DAS	R	Platy
1st September	Bethnal Green AS	W	a.o.s. Coldwater
1st September	Wellingborough AS	U	Singletailed goldfish
8th September	Harlow AS	P	Guppy female
8th September	Bracknell AS	Ba	Barb
14th September	Hounslow & DAS	V	Twintail goldfish
22nd September	North Kent AS	F	Egg-laying toothcarp
22nd September	Torbay AS	Ya	Tropical Marines
29th September	Northampton AS	W	Native & Foreign
5th October	East London A & PA	Z	Plants
5th October	Cardiff AS	J	Rasbora
5th October	Runnymede AS	Ma	Labros
6th October	Ealing & DAS	Ba	Barbs
6th October	Newcastle Guppy & Livebearer Society	T	409 Livebearer
27th October	Ilfracombe AS	S	Mollies
10th November	Walthamstow & DAS	Xu-w	Breeders (coldwater)

Southend, Leigh & DAS	Cz	Mr P. Coyle (Independent)
Riverside AS	Dc	Mrs M. Nethersell (Riverside)
Catfish Association	H	Mr & Mrs J. Murphy (Ealing)
Thurrock AS	L	Mr T. A. King (N. Kent)
Mid-Kent AS	Xb-m	Mr T. B. Adams
Corringham AS	C	Mr P. Coyle (Independent)
Gosport AS	Dz	Mr K. Bissson (Basingstoke)
Brighton & Southern AS	G	Mr D. Lambourne (Rochampton)
Sudbury AS	K	Mr T. Cruikshank (Ealing)
Corby & DAS	NB-M	Mr D. Bitchener (Wellingborough)
Llanrwit Major	Q	Mr K. Williams (Rhonda)
Port Talbot & DAS	XO-T	Mr C. Turner (Cardiff)
Havant	Yb	Mr K. Whiting (Havant)
Half Moon AS	Cs	Mr T. Richardson
Salisbury AS	Ds	Mr T. Winter (Southampton)
High Wycombe AS	Mz	Mrs S. Hedges (Bethnal Green)

\*Winners of Federation Championship Trophies in classes for single fish automatically become eligible for the Supreme Championship Trophy Competition (to be staged at The AQUARIUM SHOW '74 at the Royal Horticultural Society's Old Hall, London, S.W.1, 25th-27th October). Six awards are made at this Competition, and each entrant will receive a Championship 'Certificate'.

J. Clarke; 5. Mr H. Armitage; 6. Mr S. Crabtree; 7. Mr J. Clarke; 8. Mr H. Armitage; 9. Mr J. Clarke; 10. Mr R. Quilley (Basingstoke); 11. Mr D. Jones; 12. Mr J. Scott-Morgan (Basingstoke); 13. Mr G. Burt; 14. Mr R. Adams; 15. Mr A. Cropp; 16. Mr W. West; 17. Mr & Mrs Beattie; 18. Mr R. Adams; 19. Mr W. West; 20. Mr R. Able (Dorset); 21. Mr & Mrs Bubb (Bournemouth); 22. Mr J. Jeffery; 23. Mr W. West; 24. Mr L. Little; 25. Mr J. Scott-Morgan; 26. Mr H. Armitage.

T: 1, Mr A. Weaire; 2, Mr R. Onslow; 3, Mr M. Strange.  
 Uab: 1, Mr W. Crockford (Petersfield); 2, Mr E. Binstead (Portsmouth); 3, Mr P. Stevens. Uod: 1, Mr E. Binstead; 2, Mr L. Menhannet (New Forest); 3, Mr W. Crockford. V: 1 & 3, Mr D. Stokes; 2, Mr E. Binstead. Wh: 1, Mr E. Binstead; 2 & 3, Mr V. Hunt (Havant). Wz: 1, Mr D. Stokes; 2, Mr J. Jeffery; 3, Mr V. Hunt. Xb-m: 1, Mr D. Jones; 2, Mr R. Aslet; 3, Mr M. Carrer. Xg-t: 1, Mr R. Onslow; 2, Mr & Mrs Robb; 3, Mr L. Little. Xop: 1 & 2, Mr & Mrs Winder; 3, Mr C. Beets. Xuw: 1 & 2, Mr L. Menhannet. Ya: 1, 2 & 3, Mr A. Harmanworth. Yb: 1, Mr K. Whiting; 2, Mrs D. Booker; 3, Mr M. Hinton. Z: 1, Mr L. Little; 2, Mr J. Hughes; 3, Mr J. Jeffery.

**DORCHESTER & DAS** have been reporting on their varied activities over the last few months. At one meeting a slide show was given of members' tanks entered in the Furnished Aquaria competition, which was won by Mr R. Christopher (2, Mr R. Taylor; 3, Mrs M. E. Fox) and by P. Jeffries in the junior section (2, Miss L. Fox; 3, Miss N. Voss). Mr R. Christopher has given a demonstration on how to make a show tank, and Mr A. Billington, with the assistance of three club members, gave a talk on preparing fish for showing. Two quiz shows provided both amusement and a good deal of new information to old and new members alike. Two new family memberships have helped to bring attendance figures to 40 members or so.

Winners of table show classes have been: Cichlids, Mr R. Taylor; section 2, Mr G. Fox. Labyrinths, Mr R. Christopher; section 2, Mr G. Fox. Angels, Mr R. Christopher; section 2, Mr N. Derrick. Ladies, Mrs I. Christopher. aov Coldwater, Mr R. Christopher; section 2, Mrs N. Fox. Juniors: guppies, Miss L. Fox; tetras, Miss L. Fox. The Society have held their annual club show (not open) on 18th August at the Youth Centre in York Road. Members of the public attended the stalls, competitions and displays of local water life to interest everybody.

MR Bill Scott, P.R.O. of **SOUTH SHIELDS AS**, reports that the Society were very pleased with the success of their recent Open Show, with nearly 500 entries of excellent quality with a lot of societies competing. Hartlepool AS 'cleared the decks' and were worthy winners. An event of great interest at the

## Lincoln Open Show Results

**BEST** fish in show at the **LINCOLN & DAS** Open Show held recently was a pink-cheeked barb entered by Mr Goldson (Lincoln). Remainder of the results:

Livebearers, Guppies: 1, D. & M. Laycock (Sheaf Valley); 2, Mr D. Caldwell (Scunthorpe); 3, H. & M. Buxton (Sheffield). Swordtails: 1, Mr Andron (Doncaster); 2, D. & M. Laycock; 3, Mr & Mrs Roberts (Doncaster). Mollies: 1, Mr J. Igoo (Sherwood); 2, Mrs Stephenson (Sherwood); 3, Mr & Mrs Blades (Crosswell). Platys: 1 & 2, D. & M. Laycock; 3, Mr & Mrs Daines. Small barbs: 1, Mr & Mrs Vickers (Doncaster); 2, Mr & Mrs Burton (Blackburn); 3, Mr E. Neville (Grantham). Large barbs: 1 & 2, Mr Goldson; 3, Mr & Mrs Blades. Small characins: 1, D. & M. Laycock; 2, Mr S. Walker (Grimsby & Cleethorpe); 3, Mr Jackson (Doncaster). Large characins: 1, Mr & Mrs Bailey (Sherwood); 2, Mr & Mrs Daines (Doncaster); 3, Mr M. Walkington (Bridlington). Killifish: 1, Mr T. Smith (Doncaster). Minnows & danios: 1, Mr & Mrs Stanton (Sheffield); 2, A. Kirk & Son (South Humber-side); 3, Mr & Mrs Emerson (Castleford). Sharks & loxes: 1, Mr Blundell; 2, Jackson & Bolder (Grimsby & Cleethorpe); 3, Mr & Mrs Stanton. Rasboras: 1, Mr Andron; 2, Mr Thorpe; 3, Mr & Mrs Stanton. Dwarf cichlids: 1 & 2, Mr & Mrs Binn (Scunthorpe); 3, Mr D. Underwood (Special AS). Large cichlids: 1, Mr & Mrs Sellars (Lincoln); 2, Mr T. E. Ingram (Special AS); 3, Mr & Mrs Blades. Angels:

1, Mr & Mrs Sellars; 2, Mr & Mrs Bailey (Sherwood); 3, A. Kirk & Son. Catfish: 1, Mr Blundell; 2, Mr B. Wessell (Scunthorpe); 3, Mr Goldson. Loaches: 1 & 3, Mr & Mrs A. Binn; 2, Mr J. Randall. Fighters: 1 & 3, Mr L. Smith (Castleford); 2, D. & M. Laycock. Anabantids: 1, Mr & Mrs Stanton; 2, Mr & Mrs Blades; 3, Mr & Mrs Simpson. aov Tropical: 1, Mr D. Caldwell; 2, Mr A. Feasey (Doncaster); 3, Mr & Mrs Guy (Doncaster).

Pairs egglayers: 1, Mr & Mrs R. T. Bull (Derby); 2, Mr D. Caldwell; 3, Mr Andron. Pairs livebearers: 1, Mr & Mrs Fletcher (Doncaster); 2, Mr & Mrs Daines; 3, Hughes & Walker, Junior egglayers; 1, Mr T. Senior (Lincoln); 2, Mr G. Allen (South Humber-side); 3, Master J. Emerson (Castleford). Junior livebearers: 1, A. Clarke; 2, A. Feasey (Doncaster); 3, Miss J. Cassell (Doncaster). Breeders egglayers 1-10: 1, Mr Armstrong (Grantham); 2, Mr Thorpe; 3, Mr T. Smith. Breeders egglayers 11-20: 1, Mrs Wells; 2, Mr & Mrs Fletcher; 3, Mr L. Smith. Breeders livebearers 1-10: 1, Mr A. Feasey; 2, Mr & Mrs Kilvington; 3, Mr Blundell. Breeders livebearers 11-20: 1, Mr & Mrs Kilvington. Novice: 1 & 2, Mrs D. Nicholson (Sherwood); 3, Master M. Bryant (Doncaster). av Marine fish: 1, Mr Fletcher; 2 & 3, Mr D. Caldwell. av Tropical female: 1, Mr & Mrs Kilvington; 2, Mr Jackson; 3, Mr & Mrs Stanton. Ladies class: 1, Mrs Copley; 2, Mrs P. Laycock (Sheaf Valley); 3, Mrs I. Simpson (Worksop). Goldfish and variants: 1, Mr & Mrs R. T. Bull; 2, Mrs Lilly (Bridlington); 3, Mr & Mrs Barlow (Grantham). Shubunkin & fancy goldfish: 1 & 2, Mr P. Robson (Bridlington); 3, Mrs J. E. Asquith (Castleford). Furnished tank: 1, Mr R. Fletcher.

Show was the first half of the 'twinning' ceremony with **BASINGSTOKE & DAS**, when scrolls were exchanged to mark the occasion. Eight Basingstoke members drove north to stay overnight in the homes of South Shields' aquarists and then twelve of the northern society journeyed to Basingstoke to complete the ceremony there. Mr Scott reports that South Shields members were impressed at the organisation of the Basingstoke Open Show, at the benching and the manner in which the hall was cleared for judging and hope to put into practice some of the ideas they gleaned.

SOME quick thinking on the part of Mr C. Skidmore saved the evening for **COVENTRY P & AS** when their evening programme had to be suddenly re-arranged owing to the non-arrival of a visiting club. By re-organising his quiz, all the members taking part had a thoroughly enjoyable and light-hearted evening. The eventual winner and recipient of the show tank prize was Mr S. Wooldridge. Table show classes were well supported. Winners were: av Barbs (13 entries), Mr A. Nash, best in

show; av catfish (6 entries), Mr J. C. Bailey; av rasbora (6 entries), B. & F. Hirst; av Characin (18 entries), Mr A. Simmons.

Recent club successes have included those won by Mr F. Hirst, Mr J. Wileman, Mr A. Simmons and Mr and Mrs F. Watts at the Loughborough Open Show. These included six firsts, two seconds, one third and two fourths and won for them the trophy for the Society with most entries.

## In Brief . . .

... **WORKSOP AQUARISTS & ZOOLOGICAL SOCIETY** are holding a mini Open Show on Friday, 6th September at Worksop Boys Club, Shaw Street, Worksop (opposite St John's Church). Benching 7.15-8.00 p.m. Schedules: Mr J. B. Clarke, 116 Lordens Hill, Dinnington, nr. Sheffield, Yorks.

... **GRIMSBY & CLEETHORPES AS** are having a stand at the town's Hobbies-for-All Exhibition where they hope to interest visitors in the art of fishkeeping. The Show is on 20th-22nd September at Cleethorpes Memorial Hall.



... A NEW society has been formed in Nottingham, the **BASFORD & DAS**, and anyone wishing to join will be most welcome. For the time being meetings are being held at the home of Mr and Mrs A. Moore, 2 Southglade Road, Bestwood Estate, Nottingham and secretary Mrs W. Smith, 4 Norman Street, Netherfield, Notts. can give further details. Chairman is Mr G. Guest.

... **HAMPSTEAD & DAS** regret that, for reasons beyond their control, they have had to cancel their Open Show. It was to have been held on 5th October and apologies are given for any inconvenience caused.

... IF any readers have trophies belonging to **BRACKNELL & DAS, DIDCOT AS** or **READING AS** will they please return them to Mr J. Horsey, 4 Rickmans Close, Woodley, Berks, in readiness for the Combined Open Show on 8th September at Reading University.

... **LINCOLN & DAS** will be holding a Bring and Buy Sale on Monday, 21st October at the Liberal Club, St Swithins Square, Lincoln at 7.30 p.m. Reserves accepted, 15% to the Society.

... 'BOG and Water Plants' was the title of the enjoyable illustrated lecture given by Mrs P. Whittington to members of **SOUTH PARK A.A.S.** The table show was judged by Mr G. King (GSGH) and class winners were: goldfish, Mr G. Herring; twintails, Mr G. Strutt; native and foreign, Mr R. Herman (look).

... **MEMBERS OF BRADFORD & DAS** are looking forward to a trip to Marineland at Morecambe on 17th September. A very detailed lecture by Mr Hemmingway of Batley on breeding the Celebes Island rainbow fish proved very instructive and interesting. The table show for aov cichlids was won by an angel fish entered by Mr R. Hainsworth. Pressure of work has caused secretary Mr A. Pirth to resign from the office. Mr D. H. Edmondson (11 Valley Court, Liversedge, Yorks.) has taken over for the rest of the year.

... **BOURNEMOUTH AS** members enjoyed an interesting evening when secretary Mr R. Matley showed slides while the chairman put questions about the various fish shown—it proved most helpful to

new members. At this meeting members also decided on a club badge.

... **LOTS** of attractions are planned by **TORBAY AS** for their sixth Open Show to be held at Torquay Town Hall on Sunday, 22nd September. These include a display by the South Western Herpetological Society of crocodiles, snakes, giant frogs and lizards. Other items to make this show 'The Best in the West' will, it is hoped, include demonstrations on making fishing flies, floral arranging and displays by the Devon Beekeepers Association and the Cacti & Succulent Society. Entries for the Show not later than 12 noon please.

... **ABINGDON AS** now has a steadily growing attendance with new members at almost every meeting for the past few months—hopefully, interested persons will continue to attend. The July table show was well supported with 20 entries and it has been decided to hold a show at the last meeting in every month in future. Two members are busy improving their fish photography and the Society hope to have two slide shows, possibly with tape commentary, to loan to other societies.

... **THE** older generation of **BRISTOL AS** have given a most entertaining series of short talks on how they became members of the Society, describing how much the equipment and various other aspects of the hobby has changed since the early 1930s. Table show results were: Shubunkins: 1 & 2, Mr R. Pinnock; Veiltails: 1, Mr R. Pinnock; Barbs: 1, Miss Morgan; 2 & 3, Mr W. Hann; Loaches: 1, Miss Morgan; Catfish: 1, 2 & 3, Miss Morgan. Judges for the table show were: Mr G. Bell, coldwater, and Mr E. Bowden, tropical.

... **MR** Bob Brown, reporting on the activities of the **AQUARIUM SOCIETY OF VICTORIA, AUSTRALIA** in their publication **FENCIAT** reports: 'Mr Bruce Garratt, just back from a trip to England, presented me with booklets of show standards of Tropical fish and Aquatic plants, plus listings of show sizes of 1025 species of tropicals. These are the Federation of British Aquatic Societies' publications and are being studied very intently. I feel they could become the basis of our judging standards, particularly

when the extended table show is in operation. The judges' sheet is good, and with a little revamping could suit our needs admirably. I will be presenting a precis of these as soon as possible.'

... **PETERBOROUGH AS** greatly enjoyed the excellent talk and slide show given by Mr E. A. Allen, on kei and building a kot pond. Mr K. M. Fox won the table show, open av class (2, Mr C. A. Reales; 3, Mr R. Fairchild). The Association is now a member of the Federation of British Aquatic Societies.

... **MEMBERS OF MID-SUSSEX AS** have taken to heart the talk by Mr J. Bartles on local marine life and how to collect aquarium specimens by holding their August meeting on the beach at Saldean. The Society are also arranging a display tank of local marine life at the Booth Museum, Brighton.

... **IN** their KAAS League match against **ERITH & DAS, SITTINGBOURNE & DAS** won in two of the three classes but unfortunately lost the third class by such a margin that Erith finally took the match. The lecture by Mr J. Welling on 'Chemistry in the Aquarium' was much enjoyed. Mr B. Clare of Medway judged the table show class for the Swordtail Cup, first placing going to Mr B. Newman. The play class, judge Mrs A. McDonald, was won by Mr P. Floyd.

... **LOUGHBOROUGH & DAS** is holding a members' Furnished Aquaria Competition in the form of a public display in aid of the John Storer House Foundation. The tanks will be on display from 14th to 16th November at the John Storer House, Wards End, Loughborough.

... **SHOW** Rules were under discussion when the **ASSOCIATION OF GOLDFISH BREEDERS** met in June. Mr H. Bence won in the table show class for twintails.

... **TWO** teams of members worked hard at the quiz held by **NEW FOREST AS** recently. Mr Leavey was the organiser and the teams had a total of 90 questions to answer. At the end there was a difference of only six points between the teams. Mrs V. Leavey judged the table show. The fancy coldwater class was won by Mr D. Harding, who received the Cup for twintail fish and Mr L. Menhennet won first, second and third places in aov coldwater.

## Dates for Your Diary

1st September. **NEWBURY & DAS** 2nd Open Show, The Plaza, Market Place, Newbury, Berks. Schedules: Mr G. Foster, 19 Jubilee Road, Newbury, Berks.

1st September. **BETHNAL GREEN** AS Open Show, The Institute, 229 Bethnal Green Road, London, E2. FBAS Supreme Championship class W (2000 goldfishes).

1st September. **PETERLEE & DAS** Open Show, Schedules: Mr Bebbington, 40 Marlborough Road, Hastings Hill, Sunderland, Co. Durham.

1st September. **WELLINGBOROUGH & DAS** Open Show, Queensway Hall, Goldsmiths Road, Wellingborough, Northants. Schedules: Mr P. Wallis, 12 Cherry Walk, Ransall, Northants.

6th September. **WORKSHOP AQUARIETS & ZOOLOGICAL SOCIETY** 2nd Open Show, Workshop Bays Club, Shore Street, Workington (opposite St. John's Church). Running 7.15-8.00 p.m. Schedules: Mr J. B. Clark, 116 Lindson Hill, Donnington, nr. Sheffield, Yorks.

7th September. **FRAN ASSEMBLY**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

7th September. **GOLDFISH SOCIETY OF GREAT BRITAIN** Open Show, Sutton Adult School, Bechford Road, Sutton, Surrey. All exhibitors welcome. Schedules: Mrs. M. Duffley, 183 South Park Road, Woburn, London, SW19 8RN.

8th September. **HARLOW** AS Open Show Mount House, The Stew, Harlow. Schedules: Mr P. Marsden, 21 Brook Lane Field, Harlow, Essex.

8th September. **BEACONHILL, DEKOT & READING** AS Combined Open Show Students Union, Reading University, Details: Mr J. Hoare, 4 Rickman Ct. e, Woodley, Reading, Berks, RG5 1H; phone Reading 66617.

8th September. **CLEVELAND** AS Open Show, Details: Mr B. Welford, 1 Railway Terrace, North Skeaton, Southorn, Yorks.

8th September. **HOVLAKI** AS Open Show, Hovlaka FMCA, Hovlaka, Schedules: Mr D. Manton, 30 Cable Road, Hovlaka, Merseyside, Wirral.

10th-11th September. **BRISTOL** AS Open Show, Bishopston Parish Hall, Details: Mr T. Rowden, 12 Stonehill Walk, Knowle, Bristol BS4 2RL.

14th-15th September. **LITTLEHAMPTON & BOGNOR** AS Annual Exhibition, The Marquee, Bognor Regis. Open to public from 10.00. Free admission (open 12 noon Sunday).

14th September. **BOUNDSLOW & DAS** Open Show, Youth Centre, Coal Road, Bournemouth. Details: Show secretary, Mr H. Pratt, 25 Woodson Drive, Feltham, Middlesex; phone 01-894 0923.

15th September. **NEILSON** AS Open Show, Civic Centre, Stanley Street, Nelson, Lancs. Details: Mr H. Hingworth, 94 Barrowfield Road, Colne, Lancs.

15th September. **SOUTH LEEDS** AS Open Show, The Corn Exchange, Leeds 1. Schedules: Mr D. Gifford, 3 Burton Mount, Leeds 11, LS1 8TS.

21st September. **EAST LONDON A & PA** Open Show, Ripple Road School,

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Ripple Road, Barking, Essex. Details: Mr F. Vicker, 13 Irons Way, Rye, East Sussex.

22nd September. **BLYTON & DAS** Open Show, Pavilion Gardens, Blyton, Schedules: Mr A. Holland, 8 Midland Terrace, New Mills, via Stockport, Cheshire.

22nd September. **HASTINGS & ST. LEONARDS** AS Open Show, St. Clements Church Hall, Cliff Road, Hastings. Enquiries: Mr M. Pyndel, 44 St. Marys Road, Hastings, Sussex.

22nd September. **TORRIS** AS Open Show, Torquay Town Hall, Schedules: Mr J. R. Davis, 43 Haldon Road, Torquay, Devon.

26th September. **HENDON & DAS** Open Show, Henry Barden Hall, Hendon, London NW4. Schedules: Mr H. Watts, 49 Selborne Gardens, Hendon, London, NW4.

26th September. **GRIMWOOD** AS Open Show, St. Marys Church, Grimwood, Essex. Details: Mr H. Atherton, 232 Orendark Road, Uptonwood Moor, Malmesbury, Wiltshire; phone Malmesbury 24795.

29th September. **BUCKNALL & BULWELL** AS Open Show, Details to follow.

29th September. **CHESTERFIELD & DAS** Open Show, City Cross Social Centre, Chesterfield Road, City Cross, Chesterfield, Derbyshire. Details: Mr J. Tomlinson, 16 Beadworthy Drive, Wingerworth, Chesterfield, S42 6SA.

1st October. **HAMPSTEAD & DAS** Open Show, Blackfriars Hall, The Priory, Southampton Road, London SW3. Details: Mr T. Woolley, 20 Caprinus Close, N. Cauxley, phone 01-268 4878.

5th October. **CARDIFF** AS Open Show, St. Margaret's Church Hall, South, Cardiff. Details: Mr C. Turner, 146 Arras Street, South, Cardiff.

6th October. **FARNLEY & DAS** Open Show, Greenford Community Centre, Oldfield Lane, Greenford, Middlesex. Details: Mr T. A. Crickbank, 82 Maple Avenue, Greenford, Middlesex; phone 01-578 0168.

6th October. **NEWCASTLE GUPPY & LIVEBEARER SOCIETY** All-Overseas Open Show, Civic Hall, Gosforth, Newcastle upon Tyne. Schedules: Mrs J. Rawson, 124 Dunstan Tower, Gosforth, Newcastle upon Tyne, NE12 0TX.

6th October. **VAUXHALL MOTORS RECREATION CLUB AQUARIST SECTION** Open Show, Details: Mr A. D.

Phillips, 15 Hollybush Road, Luton, Beds, LU2 9HG.

20th October. **SHERWOOD** AS Open Show, Thursday, Miners Welfare Hall, Edwinstowe, Glean, nr. Mansfield, North. Schedules: Mr J. Igoe, 25 Marple Avenue, Mansfield Woodhouse, North; phone Mansfield 32248.

25th-27th October. **THE AQUARIUM SHOW '74** at the Royal Horticultural Society's Old Hall, Vincent Square, London SW1. Presented by the Federation of British Aquatic Societies. Aquarist Society fishkeeping exhibits invited. Details from the organisers, PFM, 554 Garratt Lane, London SW17 0NY; phone 01-947 2805.

26th-27th October. **THE IRISH TROPICAL FISH SOCIETY** 2nd Open Show, The Mission House, Dawson Street, Dublin 2. Schedules: Mr J. P. Nalamin, Kilgallon, Sarsfield, Co. Dublin.

27th October. **DONCASTER & DAS** Open Show, Broadacre, Manton, Walford, Walford Road, Woodlands.

2nd November. **GMGB** General Meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

10th November. **HALIFAX** AS Open Show, The Forum, Cottage Community Centre, Conis Lane, Ilkley, Halifax. Details: Mr D. Skelton, Coltham, Gosport, Kings Cross, Halifax; phone Halifax 66118.

10th November. **WALTHAMSTOW & DAS** Open Show, Details to follow.

3rd November. **BLACKBURN AQUARIST WATERLIFE SOCIETY** Open Show, Winson Hall, Blackburn. Details: Mr B. Marshburn, 19 Hawthorn Crescent, Farnhill Hill, Gifford, Lancs.

14th-15th November. **LOUGHBOROUGH & DAS** Exhibition (members' tanks), John Street House, Wards End, Loughborough (in aid of the John Street Home Foundation).

17th November. **BRADFORD & DAS** 25th Open Show, East Bowling Unity Club, Leicestershire Street, Wakefield Road, Bradford. Details: Mr E. J. Brown, 8 Garden Field, Wake, Bradford; phone Bradford 67777.

1st December. **HORNFORTH** AS Open Show, New Civic Hall, Manningley Road, Pudsey.

7th December. **FRAN ASSEMBLY**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

## Meetings and Changes of Officers

**ABERDEEN** AS. President, Mr R. McPherson; vice-president, Mr D. Strachan; secretary, Mr R. Baxter (29 Colville Circle, Millburn, Aberdeen); phone Aberdeen 732511; treasurer, Mr J. Riddell; show manager, Mr G. C. Robertson.

**BARNFORD & DAS**. New Society. Chairman, Mr G. Good; secretary, Mrs W. Smith (4 Nettleton Street, Northampton, Northants). **BRADFORD & DAS**. New Secretary, Mr D. H. Edmondson (11 Valley Court, Liverdale, Yorks.).

**BRITISH KOL-KEEPERS SOCIETY**. General Secretary, Mr A. J. Ballou, 1120 Ashburton Avenue, Severt Kings, Herts, Essex. RD 9EL. Membership secretary, Mr D. C. Davis (137 Garfield Avenue, Whitmore Village, Bovingdon Hill, Bucks.). **GOSPORT & DAS**. Chairman, Mr T. Perry; treasurer, Mrs P. Jupp; show manager, Mr M. Carr; show secretary, Mr I. Clarke (37 Rowler Close, Gosport, Hants.); secretary, Mrs K. Howell (34 Long Drive, Birtwinston, Gosport, Hants.); phone Fareham 96180.



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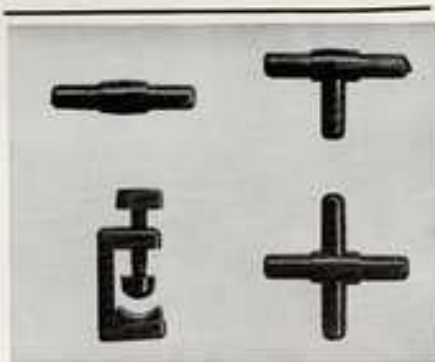


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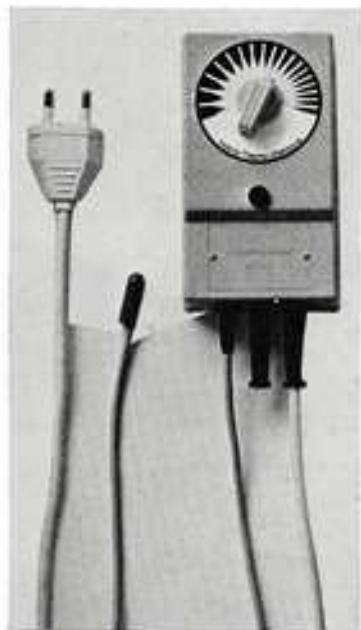
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