

MARCH 1971

15p

Pet Fish

monthly

The PRACTICAL FISHKEEPING MAGAZINE



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The Albino Guppy

Breeding Goldfish in Tanks

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Comments and Quotes

- Neglect of the goldfish
- All that live in water

The Cold Front

WE had rather expected something in the nature of a violent reaction to Mr T. L. Dodge's article, printed in the December issue of 1970, on the current state of the coldwater hobby. Perhaps the coldwater hobbyists' torpid winter state coupled with the postal strike has been responsible for the terrifying hush. Even if all of Les Dodge's comments were acceptable to everyone, surely there should still have been some enthusiasm registered for his plea for a boost in the coldwater field! "The remedy is in our own hands", wrote Mr Dodge. Do we hear shouts of "Yes, yes!—let's get on with it!"? We do not, and we suspect that by the time their hibernation state has passed the few who might have reacted will all be too busy with their spring and summer spawning priorities.

It is rather sad that the goldfish, which must, strangely enough, be the cause of more people taking up tropical fishkeeping than any other single factor, is itself so neglected. Neglected, that is, in the serious hobbyists' sense of the word. After all, pondkeeping is still a very prominent garden activity in this country, and with the advent of prefabricated garden pools one that has grown quite a lot. But the great majority of pond-owners are keeping goldfish only as decorative additions to their garden scene. Amongst their thousands, however, must be quite a few who are potential material to be excited into action by the right kind of approach from the loyal goldfish devotees. Somehow their potential interest must be caught and developed; somehow they must be made aware of what has been responsible

for maintaining the enthusiasm of the faithful few throughout the years. Most important, leaders in the coldwater field should wake up to the fact that, as Mr Dodge says: "We're losing 'em quicker than we're picking 'em up".

When is a Fish?

'FISHES, birds and animals.' Hands up, class, what's wrong with that phrase? Quite right, Smith junior, it's illogical. If fishes and birds are not animals, what are they: plants, minerals?

Not a very important matter but the phrase is too often seen in popular writings, and used by those who should know better. It's a bit of archaism we were reminded of by the sight of a news item about the 'Fishes Royal', which, since a statute of 1324, have been accepted to be whales, dolphins and sturgeons, animals that are, of course, from two distinct natural groups. In early times anything that lived in water was called a fish, but aquarists should be careful to use the word in accordance with modern classification, if for no other reason than the one that show secretaries could find themselves in trouble with some rather peculiar entries in a.o.s. classes!

It seems that the Queen is to lose her traditional right in the 'Fishes Royal' as a result of the tidying up of the Statute Books, but it is noteworthy that shore-stranded whales and dolphins will continue to be reported, for the benefit of zoologists. A vast amount has been learnt about cetaceans generally as a result of specimens being available for study in this way. Class dismiss—sturgeons are yours for the taking.



LETTERS

Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London S.W.17

No Spares

HOWEVER nice it is to have such a wide range of equipment in fishkeeping I do wish things didn't become obsolete so quickly. It's mostly the foreign firms that appear to be the trouble but it seems to me that if one buys a fairly expensive pump it ought to be possible to buy parts for it only 2 or 3 years later. I have been quite unable to get replacement diaphragms for two continental aerators, both very good pumps but now seemingly permanently out of service. There seem to be too many things to choose from so that half the items are not marketed properly.

Clacton, Essex

J. BUBBERRY

Air the Hard Way

DURING the power cuts I was amused to find that I still had, amongst my junk, an old 'aerator' made from a steel drum with a valve for a hand pump to be attached. I fetched it out for emergency use (I didn't have to use it, as it happened), but I must say the sight of it and thoughts of trying to make it work made me thankful for the fine air pumps available to us today.

London, N.W.2

V. MERSTON

Aqua TV

GOOD Heavens! TV sets appear to be essential items of the U.S. fishkeeper's fish house if the ones Mr Malcolm Delingpole describes (PFM, January) are anything to go by. Surely the next step must be the introduction of miniature waterproof TV sets that can actually go in the aquarium! Should I get a patent out for this?

Vardley, Birmingham

L. STEERS

Beginner with Marines

FOR some time I have been interested in marines (tropical) but because of the 'ifs' and 'buts' connected with it, I should like to start on a tropical marine no-fish set up, or at least keep only seahorses in the tank together with living coral, anemones, etc. Because of the difficulties that are likely to arise with marines, I feel that two heads are better than one (even if they be sheep's heads, as the saying goes) and then if things go wrong, it is better to have a companion in trouble.

I am prepared to set up a 3 ft. tank (at my expense, of course) and would be very pleased to hear from anyone living near me who would be interested in joining me to help in the project.

I would like to see more letters and articles on marines in PFM please.

Southall, Middx.

GEORGE OSBORN

We shall be pleased to pass on names and addresses to Mr Osborn.—EDITOR.

Emergency Measures

POWER cuts brought out an interesting aspect of fishkeeping in that the temporary loss of electricity obviously caused more worry for aquarium owners from the stoppage of their aerators and filters than by the loss of heat. As you pointed out in Comments and Quotes (PFM, January) there are ways of delaying falls in temperature and alternative methods of heating but nothing is readily available to give a source of air. Perhaps there is a market for battery-operated aerators for emergency use, but also it might be asked whether we have become too dependent on filters and aerators for ordinary fishkeeping? They are essential for dealers' tanks but not for the properly maintained community aquarium.

Coventry, Warks.

R. GOBLING

When Guppies Have to Go

PETER UNWIN asks (PFM, January) what Guppy World readers think about the Singapore note that weakling and sick guppies are 'flushed down the sewer'. I assume he would accept that anyone following a breeding programme must cull his stocks and be quite ruthless about this. Tank space alone will dictate this action. Given that fact what is one to do with the culled fish? Correspondence in PFM last year showed that there isn't much of a market (if any) for unwanted guppies and it really seems that unless one nourishes a few cichlids on them our Singapore friend's disposal technique is as practical and merciful as any.

Headington, Oxford

I. PERCY

Marine Clinics

I AM glad Arpee (PFM, January) raised the question of what 'clinical cleanliness' means with reference to marine fishkeeping. As a hospital worker I think I know something about what conditions this phrase really implies and they could not, of course, ever be reached practically with a marine tank. However, I think I also know what mariners are trying to indicate when advocating 'clinical cleanliness', which is the adoption of techniques to ensure that the tank manager has complete control over all that goes into or can affect his aquarium, and the development of an awareness that not only things that can be seen but also microscopic and chemical factors can have important effects on his tanks' well-being. Such techniques are largely a matter of common sense and not acting carelessly in tank maintenance. Let's drop the 'clinical' description—it should be enough to say 'cleanliness' or 'strict cleanliness' and avoid the notion that only some kind of rubber-booted, rubber-gloved, masked and begowned aquatic surgeon can be a marine fishkeeper.

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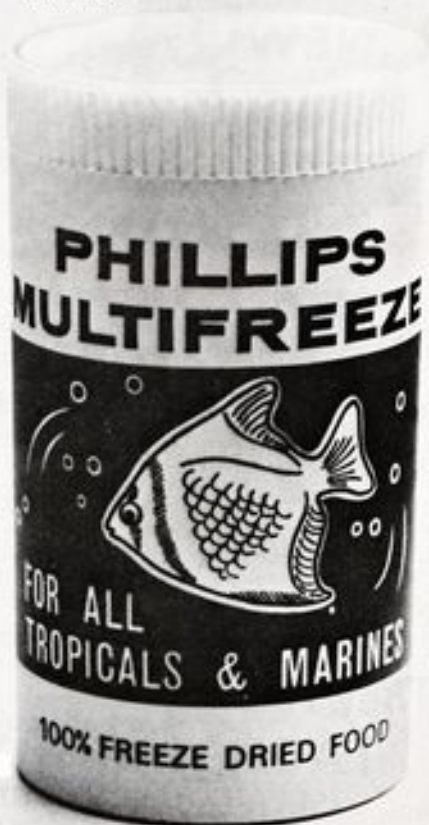
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Lake Tanganyika Cichlids

By STEVE FORSTER

CICHLIDS of the genus *Julidochromis* occur in Lake Tanganyika, and although there has been great difficulty in establishing the separate species within the genus it is now thought to contain five separate species: *J. marlieri*; *J. ornatus*; *J. regani*; *J. transcriptum* (or *transcriptus*); *J. sp. nota*. Although species were first listed in 1898, few specimens were seen outside Africa until the middle of the sixties, but even now these fishes cannot be described as freely available. Four of

the five species have been scientifically listed with the details shown here.

All species of *Julidochromis* seem to grow no larger than 8 cm. and it has been established that all flourish on a diet containing algae or algae-based foods. To house fishes of this genus in ideal conditions one should

give some thought to their native habitat.

They are found in the shallow waters of Lake Tanganyika, where they rarely venture from the protection of the rock formations in which they live. An aquarium housing any julies should therefore contain slightly hard water, be liberally furnished with rockwork, be placed in a situation where the growth of algae will be promoted and finally, but of most importance, have a base covered with a good layer of sand or fine gravel. The reason for the sand is that all the fishes in the genus dig underneath a rock to create a cave for themselves.

J. sp. nota have been bred in South Africa and this species is the one for which more than a guess can be made at sexual characteristics. It has been noted after careful observation that the males swim with their dorsal fins erect while the female darts about with her dorsal held flat against the back.

Courting and pre-spawning behaviour is similar to that of other cichlids and males are often seen locked mouth to mouth. Again, as with other cichlids, natural selection seems to be the best way of obtaining compatible pairs. The spawning procedure of *J. sp. nota* and *J. ornatus* seems to be identical and it may therefore be assumed that the others of the genus will reproduce in like manner. After a pair have accepted each other the presence of other fish is no longer tolerated and if there are other specimens in the tank they should be removed.

In all the spawnings of *J. sp. nota* that have now been recorded in South Africa, and on the three occasions I have had *J. ornatus* reproduce, the eggs were never seen. From the positions noted during spawning it seems likely that the female turns upside down and lays the eggs on the underside of a rock. As the spawnings usually take place in one of the excavated caves it is impossible to determine what is actually taking place.

I recently found a specimen of *J. transcriptum* with two fry in his or her mouth, but whether this species is a mouthbrooder or merely affords

The 'Julies'

Julidochromis regani (Poll 1942)

The basic body colour of this species is cream with reddish overtones. The body is horizontally marked with four dark lines, one of which runs through the eye. These dark bands vary in colour intensity depending on the environment and condition of the fish. The markings are most defined when the fish are fed on live foods and algae-based preparations, or when they feel secure in their surroundings. When the fish are frightened or in poor condition the markings fade until almost indistinguishable. *J. regani* also displays a band running along the dorsal fin and has an elongated black ray on the anal fin. The caudal fin is decorated with a solitary black spot at the base of the tail and the gill plates are also edged with black.

Julidochromis marlieri (Poll 1956)

A dark-brown body coloration marked with rows of white spots, which form a pattern of four vertical and nine horizontal bands. The anal, dorsal and ventral fins are peppered with irregular rows of light dots. This species and *J. sp. nota* are almost identical and it is with these two species that most controversy arises. Although the pattern and colour of the body markings is very similar, on *J. sp. nota* the marking extends only to the middle whereas on *J. marlieri* the whole body is patterned. Another difference is that *J. sp. nota* specimens show light markings only on the edge of the dorsal fin whereas the dorsal of *marlieri* is totally mottled.

Julidochromis ornatus (Boulenger 1898)

The basic colour of this species is yellow/white and is traversed by three distinct dark-brown bands running from the tip of the snout to the base of the tail fin. The dorsal fin is dark brown on top but darkens into black where it joins the body. The anal and caudal fins are almost colourless but both are edged with black.

Julidochromis transcriptum (Matthes 1959)

The body coloration of *J. transcriptum* is dark brown with four or five vertical white stripes on the lower half of the body. The ventral fins are black as is the anal fin. Some specimens show white spots on the anal fin and others do not. This is not a sexual distinction. A white stripe runs from the upper jaw across the eye and on to the gill covers. The head is marked with small white dots.

oral protection is a matter of conjecture. One thing that is certain about the genus is the broods are disappointingly small, usually numbering about 10. On rare occasions 15 fry are recorded but this figure is more than offset by the more regular

appearance of less than six. In South Africa pairs of *J. sp. rosea* have been seen apparently fighting over the right to protect the solitary fry produced by their union.

The fry browse continually on algae-covered rocks but will also

accept live brine shrimps. Parent fish have also been observed chewing up tubifex for fry. A peculiarity of *J. sp. rosea* is that they show a preference for prepared foods over live foods, which is almost unique amongst cichlids.

Planning a Breeding Programme

By F. W. COLES

ONE of the reasons why there is so much close breeding in tropicals is, of course, the limited tank capacity of most aquarists. There is a general consensus of opinion amongst breeders that a considerable deterioration has taken place in recent years, particularly amongst livebearers, which nowadays have not the size or indeed the coloration of the varieties in the past. This is assumed to be due to inbreeding, but I think it is due to indiscriminate breeding. Inbreeding, if properly carried out, can be beneficial, but indiscriminate inbreeding is usually disastrous.

Well then, how many tanks are necessary for a programme of line breeding? I will leave out inbreeding for the moment, although it can be carried on with the same number of tanks, or less, than a programme of line breeding. Assuming therefore that we use the smallest number of fish possible for breeding (only the best are suitable for carrying on the strain and also there can be only one best male and one best female in each batch), let us say we commence with just the best unrelated male and female livebearer we can obtain.

First it will be necessary to keep this pair of fish together and let the female produce her first brood. These can be discarded, as there is no surety that the selected male is the parent, but in the next brood the probability is that 85% will be descended from the male swimming with her.

We need one tank for the parents then, and a further two tanks for the first progeny to be kept. These must be separated into male and female before the males become capable of breeding. This is imperative, and must always be carried out in any system of breeding. So we have three tanks in operation.

It is necessary for the youngsters to grow to a respectable size before sorting out the parents for your next batch. This is necessary on two grounds: (1) larger parents produce larger offspring, and (2) some varieties need to be at least three-quarters grown before evaluation of their possibilities can be made. As there has been only one generation produced up to now, it is not yet necessary to keep second best selections for insurance against loss, but this will be essential as the programme proceeds.

Assuming that we grow on the youngsters to breedable and selectable size, the next step is to select the best male from one tank and the best female from the other—no more. There is only one best, and anything less is of

no use to us. This needs a man with a sense of proportion, an analytical mind—what the gardeners call green-fingers, what other people call 'nous'. All the factors need evaluation, and in breeding it is best to have certain priorities, say, size, colour, finnage, etc., in whatever order you prefer and consistent with what you are trying to do.

The accepted thing is then to mate the daughter back to the father, and the son back to the mother. In some species this is difficult to do, as they may not have sufficient longevity to enable this to happen—particularly with the female parent, as her next brood will have to be scrapped to make sure that her son is definitely the parent of the ensuing one. But, not to complicate things too much, let us assume that this can be done.

We are now back to two tanks, you will have noticed, but as the best fish of the remainder of the stock will have to be kept for the present, just in case of fatalities, we really need four.

Assuming that our programme proceeds smoothly, when the first broods of the new matings are produced we can discard the ones kept for insurance, and we need those tanks to bring up the youngsters, plus another two tanks when they need separating. So we then have six tanks in operation.

The original parents of our youngsters can now be scrapped, but in future we will need the tanks for our next parents. The next procedure is to select the best male and female from one set and mate them to the best female and male of the other set, so we still have our six tanks in operation.

The next step usually brings in an outcross to one of the lines, and then these are cross-mated again as above, so you will see we cannot reduce the number of tanks, and as we usually keep one or two for showing, at least another tank is necessary.

This may seem to be extravagant, but as some tanks can be small, e.g. for pairs of fish, even 2 ft. tanks can be divided, and it is, of course, possible to keep other compatible fishes in some of the tanks provided that they cannot interbreed.

It does seem, however, that any really constructive course of breeding can only be carried out with a separate room or fish house available, and that community tanks can have a lot to answer for if one looks under the surface!



Personal COMMENT by ARPEE

FOR several years past I have been depressed by the mounting death rate amongst the fish in my pond and I therefore made a resolution last year that I would restock it and take every reasonable step to maintain it in a healthy condition in future. The causes of my past failures were not difficult to determine.

Principally, the decomposition of leaves from nearby trees, coupled with decaying aquatic vegetation, had produced gases when the pond surface had frozen over in winter, and this had regularly taken toll of the inmates. I had tried most of the recommended remedies, from floating spars of wood to beach balls, but prolonged cold spells usually saw the breakdown of such rule-of-thumb methods, and I had to revert to the production of air-holes via the medium of the kettle of boiling water. The pond is too far from the house to run a tubular heater economically so I have had to continue to run some of the risks of the traditional methods.

The ogres amongst FFS readers will broaden their grins when I confess that there are two large laburnum trees within leaf drop of the pool, and of course the wretched seeds pour into it regularly, season after season. Theoretically no creature could live in such a basinful of poison but some fishes have survived for years and the frog, newt and toad invasion occurs annually and apparently successfully—if the resultant tadpoles are anything to go by. Nevertheless I reduced these fine trees to mere 6-footers and I hope to train subsequent growth into satisfying shapes, since Fred Loads reckons that you can train a laburnum to do almost anything. The covering of the pool towards autumn with fine mesh plastic netting, together with the denial of such heavy doses of the poison cytsine should contribute some improvement.

Disease, as such, has never worried my pond fishes very much, though there are some signs of fungus after the annual great awakening, and this disappears quite quickly when stamina builds up after a few feedings of earthworm. The most curious disease we have encountered occurred 2 years ago when every golden orfe succumbed to a mysterious eye complaint. Each fish gradually became blind—the eyes turned completely white—and no treatment appeared to have any beneficial effect. Other species, including golden rudd, were completely unscathed, so I am rather shy of orfe for the time being.

Plant life is normally very vigorous and last season was no exception, with the result that severe pruning of many of the marginals had become necessary. Long-handled garden shears and a tree pruner enabled me to reduce the water mint, spearwort and rush plantation to manageable proportions and to provide clearer swimways for the fish. An enormous build-up of duckweed was also threatening and this was tempered by the strategic wielding of a

long-handled fine mesh fishing net. One of the oddest consequences of the winter was the virtual disappearance of 'crispa', which has been so prolific year after year. It has been reduced to wispy, sickly-looking fragments and will take a long time to improve. I wonder whether this shortage of crispa has been repeated elsewhere?

There seems to be a good and rising bed of hornwort and the myriophyllum is about average, which indicates that there was nothing fundamentally amiss with the water in terms of pollution. After a few days of sunshine the water went through its usual colourful gyrations and then became crystal clear. We had to make several skimmings for duckweed and for bits of algae and other oddments which always come to the surface with rising temperatures, but at last everything seemed ready for the introduction of some new fish. Apart from a few small goldfish and shubunkins we only possessed three large golden rudd and two common rudd that I caught two seasons ago in a neighbouring waterhole.

The selections of coldwater pond fishes at local retailers fairly made my hair stand on end when at last I looked over their stocks with a view to buying some shubunkins and possibly hi-go. Hollow bellies, torn fins and awkwardly shimmying creatures met my gaze and I put off buying anything until first-class stock became available. For some odd reason some fine fish finally arrived quite late in the season and I managed to make a reasonable choice from them. The best fish were in the monster class but I avoided the temptation because I find they rarely last long; in practice it is better to buy small fish and let them grow to the size your pool can support than to buy the ones you think it can support. Fishermen always tend to be over-optimistic when it comes to sizes!

Two things made it a quite memorable pond season. The first was the first sighting, after the winter rest, of our single home-produced golden rudd, of whom we are inordinately proud. He is now 3 inches long and shoals with his parents. He is somehow the living proof of the triumph of our pond fishes over the adversity which constantly besets them! Our other auspicious moment was the discovery that we had some palmate newts in one of the smaller ponds. These are charming little creatures, somehow more delicate and appealing than the common and the great crested, and their discovery completes a long and frustrating hunt which began when I lived near Epping Forest, whose ponds were quite unyielding on this point.



Aphyocaranax rubripinnis is the excruciating name given by science to one of the most attractive and easy-going of the tropical egg-layers, and anyone who ordinarily refers to it other than by its popular name of bloodfin may be classed as either a pedant or a snob. Neither of these epithets would ever apply to this great little fish because it is as perky and ubiquitous as a sparrow and distinguished for its lack of pretentiousness. Its only preference seems to be for hard, alkaline water, which is a feature it has in common with the zebra danio. It is otherwise no more demanding than this other very popular species, but somehow it seems to find its way into aquaria far less

often than it has every right to. It could be that irregularity of imports prevents it from being continuously in the public eye, and it therefore gets absorbed by the buyer only spasmodically. Since it is difficult to plan an intake of species which fluctuate in supply, collectors do rather tend to fill vacancies caused by death by more readily available fish.

The bloodfin in my experience falls into this category and I have consequently kept far fewer of them than I would have liked. A further reason for their erratic appearances is their breeding performance, which makes it unlikely that amateurs will ever have very many surplus to bridge the supply gaps. The experts vary rather widely in their advice to keepers of this fish. Some suggest alkaline water, some suggest slightly acid. Some will have them breed in the fashion of zebras—a shallow tank with marbles on the bottom, whilst others favour a mass ceremony in a tank crammed with threadlike vegetation to act as egg traps. Some aver that the fry are easy to raise and others point to their smallness as a serious difficulty in achieving any sort of success.

I have read between the lines in classing this fish as a slightly difficult breeder, which might be a worthwhile exercise in patience for the egg-layer enthusiast who thinks the whole process is all too easy. I have certainly had lots of spawnings from these fish under community conditions, but of course the eggs have always been eaten by the parents and the other inmates. I would guess that raising the fry is the major problem, with the first day or so after free swimming being the most critical period.

Temperamentally the bloodfin really does seem to have a wide range of tolerance, both from the point of view of water quality and from that of temperature. Its food presents no problems at all and it takes to the tin and tubifex with equal relish, and as a community fish it shows up exceedingly well. Its greyish blue body contrasts beautifully with its red fins and since it rarely gets much bigger than 2 inches it falls into the middle size grouping. Ostensibly it is a surface swimmer, and if you only keep the fish in ones and twos you may find them

spending most of their time there but if you can put a number together they will form tangible shoals and range through all water levels, and this means that they will be seen to better advantage.

They are extremely busy fish, with a conscientiously enquiring air about them. They earnestly investigate nooks and crannies and all the other things fish poke into, and never seem to tire of the quest for the unusual. The zebra, by contrast, goes through much the same sort of routine, but in a contemptuous and rather arrogant manner which can prove somewhat irritating. The bloodfin's incessant activity seldom jars, particularly when a shoal is on the move. It revels in its own company and, like other fish which move in groups, displays better colour in those circumstances than when isolated or in twos and threes.

It is normally thought proper to plant a tank for fish as delicate as these with such as myriophyllum or cabomba, but I personally favour giving them a lot of open swimming space in order that they can be seen and I prefer thickets of such as Vallisneria or Sagittaria. If you use the latter you can, of course, use the dwarf variety to great purpose as a foil to the larger plants.

I am more inclined to recommend this species as a shoal fish for a community tank than as a candidate for a tank on its own. After all, it mixes so well and contrasts so well with other species that it is a pity to pass the opportunity by. In isolation it seems less splendid than it really is, and requires something a little more garish to set it off to best effect.

I have not found the bloodfin to be one of the longest lived species I have ever kept, even though I have always bought them at a little under an inch in size. It makes one wonder whether there is anything in the theory that the quickest and most constantly moving creatures wear themselves out more quickly than those which are slothful. In Man this is almost certainly true, and I think there is a distinct tendency towards this so far as fishes are concerned. True or not you get a lot for your three and sixpence every time you buy a bloodfin, but don't forget that they come better in the biggest packets!

Transatlantic TOPICS

IT isn't only beer and biscuits that can be kept in barrels; now we can add yet another 'B'—bettas. Tested and approved by Marineland of the Pacific Laboratories, these 'Betta Barrels' are 18 in. long, clear plastic tubes in two diameters—3 in. or 6 in. They are designed for the keeping of one or more fighting fish in a community aquarium without impairing the beauty of the tank, each occupant being provided with a hospitable place to live.

Exchange of water is effected by means of small holes pierced in the sides of the barrels. By using six 6 in. and twelve 3 in. tubes, 24 *Betta splendens* can be accommodated, safely isolated, in one 10 gallon (15 in. high) set-up. The smaller tubes fit

By JIM KELLY

inside the larger, two smaller tubes inside one large provides separate spaces for four fish. All the tubes are held firm in the gravel and protrude a few inches about the surface of the water.

* * *

Having badgered butchers for blood, stolen droppings from those cuddly, twitchy-nosed lettuce eaters and used yeast until my fish house

smelt like a brewery, I found that trying to cultivate daphnia in tanks indoors was just about as easy as crossing a piranha with a guppy! But now excuse me, friends, while I perform a couple of cartwheels round the picture rail because my transatlantic mail has brought a solution.

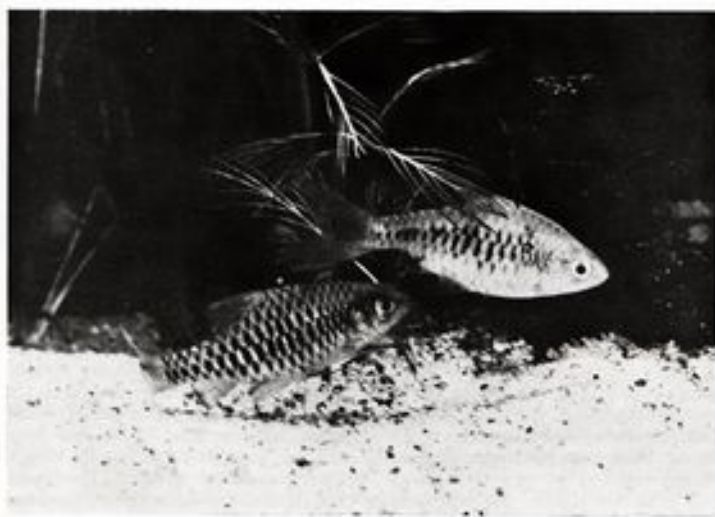
Postmarked with a Middle West address here is how our aquarist Hoosier, squared the circle . . .

'I discovered this method of producing these tiny crustaceans quite by accident.' (Here's the making of another Fleming!)

'Some *Daphnia* were introduced into one of my aquaria in which red ramshorn snails were being fed on spinach. Soon there were myriads of the little creatures which thrived and

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Chequer Barbs are Bound to Please



Barbus oligolepis

WHEN setting down my own observations on the spawning of any particular fish I look up as well the literature references for the past 20 years to see what sort of experience other authors have had with breeding the species and rearing of the fry. In the case of the chequer barb, I was very disappointed to find so little about them. I found this difficult to understand—just as it is difficult to understand why this lovely representative of the large Cyprinidae family is not found in community tanks much more often than it is. Certainly this species has been around for a very long time, being brought to Europe first in 1914.

It is a small fish, reaching a maximum size of only about 2 in. Not only is it peaceful and undemanding, but it is also very beautifully coloured. The background hue is reddish to yellowish brown with the belly lighter coloured. Each of its silvery scales has a bluish fleck and is black-bordered. The whole body gleams like mother-of-pearl (one of the common names for this species in Germany is, in fact, the iridescent barb). Over the body are a

By RUDOLPH ZUKAL

Photographs by the author

Translation by F. MARSH

number of irregular flecks and although these tend to disappear with advancing age, the tail-fin fleck does remain. The single fins are yellowish and the others colourless, but the male's fins, at spawning time, become brick-red, and they are black-bordered whereas the female's fins do not carry this edging. There are four barbels on the jaws.

Requirements of the chequer barb are simple. Ordinary tapwater can be used at a temperature of 70–74°F (21–23°C); a medium sized tank, normally



After the chase and display phases of courtship the pair swim into the plants. They swim side by side, bodies touching, and the male wraps his tail over the female (left photo). Release of eggs takes place (seen in the right hand photo) and the fish separate and descend motionless in the water.

planted and with good lighting, is quite suitable. Chequer barbs are no problem to feed as they will eat both dried and live food. Although they tend to search for food quite a lot over the bottom of the tank they do not dredge up the mulm or disturb the bottom in any way.

Breeding is relatively simple, the prerequisite being a suitable pair. I use a 2-3 gallons all-glass tank containing a few inches depth of medium hard water kept at a temperature of 78-79°F

(26°C). The tank should be planted with fine-leaved plants. Eggs will be laid in the plants and will be quite safe while the spawning is in progress, but immediately this has been completed the fish must be taken out for then they will eat the eggs with great relish. The brood hatches on the third day and the fry are very small and keep to the bottom of the tank, so that it is rather difficult to see them. Tiny food particles are taken up from the tank's bottom.



Spawning in the manner described above takes place several times, sometimes with release of eggs occurring close to the tank bottom. After spawning the pair sometimes fall to the bottom jaws first.

Close-up view of plant in the spawning tank after the chequer barbs' eggs have been dispersed. As well as the eggs many small particles of tank detritus stirred up by the spawning pair are caught up in the fronds



Transatlantic Topics

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multiplied until the snails were removed. Apparently the snail droppings made an active daphnia growing media *par excellence*. Seems that cooked spinach is superior to anything else for this purpose. A small piece of plaster of Paris kept the water alkaline.

Thank you Hoosier brother. There's only one snag as far as I am concerned, I've only just rid all my tanks of snails—red ramahorn included!

* * *

It had to come! The packaging of live, tropical fishes as if they were some inanimate object like a tin of fruit or a frozen dinner. In stores in La Mesa, California, they are displaying fishes in air-tight boxes that measure 1 in. by 2 in. by 3 in. Only about half of this volume is filled with water and the sealed containers indicate that the luckless fishes are not fed until sold. To add insult to

injury each box bears the legend 'chemically treated'.

Rightly indignant about this, the local aquatic group, the San Diego Society, have sent a strong letter to the stores headquarters complaining about this cruel method of merchandising and have told the owners that they are encouraging aquarists everywhere to boycott all the shops in the chain. Two of the other five points in their protest include letters to the various humane societies asking for their support—one even to Washington.

Describing the fish-in-boxes, one aquarist informed the club that, not only was the air temperature of the shop 'chilly' but that some of the fishes had white spot, were hollow-bellied and all were lethargic.

This example of man's greed is almost as bad as the other so-called toy emanating from the States. This consists of a small plastic bag containing plants and fish, the whole (according to the manufacturer) is to be tied to the handle of a baby's pram, providing a 'learning and development aid to baby in its first year'.

In my opinion it's the developers of such an idea that want to grow up.

* * *

Growing the plant *Aponogeton* in a hard water area is about as frustrating

as owning a 100 m.p.h. sports car that you can't get started! Yet Eugene Kling, an Alberta fishkeeper, has confounded the experts by growing these plants to heights exceeding 24 inches. His favourite is *A. crispus* (Thunberg), from Ceylon, a beautiful plant that carries bright-green, strap-like leaves, tightly crinkled at the edges. Height given by most authors is a mere 10 inches.

Eugene uses a bottom growing media of a thin layer of river mud covered with peat moss (the latter no deeper than a quarter of an inch). These two are topped off with a covering of fine, sea shore sand, well boiled before it is placed in the tank. After adjustment the DH of the water is in excess of 20, pH around 7.6. He likes to keep the water temperature topping 80°F.

These plants favour bright light and have grown well for him even under Gro-Lux, but strange to say, they do not seem to do well in full sunlight.

Crispus has both an active and a dormant period conforming to the seasons in their native island, so do not be discouraged if the leaves die back occasionally. If you wish to replant them then do so during the dormant period but handle the tubers with care. Despite their tough looking exterior they damage very easily.



GUPPY

World

STERILITY in guppies is a subject that has been written about many times in this column. Causes of sterility are many and varied ranging from improper types of illumination to sterility caused by certain chemicals.

It is worth bearing in mind that most *Poecilia reticulata* become sterile temporarily at times, particularly those males displaying the pastel shades. When this happens the breeder usually seeks some chemical cure and in his anxiety uses more than the recommended dose. The final result is that the condition is worsened and what was temporary now becomes permanent.

Sometimes the authorities add chemicals to our domestic water supply to protect our health and, under certain conditions, these too can cause temporary sterility.

If you suspect this condition in your fish don't rush to the medicine cabinet; simply give the fish a partial change of water and all other conditions being 'go' leave them alone.

The lack of breeding will most often soon right itself without further help from us.

• • •

Those who had the pleasure of hearing lectures by Dr Feroze Ghadially, author of *ADVANCED AQUARISTS GUIDE*, know that this expert fishkeeper was most fastidious about controlling the spread of disease. He rightly claimed that we

By PETER UNWIN

tend to under-estimate the risks we run when we use the same net, siphon or what have you, from tank to tank.

How to cut down these risks? With nets, the answer is obvious. Where possible have a net for each aquarium, but what about such pieces of essential equipment as the siphon tube?

One solution that has worked well for many years is to disinfect the tube after each operation by dipping it in a bucket of antiseptic. The solution is made by adding two drops of Dettol to a two gallon plastic bucket filled with hot water.

Once mixed the solution will last for up to a month. If you dip your nets in this for extra security, give them a good shake afterwards to remove the surplus liquid. Don't be perturbed about getting a few drops of this antiseptic in your guppy tanks; at this strength it won't do any harm.

Though many fishkeepers knew Dr Ghadially as an expert aquarist few knew that he also specialised in *Poecilia reticulata* and was a member of the Fancy Guppy Association in its halcyon days.

• • •

Taking a look at a brief history, we saw the pre- and post-war years laying down the foundations of guppy breeding and the first standards. The early 50s gave us the short-tailed varieties and the 60s produced the broadtail male, this particular decade going out with the emancipation of the female shape.

What will the 70s bring? Already there are moves afoot to develop and improve the colours of our guppies. Not the hybrid hotchpotch that were produced from the indiscriminate crossings but with the emphasis on producing better self colours and more pleasing 'mixtures'. Who knows—the Age of Aquarius may yet see the production of that elusive all-black guppy.

Guppy Types No. 8: The Albino

AN albino guppy is one lacking black pigment (melanin) but not necessarily lacking other colours such as red, yellow, orange, etc. Having no black pigment in the eyes, the blood in vessels behind them shows through and we see the characteristic red or pink eyes.

This beautiful, if somewhat rare, fish probably first made its appearance in the tanks of a New Jersey, U.S., medical practitioner called Abbs. This keen guppy breeder had been importing wild stock, from Trinidad and British Guiana (now

Guyana), since the thirties and by ensuring that they received ideal conditions and adequate diet was producing superior fish. In February, 1940, he observed the so-called albino. I say that doubtfully because in an exchange of correspondence, Dr Myron Gordon (the New York Aquarium geneticist), who had received some of these Abbs' 'albino' fish, had expressed his doubts about them. Though lacking body melanin the fish had black eyes. Some appeared red only at certain angles and when Gordon's assistant crossed

these types he produced the first true albino guppies.

Black pigment is produced by complicated step-by-step reactions involving amino acids (phenylalanine and tyrosine) to the final product melanin—several enzymes being responsible for the changes. In the albino we have a breakdown in the chain of reactions and no melanin is produced. An event so

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Breeding Goldfish

in Tanks

COLDWATER SCENE



By FRANK W. ORME

NEWCOMERS seem to think that some magic is needed to breed goldfish. There is not. Breeding goldfish is possibly the most interesting aspect of the hobby and all that is required is a little patience and knowledge, together with a true breeding pair and adequate aquarium space. I think that most novices who manage to obtain a spawning meet disaster by attempting to raise too many fish in insufficient space.

For the beginner intending to build up a hardy strain of his own breeding two important points must be stressed: never cross-breed different goldfish varieties—the resulting young will be useless; if possible, give the fish a winter rest. Fish which have been allowed to hibernate appear to be easier to condition and give a more vigorous spawning drive in the spring than fish which have been kept under warm conditions.

Apart from the stock aquarium, the minimum requirement will be two 3 feet tanks with heaters and thermostats. A quantity of green nylon knitting wool should be obtained for use as spawning mops, to be made as follows. Cut the nylon into 18 inch lengths and separate these into bundles of twelve or so strands. These should then be either bound or knotted in the centre, so that when they are doubled over mops about 9 inches in length are obtained. Weight each mop with a strip of lead and then boil them thoroughly to remove excess of dye and swirl the mops until the water runs clear. These mops will last indefinitely and can be boiled between each spawning so that no undesirable pests are introduced, as could be the case if pond plants were used.

Goldfish are normally bred during the spring, therefore about a month before you intend spawning the fish thoroughly clean the aquaria and, if possible, set them up in a greenhouse or in a position where they will catch the early morning sun. Fill the tanks with water and place the mops of nylon wool at both ends of one of the tanks. Do not add any other materials to either of the aquaria. Now select the pair of goldfish you wish to breed. The male can usually be recognised by the small white pimples, known as tubercles, on the gill plates and first rays of the pectoral fins. Both fish should be at least 2 inches in length.

If you suspect that the pair may be carrying flukes treat them in a disinfecting bath made with 10 drops of Dettol

stirred into one gallon of water for no more than 9 minutes. If the treated fish become obviously very distressed remove them immediately to a bowl of fresh water to recover for 10 to 20 minutes.

The aquarium without the spawning mops should be divided with a cross-piece of glass and one fish of the pair placed in each section. During the next 3 or 4 weeks feed the fish heavily with daphnia, frog tadpoles, whiteworms and earthworm, which should be chopped into small pieces. Each week siphon out the excreta and mulm, removing about a quarter of the water with it, and refill with fresh water straight from the coldwater supply. With this treatment both fish should soon be in the pink of condition, full of vigour. The female becomes plump as she develops her ova. The male will be paying attention to the female each time she swims near the partition glass, and his tubercles will be looking like little pearls on his gill plates and pectorals.

At the end of the conditioning period the first attempt at breeding can be made. If you are not successful put the fish back into the conditioning tank for a further week and feed them exclusively on chopped earthworm. Be patient! The fish will spawn as soon as they are ready but they will not be hurried and undue interference is likely to prevent them spawning.

For a weekend spawning place the male in the spawning tank during a Thursday evening. By the time the female is moved over to join him on the Friday evening he will have settled down. No food should be given. If a little later the male is chasing the female in a lazy fashion the likelihood is that Saturday morning will find the drive in full swing. This is not an infallible sign but I have noticed, over the years, that it often does precede a spawning.

The act of goldfish spawning is unmistakable. The male pursues the female relentlessly, nudging her side and nibbling near her vent. She is driven into the wool mops, where he places himself alongside her body; then, with a quivering, pressing upward movement, they part. The female releases a number of eggs, which as they fall through the water are fertilised by sperms in the milt released by the male. The eggs are clear to pale amber in colour and will adhere to the wool and tank glass where ever they touch.

Do not interfere with the fish; although the drive is wild the female will come to no harm. Around mid-day both fish can be removed and fed plentifully to rebuild their stamina. If they are left with the eggs they will eat them or any resulting young. Should the fish have failed to spawn by Sunday evening return them to the conditioning tank as mentioned above.

The tank containing the eggs should now have the temperature raised to 70°F (21°C), which will give a

hatching in about 4 days. This period has been found to give the best results. Each egg is roughly the size of a pin head; many of them will turn white, and these are the infertile ones. Since the fertile eggs become transparent the novice may well believe that the spawning has not been successful. Once again he should have patience, and at the end of the hatching he will find tiny glass-like splinters hanging on the wool and glass of the tank. These are the newly hatched fry and should be left as quiet as possible. However, a few drops of Liquifry no. 1, tube food for egg-layers can be added to the tank water to encourage microscopic Infusoria to form, for the fry to feed upon when they become free-swimming.

When the fry are seen to be swimming freely add more drops of Liquifry, three or four times each day for the next 7 or so days. In the meantime arrange to have some brine shrimp eggs hatching out so that these shrimps can be fed to the little fish when they are about a week old. Siphon the newly hatched shrimps into an old handkerchief, with care to avoid sucking up too many of the egg shells, and swirl the cloth holding the shrimps in the fry tank.

As the little fish eat this food you will notice their tiny bellies become red and they will fill apparently to bursting point. On this diet rapid growth will be made so that in a short time small sifted daphnia can be offered, together with whiteworms that have been mashed into a pulp. Do not overdo the supply of whiteworms or it will foul the water and kill the youngsters. The aim is to keep their stomachs filled without overfeeding.

With a good spawning a thousand fry could result, and although they can be crowded for a short time it is essential, if they are to remain healthy and grow, that they be given as much space as possible as soon as possible.

I shall next deal with the sorting of the fry, and the points to look for in deciding which fish to keep and which to scrap. The question of feeding will also be discussed. In the meantime clean out the second of your 3 feet tanks

Jobs for This Month

- Keep a keen watch on pond fish, as they become more active, for signs of fungus growing on any of the stock. Badly affected fish should be netted for treatment with sea salt solution in a glass tank or large plastic bucket.
- Make your final choice of breeding pairs or, if you are starting with goldfish for the first time this year, obtain the best breeding stock you are able to find. Obtain fish from a known good strain if you have the opportunity.
- Although water temperatures in the pond are unlikely to be high enough for regular feeds to be provided you can begin weekly tests of the response of the fish to some pieces of earthworm or pond food pellets. Adjust the amounts you give according to the eagerness of their reaction to the offer of food.
- Small ponds that were not cleaned out last autumn wholly or partly will be in need of cleaning at the end of this month, particularly where fallen leaves from trees have been allowed to accumulate in the water's depths.
- If you are planning a new pond the site should be cleared and digging can commence. Send for pool-liners or prefabricated pool catalogues, or make plans to get your concrete laid if you are doing it the hard way.

and raise the temperature to 70°F (21°C), so that the water corresponds with that of the hatching tank. Obtain two bowls, one of which should be white and will be required for sorting the small fry, which I hope will be swimming in your aquarium by the time my next article appears.

The Albino Guppy

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rare (according to Henry Kaufman, an experienced breeder of the albino) that it occurs only once in every 8 million guppies born!

Despite these overwhelming odds many fishkeepers have tried to produce albinos. Frank Alger in the late forties bred some fine specimens in the U.S. along with George Phillips in Britain. Nearer modern times, Albert J. Klee wrote in the April, 1964, issue of *THE AQUARIUM* (U.S.A.) that albinism was a semi-lethal mutation having an associated high mortality rate in fry before birth. If grey were mated to albino, instead of the expected 3:1 wild to albino ratio, practical tests showed it to be nearer 53:1.

According to my researches no albino guppies have ever been reported in the wild, probably (apart from the genetics discussed) because the albino female parent has a habit of eating her young. The light-coloured fry are easy to spot by all predators—related or otherwise!

With guppies in captivity, breeders over the years found that the shape of the fins in most varieties could be controlled much more easily than body or finnage colour. This reason alone kept the albino a rarity. In the 1957 Fourth Berlin International Guppy Show the class for these fish was dropped from the show schedule. Lack of support the previous year was the reason given. Two years

later, the Better Guppy Guild of Chicago brought out a recommended alternative set of standards to those just published by the American Guppy Association. Under the heading 'Colour Variations' they included the albino, insisting that fish in this class must display a red or pink eye at all angles.

Over here, British standards have always accepted the albino as just 'another colour' to be benched according to its finnage shape. Because albino guppies tend to lack the size of their 'multi-hued' brethren they were never a popular variety with the showman. Yet one more nail in its coffin!

It seems that the albino is not only lacking in pigment but lacking in supporters, too! A pity, because anyone who has seen specimens of this attractive fish has usually fallen under its spell.

J. K.

"Our Compliments to the Chef"

By CLIFF HARRISON

DURING bad weather even a trip to the local aquatic store can occasionally be a daunting prospect for the most hardy of us, so we should all spare a thought for the men who provide our fishes with live foods so regularly throughout the year—come rain, snow, hell and (literally) high water. One such stalwart of our hobby is Albert Villiers who has been collecting tubifex worms and other live foods in and around London for over 20 years.

Mr Villiers started his trade in a most improbable way; he discovered way back in 1949 that by cycling out into the country and collecting daphnia, water plants, frogs and the like in his spare time he could supplement his rather meagre income as a chef. Being a particularly astute man, he soon realised the potential to be achieved in a hobby which was growing so rapidly at that time, and so decided to make his collecting a full-time business. Over the years he graduated to a motorcycle and, more recently, to a van, and now employs two young assistants full time to help him.

His day will usually start at 2 a.m., when he weighs out tubifex and prepares the orders for more distant customers: these include some as far away as Aberdeen and Plymouth, and cover every English county except Rutland. He then delivers these to all the main London rail termini, and hopes to return home by 6 or 7 a.m. before the morning rush-hour starts. He then has to prepare and deliver supplies to the Greater London area, with the help of his assistants, and this is naturally no easy task during the day.

Between his deliveries, on 5 days each week, Mr Villiers must also arrange the actual collecting of the tubifex, the time for this being dependent on the tides in the lower stretches of the Thames. The most

popular collection areas are in the very heart of the capital, stretching downriver from Chelsea, around the sewage outfalls (on which the tubifex relies for nourishment). In shallow water, the worms can often be seen in large clumps, appearing as dirty reddish patches on the surface of the mud. The method of separating the worms from the mud is straightforward, and little more advanced than that in use 50 years ago.

The collector first dons thigh-length waders and long rubber-gloves stretching to his elbows (these being the only acknowledgement to twentieth century progress), and shovels the top 2 inches of mud into a special sieve. This sieve, approximately 24 in. by 12 in., has a fine-mesh nylon net on a steel frame, and incorporates a pair of handles to facilitate the sieving operation. When half-full the sieve is carried down to the shore and gently swished around in a few inches of water to let the mud wash away. After some minutes of this back-breaking work, the net will contain a mixture of tubifex together with the larger items of debris—twigs, pebbles and all kinds of rubbish, which must be removed later. This procedure is repeated until a sufficient quantity is obtained, taking up to perhaps 2 hours to complete.

In the spring of 1970, the Port of London Authority decided to regulate the number of tubifex collectors on the Thames by the issuing of licences. Only 20 such licences are being issued, and each one, at a cost of £100 per annum, allows two collectors to operate in the P.L.A. area. Previously this facility had been open to all, professionals and amateurs alike, but in practice very few hobbyists ever bothered to collect tubifex for their own limited requirements.



Mr Albert Villiers at work with his sieve for tubifex in the Thames at London

The tubifex is then taken in large cans to a specially laid-out shed where it is further cleaned in shallow trays, and kept under running water to cleanse itself of the gut contents. Mr Villiers claims to hear Big Ben chime every single hour over the period of 2 weeks (since the time of low water changes from day to day), and with two decades of collecting to his credit the sound of those bells must be like an old friend to him.

Transportation of the wet worms to the more distant parts of the country naturally poses problems. Probably the most satisfactory way is to line shallow cardboard boxes with polythene and damp newspaper, and then place a ½ inch-deep layer of tubifex on to this—ensuring there is no surplus water on the surface. Provided that holes are punched in the sides of the box to allow a free flow of air, the tubifex will keep for a number of hours in all but the very hottest of weather. As a guide to the demand for this live food, Mr Villiers spends over £2500 a year on rail charges alone!

There is probably no subject in the hobby more controversial than the

wisdom of feeding live tubifex worms to aquarium fishes (witness the correspondence in PFM in November and December last year). One camp will draw attention to the natural conditions where tubifex is found—often where the higher forms of life have been killed-off by pollution, and cite numerous instances of 'mysterious' deaths, boils and swellings amongst the inmates of their aquaria. Others will vouch for the value (perhaps even essentiality) of tubifex for getting fishes into breeding condition and keeping the larger and more fussy varieties well-fed all the year

round. There is truth in both arguments, for any polluted or bad food can cause problems; but provided that the tubifex is regularly cleaned and kept under running water, little trouble is likely to be experienced by feeding it to the larger fishes. For those who wish to be particularly cautious, the use of an aquarium antiseptic such as Discasolve, followed by chopping of the worms with a razor blade, is to be recommended.

However, to many aquarists (myself included) tubifex is a reasonably priced high-protein fish food, which is particularly relished by most

varieties. But perhaps an even greater pleasure is experienced by the proud owner as he watches the hustle and bustle for each individual worm as it sinks slowly downwards.

Mr Villiers, already a well-known visitor to clubs in the south with his numerous and elaborate yards, has recently made a film about tubifex collecting covering the full story from River Thames to the local aquatic store. This is an interesting documentary (Mr Villiers provides a live commentary to the film) and should be a popular feature with club members.

Hints and Tips with Surplus Plastics Part 3

By H. J. GILBERT

FROM the use of plastic bags to jobs for polythene sheet is a short step. A wooden or metal box of suitable size will make a quite useful temporary tank provided that care is taken to round off all sharp edges and corners before lining it with polythene sheet. Do not cut the sheet, but fold it carefully and neatly to fit the contours of the box and hold it in position with adhesive tape on the outside. The depth may be adjusted by the addition of sawdust or sand, placed between the polythene and the bottom of the box.

If you wish to heat this temporary tank with an ordinary aquarium heater, make sure that it does not come anywhere near the lining or disaster will overtake your set-up when the heater comes on. Do not rely on proprietary heater holders to secure the heater in position in this particular set-up as their suction pads may not hold securely on the polythene lining. It is preferable to immerse the heater in a jar of water, which in turn is placed in the home-made tank, in the same manner as adopted by some breeders to prevent their fish fry from committing suicide by settling on the bare heater. These polythene-lined boxes make useful storage tanks for rainwater or sea water as the material is quite inert.

Plastic sheeting is now extensively used for temporary ponds of all kinds, but care should be taken in the preparation of the site because of the sheet's proneness to damage by sharp stones or aggressive root systems, and of course there is no protection

against any maliciously flung stones. Emphasis should be put on the temporary nature of this type of pond because of deterioration of the plastic exposed to air above water level.

Those of you who struggle daily with the old-fashioned safety razor will no doubt, in shopping around for the best blade to deal with your particular type of beard, have come across the kind in a neat plastic container with a compartment in the reverse side for the safe disposal of used blades. If you have a number of tanks and wish to make easily visible notes on them about the contents, whether it is fish, plants, breeding data or disease treatments, these containers, stuck on to the aquarium frame, make ideal card holders. A stock of cards cut to size makes it easy to change the information as necessary. Whilst it is not essential, it is possible to remove the used blades from the rear compartment, before attaching it to the tank frame with an impact adhesive.

Some horticultural suppliers are marketing a plastic netting which can be of great use to the average aquarist. Usually green in colour and with an approximately $\frac{1}{4}$ in. mesh, it is easily cut with household scissors. It is ideal for the manufacture of breeding traps and tank dividers. For the latter a simple wooden frame is necessary to hold it in position but

for breeding traps the edges can usually be stiffened sufficiently by folding them over and sewing in position with nylon thread. The whole is suspended in the tank with clips made of lead, stainless metal or plastic-covered wire.

Still in the horticultural department, there are decorative mesh plastic flower pot-holders available in a variety of colours and sizes, which, provided that the mesh is small enough to restrain the fish, will make ideal isolation units. If you breed Siamese fighters and have a number of males to separate, several of these containers may be threaded on to lengths of plastic-covered wire and suspended across the top frame of a tank. Usually the container bases are solid and so provide a tray to hold any worms etc. that may be fed to the fish. If only single pot containers are used they may be held in position in the tank's corners by means of two rubber suction pads. The type with knobs attached are most suitable as the knob portion may be secured through the container mesh. If, as mentioned previously, this device is used to house male fighters it will be found much easier to keep the tanks clean than if the fish were kept in separate containers and fed as heavily.

Some household appliances that may similarly be adapted for fish isolation units or breeding traps suspended in larger tanks are the plastic mesh meat-covers and sieves available in many chain-stores.

To be continued

Readers' Queries Answered



Cloudy Tank

I am very displeased with the appearance of my new tank (warm water). I have very few fish in it yet but the water always looks cloudy and there is already a scum on the surface.

The scum is almost certainly easily disposed of. It might only be due to small amounts of oil that have separated from the new putty and can be removed by drawing a clean sheet of absorbent paper across the surface of the water. If this is done daily you will have no further trouble with surface scum after a week or two. The cloudiness of the water may possibly be due to your not having washed the gravel sufficiently. The amount of dust in commercial gravel varies a great deal and it can be quite a long job to cleanse it by repeated siftings under a running tap until water from it, held up in a jam jar to the light, is seen to be quite clear. Another possibility is that you are overfeeding with dried food for so few fish. The initial 'wishy-washy' effect of a newly set up tank is often caused by lack of plant growth. Many newcomers to the hobby cannot be persuaded to buy a sufficient number of plants to start a really good plant growth. Six small pieces of *Vallisneria* will certainly grow in time, but in the meantime there will be months of disappointment every time you look at the tank. Do be guided by your dealer. Better to have four fewer fish to start with to make certain that there are enough plants in the tank.

Angel Parents

I have a pair of angel fish that have now spawned three times and each time they have eaten the eggs. Is this always going to be the pattern now and should I remove the parent fish next time as soon as I can?

It may well be that this same pair of angels will rear a brood of young, but it would certainly be easier to

remove the eggs (not the parents, as angels will react very badly to such treatment and it is unnecessary to disturb them). If the eggs have been laid on the aquarium glass then a tank divider should be used to keep the parents away, but if, as is more usual, the eggs have been laid on a broad-leaved plant or on a bar of vitrolite propped up against the tank glass for that purpose, the batch can be removed into a separate tank. The water in this tank should be of the same temperature as that in the main tank and lightly coloured with methylene blue against risk of fungus. Gentle aeration should be introduced to simulate the fanning movements that the parents make over the eggs to create water flow.

Treatment of Fungus

Some of the goldfish in my pond have patches of grey-white on them. I'm afraid it may be fungus and should like to know how to treat it.

The end of the winter is the time when coldwater fishes wintered out-of-doors easily develop fungus. Often little attention has been paid to the pond in the autumn and by the end of February decaying matter at its base will have produced a very unwholesome environment for the fish, just when they are least able to combat disease at the end of the winter fast. However, if the fishes are otherwise well, fungus can be successfully treated. A well-tryed treatment is to keep the affected fish in a solution of sea salt (or rock salt) in the following concentrations per gallon of water: first day, 1 ounce; second day, 1½ ounces; third day, 2 ounces; fourth day, 2½ ounces. The fish can be kept in water at this salt concentration until the fungus begins to disappear, when the reversal of the order of these daily baths should be carried out until the fish are once again swimming in fresh water. If you would prefer not to have to make

up the salt solutions you can use one of the advertised fungus remedies.

Frogs in a Pond

Can frogs harm the fish in my pond? Last year I saw a great many frogs in this area and now that I have a pond I do not want them to harm my fish.

It is true that a male frog in the fervour of breeding behaviour, in which it grips the female frog round the body, may for want of an amphibian partner grip hold of a larger fish. If movement of the gill covers of the fish were to be impeded as a result this could cause the fish's death. But this is quite an infrequent phenomenon. A very large quantity of frog spawn may be thinned out (move it to another pond) so that the surface of the pond is not choked. But frog tadpoles are a welcome food to the fish and are themselves quite good scavengers and algae eaters. One point to bear in mind is that frogs using your pond for spawning should have some means of egress if the water surface is well below the pond edge and its sides are very smooth. If they are unable to leave the water they will die in the pond and too many dead frog bodies will pollute it.

Disappearing Plants

In spite of this mild winter so far the Canadian pond weed in my garden pond, which has always flourished particularly well, seems to have disappeared. What can be the cause of this?

It may well be the mildness of the winter that has indirectly caused the disappearance of the *Elodea canadensis*. You write from the south where there have occurred several unseasonal warm spells. If you have not been checking your fishes' food requirements very carefully they have probably been feeding quite heavily on the pond weed during these spells. However, there will almost certainly be enough shoots of the plant left to start its growth in the spring—it is one of the most strongly growing pond plants of all. Pond plants make no growth during the winter and by the time the old growth has died back it could be thought that there is nothing left for next year's growth; but with the spring they will be flourishing again.

When Fins are Injured



Bites caused the first damage to the tail fin of this female swordtail (top picture) but the tissue is still healthy and has started to regenerate. A fully regenerated tail fin (bottom picture) shows the branching of the new fin rays from the line of injury

AMONG the disorders to which tropical fishes are prone is injury to the fins. Most frequently it is the caudal fin that is involved, but damage to the unpaired dorsal fin and anal fin is common. Some tropical fishes are predisposed to this because of the anatomical peculiarity of their finnage, i.e. the variability in the size and length of these, but the fins of most fishes very often become injured and bruised. Causes of injury may be some of the following: vigorously swimming past a sharp object, or even in a thick growth of

plant while the fish chase around it before or during spawning, and often injury also happens when a fish is caught, or when it is carried in an unsuitable container.

The fins represent an important part of the body of the fish. Anatomically they consist of skeletal parts, that is to say the rays of the fin, which stiffen it and give rise to its characteristic shape. As the fish grows the rays of its fins also grow. With a specific fish the number of rays is constant for its type, so that one can also identify fish by them.

By Dr Z. LUCKY

Photographs by
RUDA ZUKAL

Translation by F. MARSH

The fin rays can end as sharp points, or they can sometimes branch. Examples are found of saw-shaped rays with tiny teeth on the back edge.

The fin rays are linked to the muscles by their tendons, which make movement of the rays in all directions possible, either gradually or suddenly. Wave-like movements of the fins are rhythmic. The play of the fins of tropical fishes, particularly at spawning time, is a truly marvellous sight.

The fin rays are found in pleats of the skin, so that the fins are variably coloured, just as is found with other parts of the body surface. In the skin of the fins are fine veins and nerves. When the fin is damaged, alterations and healing processes take place just as with the body skin. The injury is more complicated if it involves a crushing or breaking of a fin ray. Superficial fin injuries, like skin injuries, cause a milky opaque appearance to develop. Deeper wounds cause loss of blood and also the injured place in the fins can be invaded by pathogenic agents or spores of parasitic fungi (mycosis), so that specific illness can be caused (bacterial degeneration or saprolegniosis of the fins).

If there are no complications a wounded fin will heal in the course of a few days. New epithelial skin cells are produced from the edge of the wound, growing to the middle. As first the healed skin is without pigment. By degrees light-brown pigment cells increase in the healed part and gradually the pigment in these cells becomes black. It takes even longer before the cells are capable of

concentrating their colouring matter in tiny particles, as normal melanophores in the skin can do, so that the healed spot remains dark coloured for a long time.

With deep injuries to skin of the fish body the scales are often torn off. If the scale-forming connective tissue is not damaged, a new scale will form spontaneously. Similarly the fin rays will regenerate themselves only if there is no damage to the root part of the fin ray. If at least a part of the fin ray is saved, its regeneration soon starts naturally. It often happens that the new rays are longer than the original ones. On the soft, delicate regenerated fin rays that normally branch towards the periphery of the fin one can notice that branching



Breakdown of the tailfin of this tiger barb (above), and fungal infection, has followed damage. The condition has been improved by treatment with acriflavine



Healing has occurred at the damaged caudal peduncle of the angel fish (left) but regeneration of the tail fin has not and never will take place in this instance

A female cichlid left with her mate after spawning suffered damage (shown below) to all her fins from his attacks. Infection did not occur and new growth occurred progressively

occurs from the place of the injury. Healed rays are often wavy or irregular in form.

By careful handling of fishes and the correct choice of varieties to be kept together in the community tank, injuries to fins can be avoided. When injury occurs we must give the fish nourishing foods and in this way aid the quick healing and regeneration of the fins. To prevent bacterial breakdown of the fin the addition of neutral acriflavine (half of a 1.75 grain tablet dissolved in water before addition to a 10 gallon tank) or the use of a preventive of fin rot, as sold by dealers, together with a rise in water temperature to 77°F (25°C), where possible, are recommended steps to take.



Another Breeder's Experiences with

The Humphead Cichlid

By MATT MOOR

RUDOLPH ZUKAL's article in the December, 1970 issue of *PFM* on *Steatocranus casuarina* will no doubt have stimulated interest in this delightful little cichlid, which is quite often available through the trade. I have been keeping and breeding the humphead—or blockhead as it is more often called in this country—for years, and readers may be interested in my findings.

Rudolph Zukal's photographs were of comparatively young fish. They become much more magnificent as they mature, the characteristic hump on the male's head reaching quite amazing dimensions at 2 years of age or thereabouts. The female also develops a hump, but this remains always much less pronounced. In breeding condition the male's coloration tends to lighten towards a golden brown, whereas the female's darkens to a dusky bluish grey. As they are not aggressive, except among themselves at breeding time, they make excellent community fish provided that they are mixed with very active fishes of similar size or larger. They should not be mixed with slow-moving and inactive fishes, however, as their quick darting movements tend to upset them.

I have not found that they are abnormally timid, spending much of their time in hiding, as Zukal suggests. On the contrary, provided that they feel secure in their surroundings they soon become quite tame, begging for their food at feeding time, which they will take from the hand in swift dashes. Nevertheless, they do need an aquarium of ample size liberally furnished with tunnels among rockwork, into which they retreat for hours.

Water conditions, except at the extremes of hardness and pH, do not seem to worry them overmuch, but stale water does. Frequent partial water changes are essential because their oxygen requirements are high—they come from reasonably clean and swiftly flowing waters that are naturally well aerated. They are also heavy feeders and great care must be taken to satisfy their appetites without providing excess of food that can foul their water.

Humpheads will eat practically anything edible, including dry foods of all kinds, but to condition them for breeding they should be well provided with chopped earthworms, ox heart and other high-protein flesh foods. A small proportion of green food such as chopped lettuce or spinach should also be included in their diet. Their food should never be chopped too fine because they prefer to carry off a mouthful at a time, which they masticate within their caves, returning for more once this morsel has been consumed.

They will tolerate a wide range of temperatures but they are happiest and breed most readily in the upper seventies and lower eighties. Sexing before they are really mature is not always easy, for though some males are 'early developers' and begin to show a pronounced hump when still quite young, others remain almost indistinguishable from females until they are fully grown.

Breeding pairs are best obtained by raising half a dozen or more humpheads in a fairly large tank well provided with rockwork, and waiting for natural pairings to take

place. Like many of the *Cichlasoma* species from South America, these small African cichlids are choosy about their mates and incompatible pairs forced into each other's company often fight quite viciously, the female usually getting the worst of the bargain. Compatible pairs on the other hand live peaceably together for years on end, whether breeding or not, and the sudden domestic quarrels so characteristic of many other West African 'dwarfs' seldom if ever occur.

Humphead cichlids, provided that they are well matched, look after their broods together, but, contrary to what Rudolph Zukal suggests, I have found that it is normally the male who takes the major role. It is he who fans the eggs until they hatch and it is he who breaks up food in his mouth to feed the fry. His mate assists him to some extent with both duties, but most of the time she merely remains in or near the nest like a handmaiden awaiting instructions.

The eggs, which are laid upon a rock surface within a cave (I find that carefully arranged rock caves and tunnels are much better with this species than upturned flower-pots) are very large indeed. They resemble flattened discs almost 2 millimetres in diameter! Yet broods can be quite large for all that, often numbering over a hundred fry. Unlike most cichlids the humpheads do not lead the fry into the open water in search of food once they become free-swimming, but instead the fry are kept within the caves under the watchful eye of the ever solicitous male, who takes in food for them, which he pre-masticates. In fact, the first time I ever bred the humphead cichlid I was not aware I had a brood at all until the male unexpectedly issued forth leading a hundred large fry obviously many weeks old!

The fry are comparatively easy to rear. They grow quite rapidly and feed very heavily. Unfortunately, however, they are even more susceptible to stale or foul water than their parents so that rearing becomes a steady routine of heavy feeding combined with changing a third or more of the tank water every 2 days at least. If these water changes are neglected their fins rapidly become clouded by bacterial infection and they begin to die off.

The fry can be left quite safely with their parents until they are fully grown and they should always be left with them until they are swimming and feeding independently. Attempts to hatch the eggs and rear the young artificially seem always to result in heavy losses and stunted fry. Furthermore no attempt should be made to offer special fry foods to the very young fry, as they will remain healthier and grow faster if the breaking down of food for them is left to their parents. By the time they are swimming independently of their parents and seeking their own food they will be large enough to masticate normal flake and freeze-dried foods, and chopped earthworms or

small whiteworms, as well as half-grown brine shrimps. This species as a whole seems to dislike finely divided food of any kind and even very small live food, and if these are used for feeding the tank water soon becomes foul.

Provided that care is taken to keep them in clean, well

oxygenated water, the humpheads make most rewarding aquarium fish. Their unusual method of swimming in rapid darting motions and the ease with which they become quite tame gives them a personality all their own—which quite outweighs the fact that they are not particularly beautiful or colourful in the accepted sense.

One Man's Marine Aquarium—6

Marine Fishkeeping in the Future

FOR the hobbyist with an enquiring mind, marine fishkeeping is open to all kinds of research and discovery in which even the modest beginner can play a part.

It is only a matter of time, for instance, before someone is able to master the techniques of successful marine fish breeding. The huge shoals of coral fishes to be seen swimming in a Hans and Lotte Hass film of their natural habitat, despite the large number of natural enemies, must mean that such species are tremendously prolific in their reproduction.

A number of salt water fishes have already been bred in captivity. The clown fish for instance has been spawned successfully and the surprising thing is that the method used was not unlike the procedure for spawning freshwater tropicals. A pair were discovered; they were richly fed to bring them into spawning condition, separated for a short period and then reintroduced in a tank of their own. Difficulty was experienced in rearing, especially in the early stages, but with the help of marine Infusoria the clown fry were soon raised to the stage where the youngsters were able to take live brine shrimps.

For the serious aquarist who seeks a challenge breeding marine fishes will be an absorbing hobby. Should he be successful and become able to rear a shoal of Beau Gregories with the ease of rearing a shoal of dwarf cichlids then there is surely a fortune awaiting him.

There are a great many other fields of research in which the serious marine aquarist can play an important role. To date for instance only a



Photo:

B. PENGLEY

Will it ever be possible to achieve tank spawning of such tropical beauties as the blue angel (*Pomacentrus semicirculatus*), as many mariners hope, in the future?

By **RON TURNBULL**

minority of (mainly uninteresting) plants can survive in the salt water aquarium. Surely there must be some marine flora that could be adapted in much the same way as the cabomba or the Amazon sword have lent themselves to aquarium culture. We may even see the day when some of our own seashore plants have come to live and flourish in the tropical marine aquarium.

A number of dedicated aquarists have had thoughts of adapting salt water tropicals to living in a freshwater tank. After all, they say, the mollie and the guppy can even be bred in salt water. Similarly, the

salmon can live in both rivers and the sea and, as a keen angler myself, I have caught codling to 8 or 10 pounds 5 miles inland from the mouth of a North Sea river. Personal experiments have yielded surprising results indeed, and I have kept marines in a wide variety of salinities.

Indeed one trick of the trade is to submerge a marine fish with a mystery disease into completely freshwater, after decreasing the salinity of its tank water gradually, of course. Many a fish has made a dramatic recovery after treatment in this way.

On the technical side there is still a lot of room for experiment in the fields of feeding, pH, transportation, harmonious living in marine communities, temperature, in fact the door is wide open for both the serious and the not so serious marine fish hobbyist.

Organisation of Show Classes

By R. D. ESSON

Chairman, Federation of British Aquatic Societies

F.B.A.S. Basic Show Class Letters

A. Furnished Aquaria and Aquascape	H. Corydoras and Brochis	Q. Swordtail
B. Barb	J. Rasbora	R. Platy
C. Characin	K. Danio and W.C.M.M.	S. Mollie
D. Cichlid	L. Loach	T. A.O.S. Livebearer
E. Labyrinth	M. A.O.S. Tropical Egglayer	U. Singletailed Goldfish
F. Egg-laying Toothcarps	N. Pairs of Fish	V. Twintailed Goldfish
G. Tropical Catfish	O. Guppy Male	W. A.O.S. Coldwater
	P. Guppy Female	X. Breeders Classes
		Y. Marine Fish
		Z. Plants

These are basic classes and are not to be amalgamated in any way. An Open Show schedule will have to contain 20 basic classes to obtain F.B.A.S. support. Note that for this purpose all subdivisions of Furnished Aquaria, Aquascape and Breeders classes will count within the total as basic classes owing to their special nature. The only exception to this is the Open Show catering for a recognised specialist society, i.e. Guppies, Goldfish.

Sub-divisions of Classes

A. Furnished Aquaria and Aquascapes

Aa. Club Tropical Aquaria	Af. Indiv. Marine Aquaria	Ak. Miniature Aquaria
Ab. Club Coldwater Aquaria	Ag. Junior Tropical Aquaria	Al. Club Aquascape
Ac. Club Marine Aquaria	Ah. Junior Cold-water Aquaria	Am. Indiv. Aquascape
Ad. Indiv. Tropical Aquaria	Aj. Junior Marine Aquaria	An. Novelty Aquascape
Ae. Indiv. Coldwater Aquaria		Ao. School Furnished Aquaria

B. Barbs

Ba. Binotatus; Camptacanthus; Chola; Dunckeri; Everetti; Filamentosus; Lateristriga; Orphoides; Paludinosus; Stigma; Schwannfeldti; Lemon Fin.

C. Characins

Ca. Hyphessobrycon; Hemigrammus; Cheirodon
Cb. Nannostomus; Poecilibrycon

D. Cichlids

Da. Angels
Db. Apistogramma; Pelmatochromis; Nannacara

E. Labyrinths

Ea. Betta splendens
Eb. Colisa; Helostoma; Ophronemus; Sphaerichthys; Trichogaster; Trichopsis

Continued on opposite page

THE Federation of British Aquatic Societies have developed over the years a class-lettering system for use of clubs at their open shows and this is used by all affiliated societies. There was a little confusion by some non-affiliated members last year when they entered a few shows. The system is simple, and as we want all to enter F.B.A.S. sponsored open shows, I would like to explain how it works.

Firstly a word about F.B.A.S. sponsored open shows. Any of our affiliated societies can run a sponsored open show. It means that all the judges are accredited and recognised by the Federation, and not just 'old Bill' from the club down the road. It means that the show is really 'open'; there can be no closed trophies or classes. If your fish is best then it wins, club member or not, affiliated to the F.B.A.S. or not. This also goes for all the Federation's Open Show Championship Class trophies—32 trophies given away every year through the societies' open shows. This apart from the societies' own trophies, of course. Lastly it means that the show will be run to F.B.A.S. rules, the only rules that recognise that the exhibitor has rights which are

paid for. Every exhibit entered is judged and pointed, for every exhibitor has the right to know the value of his exhibit. Now on to the class-lettering system.

As can be seen from the lists each basic class has been given a capital letter; a class can be divided into smaller classes by adding a diminutive letter after the capital, and all sub-division has to be by species or variety. Many sub-divisions exist and further sub-divisions are being made as the classes are required by societies. To maintain order to the system a new sub-division is requested by a society to the F.B.A.S. Judges and Standards Committee, who look into the practicability of that sub-division. If it is approved it is given a sub-division letter, which would then be used throughout the Federation. In this manner, every society uses the same letters in the same way.

Any F.B.A.S. open show can be entered by an exhibitor without even seeing the show schedule provided that he has the address of the show manager. Write the number of exhibits you wish to enter with their class letters, e.g. "Three Siamese Fighters—Ea", on each of two sheets of paper and send them in. If there is to be no class Ea, then the fighters would automatically go into the laymonth class E, and so on. Always enter under the maximum sub-division if you have no show schedule.

The Aquarium Show (29th-31st October), run jointly by RIFISH SOCIETY and the F.B.A.S. at the Royal Horticultural Society's Old Hall, London, uses the lettered schedule system. Fill one in and try it out.

A LARGE plaque, dedicated to the memory of the late chairman of the FEDERATION OF BRITISH AQUARIUM SOCIETIES Mr Ted Stamp, has been purchased by the Federation Council and is to be suspended for by all the current year's Championship Fish Trophy winners. It is to be known as the F.B.A.S. Supreme Championship Fish Trophy. An announcement of special interest for all societies in connection with this trophy is expected to be made at the F.B.A.S. Assembly in London on 6th March.

F. Egg-laying Toothcarps

- Fa. Aphanis; Choriopeops; Jordanella
- Fb. Aplocheilus; Pachypanchax; Epiplatys; Micropanchax; Doerpanchax; Pseudepiplatys; Aphyoplatys
- Fc. Aphyosemion; Rolfia
- Fd. Rivulus; Fundulus
- Fe. Cynolebias; Pterolebias; Austrofundulus
- Ff. Nothobranchius; Rachovia

M. A.O.S. Tropical Egglayer

- Ma. Labeo

N. Pairs of Fish

The prefix letter 'N' before any class letter indicates that the fish in that class must be shown as a pair. N.F. would therefore indicate pairs of Egg-laying Toothcarps, N.B.-M. would indicate any of the tropical egg-laying fish and N.O.-T. any of the tropical livebearing fish and so on.

O. Guppy Male

- | | | |
|----------------|----------------------|-----------------------|
| Oa. Roundtail | Og. Doubleword | Om. Short Dorsal Veil |
| Ob. Cofertail | Oh. Lyretail | On. Delta |
| Oc. Speartail | Oj. Scarftail | Op. Flagtail |
| Od. Pintail | Ok. Original Veil | Oq. Fantail |
| Oe. Topword | Ol. Long Dorsal Veil | Or. Dovetail |
| Of. Bottomword | | |

P. Guppy Female

- | | | |
|------------------|----------------|-----------------|
| Pa. Roundtail | Pd. Scaloptail | Pf. Cofertail |
| Pb. Superba | Pe. Wedgetail | Pg. Naturaltail |
| Pc. Metropolitan | | |

U. Singletailed Goldfish

- | | | |
|----------------------|----------------------|------------|
| Ua. Common Goldfish | Uc. GSGB Singletail | Ud. Comets |
| Ub. London Shubunkin | (Bristol Shubunkins) | |

Two classes can be made thus: Ua-d. and Ud-c.

V. Twintailed Goldfish

- | | | |
|--------------------|-----------------|----------------|
| Va. Veiltail | Vf. Oranda | Vj. Celestial |
| Vb. Fantail | Vg. Pearlscales | Vk. Bubble-eye |
| Vc. Globe-eye | Vh. Lionhead | Vl. Pom pom |
| Vd. Broadtail Moor | | |

Two classes can be made thus, Va-g. and Vh-l.

W. A.O.S. Coldwater

- | | | |
|------------------------------------|-------------------|------------------------------|
| Wa. Hi Goi; Leather & Mirror Carps | Wb. Centrarchidae | Wc. Golden Tench; Orfe; Rudd |
|------------------------------------|-------------------|------------------------------|

X. Breeders

The letter X before any class letter indicates breeders thus;

- | | |
|--------------------------------------|---------------------------|
| X.B-M. Tropical Egglayers Breeders | X.U-W. Coldwater Breeders |
| X.O-T. Tropical Livebearers Breeders | X.U-V. Goldfish |

Y. Marine Fish

- | | |
|--------------------------|---------------------------|
| Ya. Tropical Marine Fish | Yb. Coldwater Marine Fish |
|--------------------------|---------------------------|

Z. Plants

- | | | |
|-------------------|--------------|---------------------|
| Za. Rooted Plants | Zb. Cuttings | Zc. Floating Plants |
|-------------------|--------------|---------------------|



AT their meeting held at St Laurence Church Hall, Hamblon Avenue, Barkingside, ILFORD & D.A. & P.S. very much enjoyed the Hendon & D.A.S. lecture and slide show on barbs. Cups and medals were presented to those members who had won in the various club competitions during the past year. Also held at this meeting was the second of the club's 'Show Jar Competitions', now an established competition with a Cup awarded annually to the best entry, since the first, in January 1970, proved so popular. Competitors are required to furnish a standard 4 in. square show jar to their own design, the only stipulation being that it contains live fish and plant or rock or both. In spite of the wide scope this gave, all thirteen entries were very similar, but the three appointed judges eventually reached their difficult decision, and the Cup was awarded to Mr H. Berger; Mr M. Perry took second and third places.

Results of the December all classes table show were:

Barbs: 1, Mr Perry; 2, Mrs Reade; 3, Mr Grounds. Characins: 1, Mr Dunkley; 2, Mr Irish; 3, Mr Seaman. Fishless: 1 and 2, Mrs Rowe. Labyrinth: 1 and 2, Mr Dunkley; 3, Mr Grounds. Cichlids: 1, Mr Dunkley; 2 and 3, Mrs Rowe. Catfish: 1, Mr Berger; 2 and 3, Mrs Rowe. Molluscs: 1, Mrs Rowe. Swordtails: 1 and 2, Mr Seaman; 3, Mr Hattam. Platys: 1 and 2, Mrs Rowe. Male guppy: 1, Mr Hattam. Female guppy: 1, Mr Hattam. Tropical plant: 1, 2 and 3, Mr Berger. Coldwater plant: 1, Mrs Rowe; 2, Mr Hattam; 3, Mr Berger. Breeders, egg-layers: 1, 2 and 3, Mr Woodley. Breeders, livebearers: 1 and 2, Mrs Rowe; 3, Mr Hattam. A.O.S. coldwater fish: 1, Mr Grounds. A.O.S. tropical fish: 1, Mr Reade; 2, Mrs Rowe; 3, Mrs Reade. Singetail goldfish: 1, 2 and 3, Mr Berger. Twintail goldfish: 1, 2 and 3, Mr Woodley.

The best fish in the show was a Bristol shubunkin, owned by Mr Berger.

BRADFORD & D.A.S. report a good attendance at their recent main meeting for a film show, given by Mr Taylor of Belle Vue Aquarium. He brought with him six films and some fellow marine enthusiasts from Manchester, and before the show he gave a talk on keeping coral fish in captivity, pointing out where a large public aquarium differs from a domestic set-up. For instance, it was cheaper for him to have a road tanker to collect water from the sea

than to mix up artificial salts! His first film was of the dozen or so salt-water tanks at Belle Vue, and included some views taken behind the scenes. Although some fry had been reared in Germany, Mr Taylor had not been so fortunate, but his next film showed damselfish and clownfish spawning at Belle Vue. The third film of a beautiful tank, owned by a Manchester visitor, showed it to be full of healthy coral fish, including some rare ones. A most enjoyable evening ended with a film, complete with sound, featuring Jacques Cousteau and the crew of the Calypso in 'World without Sun', and members warmly thanked Mr Taylor for his time and trouble.

At a General Discussion, ably led by Mr A. Firth, many topics and problems were raised, including diseases and leeches in the aquarium, but Mr Firth considered the latter to be a danger only to very young fish.

Thirty-nine members and their friends attended the Society's Annual Dinner, at which Mr and Mrs C. R. Wilson were guests of honour. Everybody enjoyed a very pleasant meal, and the highlight of the evening came when Mr Firth presented Mr Wilson with a pewter tankard, and bestowed on him the Society's highest honour, awarded only once before in the club's history—Life Membership. Annual club trophies were then presented as follows; the Thornley Memorial trophy for the highest number of points at monthly table shows was won by Mr A. Firth (26 points); 2, Mr P. Chornley (18); 3, Mr D. Kennedy (16). Mr J. Matley gained 80½ points in the home aquaria competition and was awarded the Sharp trophy; 2, Mr P. Moorhouse (79½ pts); joint 3, Master E. Puskar and Mrs M. Firth (77½).

INSTRUCTION and discussion were the theme of recent meetings of **HOUNSLOW & D.A.S.** Members greatly enjoyed the main feature of the slide show meeting given by fellow member Mr H. Parish. As each slide was shown members were invited to comment or pass on advice on any of the fish kept or bred by them. This provoked much lively discussion, and it was most interesting to note the different methods used in obtaining the successful spawning and rearing of the various species shown, particularly that old aquarium favourite, the temperamental angel fish. An auction of fish and aquatic plants was held, including some very good quality leeri gouramis bred by treasurer Mr H. Woodward. Well-known F.B.A.S. judge Mr H. Towel judged

the table show for characins and cichlids, and card awards were: characins: 1, Mr J. Bannon (78 points); 2, Mr C. Walker (76); 3, Mr M. Alexander (75½). Cichlids: 1, Mr R. Spencer (77); 2, Mr C. Walker (76); 3, Mr D. Brooks (75½).

Aquatic flora was the subject of the lecture given at the following meeting by visiting speaker Mr R. Forster. He covered a wide variety of aquatic plants, and his very interesting talk was accompanied by many beautiful coloured slides of plants grown by him in the ponds and tanks in his fish houses, as well as some slides showing plants growing in natural conditions in their native countries. He also described in great detail the methods he uses to produce the exotic blooms and seeds on many of the rare and beautiful specimens. Thanks for a most instructive and enjoyable evening were extended to Mr Forster by chairman Mr R. Scurry, on behalf of club members. The table show for livebearers and A.O.S. catfish and loach was well supported and contained a good selection of the various species as well as some of the more unusual catfish. F.B.A.S. judge Mr C. Harrison awarded the following points: Livebearers: 1, and 3, Mr A. Loveday (79½ and 76½); 2, Mr H. Pratt (77). A.O.S. catfish and loach: 1 and 2, Mrs R. Brewer (77 and 76½); 3, Miss N. Brewer (76½).

SOUTHEND, LEIGH & D.A.S. report a most successful year. The Society has 115 paid-up members including 34 joint memberships, which means that they have some 149 aquarists on their books. The year has included a successful Open Show, successes at The AQUARIUM SHOW, at inter-club shows and, at the completion of the year, a very healthy bank balance. Mrs Hilda Halsey attended the A.G.M. to present the 1970 award trophies: Halsey Memorial trophy for highest points at table shows, Mr T. Clark; Southchurch Cup for second highest, Mr R. D. Orford; Abbot Cup, highest junior points, M. Chapman; Brookes Shield I, first mini-tank, Mr A. Russel; Brookes Shield II, second mini-tank, Mr T. Clark; Barnes Oake, best breeders egg-layer, Mr G. Coe; Cocoonation Cup, best breeders livebearer, Mrs V. Buzlon; Duboisson Cup, best characin, Mr T. Clark; Len Willis Memorial Cup, best killifish, Mr B. Dunn; Giles Cup, home furnished, Mr K. Lane; Jones Cup II, best coldwater, Mr T. Clark; Saunders Cup, second coldwater, Mr T. Clark; Jones Cup I, members best fish, Mr T. Clark.

In Brief

... SECRETARY of the newly formed **BILLINGHAM A.S.** would welcome any advice on running an aquatic club. The Society already boasts 45 keen aquarist and fish-keeping members, and it aims to aid fishkeeping, and to teach and learn more about fish. Meetings are held on alternate Friday evenings, in Billingham Community Centre, Anyone interested should contact secretary, Mr J. Patterson, c/o 20 Knole Road, Billingham, Teesside TS23 3BN.

... **PORTHCAWL A.S.** was formed last August, and now has 38 members. Anyone interested in joining can be sure of a warm welcome, and should contact secretary, Mr J. Roberts, 33 Marlipit Lane, Porthcawl, Glam., or go along to a club meeting held at The Pies Hotel, Porthcawl, every alternate Tuesday evening.

... AT the December committee meeting of the **FEDERATION OF SCOTTISH AQUARIST SOCIETIES**, held in Falkirk, it was decided, after a long discussion, to accept the letter of resignation that secretary Mr Brian Fraser had to tender because of business commitments. The committee expressed their appreciation, on behalf of the Federation, of the valuable work done by Mr Fraser during his period of office, both in his position as secretary, and as a member of various committees.

... **MR. G. TODD of ACCRINGTON & D. A.S.** received the highest number of points throughout the year in the Society's table shows (70); 2. Mr T. Mallett (33); 3. Mr H. Whitcome (20); 4. Master S. Taylor (15), a very good effort by a junior competing against adults. The highest number of points in the junior section were gained by Master C. Carter. A plaque, donated by Mr C. Whitsay, was awarded to Mr Todd, and members are very grateful for this generous donation. Club judges are: Class A, tropical and coldwater, Mr J. Hodggets; Class A, coldwater, Mr A. Isherwood; Class A, guppies, and Class B, tropical and coldwater, Mr T. Mallett; Class B, tropical and coldwater, Mr G. Todd.

This year the club is determined to win the Churchill Trophy, after coming second against Blackpool and Lytham last year.

... **BEDWORTH A. & P.S.** first meeting in 1961 took the form of a fancy dress party with a difference—the costumes had to be associated

with fishkeeping. Over 130 members and friends who were present pronounced the evening a huge success. The best junior costume was that worn by 5 year-old Judith Haynes, who portrayed a red devil cichlid; best adult costume was devised by Mrs Jean Skidmore, who went as a white worm.

... The **ROTHERHAM & D. A.S.** All Winners Show in November was judged by Mr K. Coulton from Sheffield. Cups were awarded to Mr W. Downing of Thyberg for the highest number of points gained throughout the year, plus a plaque for winning the All Winners Show. Second was Mr D. Jones from Mexbro', and he received a plaque, as well as the Cup for the most entries throughout the year.

THE FEDERATION OF SCOTTISH AQUARIST SOCIETIES has conferred upon Mr George Reid an honorary presidency of the Federation. This is a life appointment, carrying full voting status at Federation and Council Meetings, and may be conferred upon those who have rendered outstanding service to the F.S.A.S. Mr Reid was a Founder Member of the Federation, its honorary secretary from 1962 to 1963, vice-president from 1965 to 1967 and president from 1967 to 1970. At the Federation's A.G.M. at the end of last year Mr Reid emphasised the growth of the hobby in Scotland, from the days of the very first organised Aquarium Club in Britain—the Scottish Aquarium Society started in Glasgow—through the 'Forties when there were only two clubs in Scotland up to the 32 or more organised Scottish societies that there now are.

... **QUIET months for HASTINGS & ST LEONARDS A.S.** recently, with only one meeting each month. An all-time record attendance of 66 was obtained at auction night. Mr J. Greig won first and second places in the table show for sword-tails; 3. Mr B. Reed. 'Any Questions' night again drew a large attendance. Questions were varied and interesting, and provoked some controversial answers. There was also a visit from an East Sussex pet-shop owner who took with him a good supply of fish for sale, a mutually beneficial arrangement which enables those who are unable to travel in search of fish to purchase good specimens. Perhaps the highlight of the past two months was the welcome arrival of the long-awaited club badge!

... **CHAIRMAN of HAVANT & D. A.S.**, Mr N. Davis, opened the Society's first A.G.M. with some high praise for its achievements during its first year. There are already well over 50 paid-up members, and table show judges have complimented the club on the number of entries and the quality of the fish. Trophies have already been obtained for some classes, and details of awards are as follows: best fish of the year, Mr S. Webster; highest pointed coldwater fish, Mr D. Stokes; highest total points for table shows, and best in breeders class, Mr S. Crabtree; best livebearer, and best catfish, Mr C. Beets; best characin, Mr N. Franklin.

... AT a recent meeting of the **GOLDFISH SOCIETY OF GREAT BRITAIN** Miss D. Morris lectured on the genetics of the pseudo-matt, mock metallic, strain which is present in her singletails. The next quarterly meeting of the Society will be held on Saturday, 17th April, at Farnedown School, Tooting, at 2.0 p.m.

... **SECRETARY of YEOVIL & D. A.S.** is pleased to report that the mystery of the missing fish was solved at the club's meeting. There was a record entry of 47 fish benched by 40 members, in the table show for a.v. tropical or coldwater fish, which was organised in four sections, as follows. Cichlids and coldwater: 1. Mr V. Collins (78 points); 2. Mr D. Phinn (75); 3. Miss D. Forward (74). Livebearers and characins: 1. Mr F. Lange (79); 2. Mrs Wright (78); 3. Mr K. Forward (76). Gouramis: 1 and 2, Mr P. Sealy (80 and 78); 3. Miss Bush (77). Catfish and loaches: 1. Mr D. Baker received the best fish in the show award with a red-tailed black shark (85 points); 2. Mr T. Perry (82); 3. Mr K. Wright (80). Society judge was Mr D. S. Langden.

... **BELLE VUE A.S.** members thoroughly enjoyed their January meeting, which opened with a slide show and tape recording given by Mr J. Kelly. Then the club awards for 1970 were presented: member of the year, Mr F. Cobb; senior show member, Mrs W. Heap; junior show member, Master G. Woodfinder. Fish of the year was a Jack Dempsey owned by Master F. Cobb. Table show results: Seniors: 1. Mr F. Cobb; 2. Mr G. Thompson; 3. Mr G. Roberts. Juniors: 1. Master L. Roberts; 2. Master G. Woodfinder; 3. Miss G. Thompson.

... A **READER of 1938**, attempting to start a new society writes: "Anyone interested in joining a Society in **MAIDSTONE?** If so, please contact Mr K. Bovis, 45 Woodside Road, Maidstone, Kent."

... **BASINGSTOKE & D. A.S.** have held their first meeting at the new venue at the Horse and Jockey. Mr L. Jordan of Bracknell, whose personality and family are always welcome at club meetings, gave members the benefit of his experience in a talk aimed at the beginners to the hobby. Members hope that their activities in 1971 are as rewarding as last year's when they enjoyed increased membership, a successful open show, an excellent programme, and also won the Three Counties League. Table show results: catfish: 1, Mr D. Walls; 2, Mr A. Blake; 3, Mr A. Marshall, a.o.v. 1 and 3, Mr M. Strange; 2, Mr H. Gough; rovinces: 1 and 3, Mr P. Cook; 2, Mr R. Hsley.

... **WHEN** Mr Short and Mr Callow of **BATH A.S.** judged an a.o.v. tropical class at a **BRISTOL A.S.** table show, club members found their explanation of judging techniques most helpful. It was stressed how, other things being equal, a

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good fully grown 2 in. fish can beat a half-grown 5 in. specimen.

... **PLACINGS** for 1970 in the annual competitions at **LEAMINGTON & D. A.S.** were: Member of the Year: 1, Mr F. Underwood (183); 2, Mrs J. K. Smith (137); 3, Mr E. Clarke (70). Mr Underwood achieved the highest points in the Show Trophy competition (2, Mrs J. K. Smith, 193; 3, Mr E. Clarke, 48) and in the Breeders Trophy (38) (2, Mr J. K. Smith, 7; 3, Mrs C. Beard, 5). The Jack Clarke trophy results for the best in show awards were: 1, Mr E. Clarke (4); 2, Mr F. Underwood (2); 3, Mr P. Taggart (2). Eric Clarke won the Junice Trophy with

70 points (2, Duncan Beard, 67; 3, Phil Taggart, 43). Mrs J. K. Smith won the Home Aquaria competition (2, Mr Heath; 3, Mrs R. Gunthorpe).

... **NOW** that members have formed a photographic and sound recording section, a new venture is to be tried by **TOTTENHAM & D. A.S.** in 1971; whereby members will make films and tapes of their own choice. Table show winners during January were: First round knockout: 1, Mr K. Massey; 2, Mr T. Tiffary; 3, Mr L. Clements. Characins: 1, Mr B. Macantsionnaich; 2 and 3, Mr S. Mole. Guppies: 1, Mr B. Macantsionnaich; 2 and 3, Mr R. Smith. Lots of lectures, film shows and table shows are planned for this year and old and new members are very welcome at meetings on the second and fourth Thursdays at the T.L.R. Club, High Road, Tottenham, N.17. Arrangements for the open show on 11th and 12th April are in full swing and the club looks forward to a great success.

Meetings and Changes of Officers

ACCRINGTON & D. A.S. Chairman, Mr H. Smith; vice-chairman, Mr A. Isherwood; secretary, Mr C. Whalley; treasurer and show secretary, Mr N. Taylor; president, Mr M. Sofer; publicity officer, Mr G. Todd (107 Bold Street, Accrington). Meetings: second Wednesday in month, The Royal Oak Hotel, Meadow Street, Accrington.

BATH A.S. Secretary, Mr P. Allsopp (33 Brookfield Park, Bath, BA1 4JG). Lots of new members wanted; all welcome at future meetings on the fourth Thursday of each month at the Belvoir Castle, Lower Bristol Road, Bath, at 7.30 p.m.

BILLINGHAM A.S. New Society. Secretary, Mr J. Patterson (c/o 50 Knole Road, Billingham, Teesside TS25 3HN). Meetings: alternate Friday evenings, 7.30 p.m., in the Community Centre, Billingham. New members most welcome.

BLACKPOOL & FYLDE A.S. Change of meeting night and venue. Meetings: from February, 1971, every second and fourth Monday, 7.30 p.m., at The Kings Arms Hotel, Talbot Road, Blackpool (500 yd. from bus station). Secretary: Mr G. Howard (58 Stamford Avenue, Blackpool; phone 42676).

BRISTOL A.S. Secretary: Mr J. Avery (14 Melbury Road, Bristol BS4 2RP).

CASTLEFORD & D. A.S. New secretary. Mr W. Eyre (41 Leatham Crescent, Paoston, Featherstone, Yorkshire).

EALING & D. A.S. Chairman, Mr R. C. Mills; vice-chairman, Mr D. Crier; secretary, Mr C. Rainbow (25 Lynton Road, Chesham, Bucks.); treasurer, Mr A. King; show secretary, Mr R. Sallis (3A Lady Margaret Road, Southall, Middlesex).

ENFIELD & D. A.S. Vice-president, Mr C. Wain; chairman, Mr J. Coleman; vice-chairman, Mr J. Grace; secretary, Mrs Barker; treasurer, Mr Barker; show secretary, Mr D. Watts; assistant, Mr L. Spooner;

P.R.O., Mrs P. Godling (278 Lonsdale Drive, Enfield, Middlesex).

FEDERATION OF SCOTTISH A.S. President, Mr N. Bates; vice-president, Mr T. Cochran; secretary, Mr D. Fotheringham (12 Royal Park Terrace, Meadowbank, Edinburgh EH8; phone 031-661 2477); assistant, Mr K. Jamieson; treasurer, Mr R. Ferguson; show manager, Mr D. Fotheringham; assistants, Mr S. Naismith, Mr S. Allan.

HAMSTEAD & D. A.S. Chairman, Mr K. Pyle; vice-chairman, Mrs K. Hsley; secretary, Mrs V. Birch (102 Hamstead Street, London, N.W.2; phone 01-485 7493); treasurer, Mr A. Silman; show secretary, Mr T. Casak; assistant, Mr M. J. Bradford; P.R.O., Mr R. Green.

HAVANT & D. A.S. Chairman, Mr H. Amridge; secretary, Mr N. Davis (50 Stanstead Crescent, West Leigh, Havant, Hants.); treasurer, Mr G. Fisher; show secretary, Mr V. Hunt; show manager, Mr P. Shurbutt; social secretary, Mr J. Porter; table show secretary, Mr C. Beet.

HOUNSLOW & D. A.S. Meetings: The Public Hall, Isleworth, Middlesex, alternate Wednesdays at 8.00 p.m. Secretary: Mr D. J. Woodward (24 Unbridge Road, Harworth, Middlesex; phone 01-398 2456).

HUDDERSFIELD TROPICAL FISH SOCIETY. Chairman, Mr J. Brook; vice-chairman, Mrs P. Robinson; secretary, Mr J. R. Wilde (999 New Her Road, Oatley, Huddersfield, Yorks.); treasurer, Mr A. Hasdon; show secretary, Mr M. Jessop.

PORTHCAWL A.S. New Society. Secretary, Mr J. Roberts (33 Mulpit Lane, Porthcawl, Glam., S. Wales) Meetings: The Pines Hotel, Porthcawl, alternate Tuesdays, 7.30 p.m. New members welcome.

ROEHAMPTON A.S. Chairman, Mr J. Waller; secretary, Mrs P. Lambourne (7 Wheeler Court, Plough Road, London,

S.W.22; phone 01-223 2630); treasurer, Mr F. Furnace; show secretary, Mr D. Lambourne.

RUNCORN A.S. Secretary, Mrs V. Skellis (38 Shaw Street, Runcorn, Cheshire). Meetings: alternate Tuesdays, 8.0 p.m., at The Boat House Inn, Mersey Road. New members welcome.

SHEFFIELD & D. A.S. Chairman, Mr R. Senior; vice-chairman, Mr H. Burton; secretary, Mr K. Cohen (35 Delves Avenue, Sheffield S12 4AA; phone Woodhouse 4477); assistant, Mr R. Walker; treasurer, Mr J. Dicken; social secretary, Mr Haggibottom; show secretary, Mr F. Toyn; assistant, Mr E. Stanton; librarian, Mr M. Burton; P.R.O., Mr D. G. Richardson.

STRETTFORD & D. A.S. President, Mr R. Wilde; chairman, Mr E. Whitmar; vice-chairman, Mr R. D. Hunt; treasurer, Mr M. J. Parlor; secretary, Mrs B. Babington (11 Farnside Avenue, Higher Irlam, nr. Manchester); assistant, Mr P. Rogers; show secretary, Mr A. Sear; assistant, Mr A. Gleave.

TOTTENHAM & D. A.S. Secretary, Mr K. Massey (72 Westward Road, Chingford, London, E.4; phone 327 7814). Meetings: second and fourth Thursday of month, T.L.R. Club, High Road, Tottenham, London N.17.

TROWBRIDGE & D. A. & P.S. Chairman, Mr D. Hayter; secretary, Mrs S. Scudamore (44 Trowbridge Road, Bradford-on-Avon, Wilts.); treasurer, Mrs P. Hunter; show secretary, Mr C. Perry; librarian, Mr W. Patrick; project organiser, Mr M. Sarnoda; press and P.R.O., Mr W. Burton. Meetings: second Tuesday of each month, at the Axe and Cleaver, Southwick, nr. Trowbridge, Wilts. All newcomers, novice or otherwise, especially welcome.

YORK & D. A.S. Chairman, Mr A. Turner; vice-chairman, Mr M. Donaldson; secretary, Mrs H. Simons (28 Abbotford Road, Hull Road, York YO1 3EE; phone 42180); treasurer, Mrs E. I. Taylor; show secretary, Mr P. Carey; editor, Mrs A. Turner; librarian, Mr B. Gwent; P.R.O., Mrs R. Rumbold. Meetings: The Royal Signals Club, Wenlock Terrace, Falford Road, York, second Tuesday of month, 7.30 p.m.



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Dates for Your Diary

6th March. F.B.A.S. Assembly, Conway Hall, Red Lion Square, London, W.C.1, 2.30 p.m.

7th March. F.S.A.S. CONVENTION (Boats, AYKSHIRE A.S.), Ravenspark Academy, Irvine, Ayrshire.

14th March. BELLE VUE A.S. Open Show, Openshaw Boys Club, Crossley House, Ashton Old Road, Openshaw, Manchester 11.

14th March 1971. TOP TEN A.S. Open Show, Huddersfield Town Hall.

14th March. MEDWAY A.S. Intra-Club Show, Dane Court School, Watling Street, Gillingham, Kent. Schedules, Mr J. Marshall, 97 Dargata Road, Chatham, Kent; phone 62712.

2nd April. THURROCK A.S. Open Show, Thameside School, Arthur Street, Grays, Essex. Schedules: Mr D. C. M. Durrant, 22 Kingman Road, Stanford-le-Hope, Essex.

4th April. BRITISH KILLIFISH ASSOCIATION General Meeting, Squirrel Hotel, Wellington, Somerset. Details from Mr W. Davison, 2 Shaw Road, Tipton, Staffs.

4th April. HOUGHTON & D. A.S. Open Show. Schedules available in February 1971 from Mr H. Leighton, 102 Albany Drive, Houghton-Le-Spring, Durham.

4th April. NELSON A.S. Open Show. Civic Centre, Stanley Street, Nelson. Schedules from Mr B. Tate, 12 Priory Close, Bingley, Yorks. BD16 4HU.

11th-12th April. TOTTENHAM & D. A.S. Open Show. Haringey Sports Council, Drill Hall, High Road, Tottenham, London, N.17 (opposite the Span Ground). Schedules, Mr R. Thomson, 3 Reynolds Court, High Road, Tottenham, N.17.

17th April. BATH A.S. Open Show. St Peter's Church Hall, Lower Bristol Road, Bath. Schedules available mid-February.

17th April. G.S.G.R. Quarterly meeting. Farndon School, Tooting, London.

17th April. AQUARISTS' FILM SHOW organised by HEMEL HEMPSTEAD A.S. and Kodak Ltd. Kodak Ltd., Maylands Avenue, Hemel Hempstead, Herts. Tickets from Mr A. Tullis, 21 Fir Tree Close, Hemel Hempstead.

18th April. MEDWAY A.S. Open Show. St John Fisher School, Ordinance St., Chatham, Kent (1 min. Chatham Station). Schedules, Mr J. Marshall, 97 Dargata Road, Chatham, Kent; phone 62712.

18th April. M.A.L. League Show. The Sports Centre, Granby Street, Loughborough, Leics. Details from Mr M. L. Farnon, 12 Silverton Road, Loughborough, Leics.

18th April. SHEFFIELD & D. A.S. Open Show. Change: now to be held in the

Technical College Gymnasium, at the corner of Leopold Street and West Street, Sheffield 1, Yorks.

24th April. INDEPENDENT A.S. first Open Show, Islington Town Hall, Details from Mr R. Islip, 85A Colneyhatch Lane, London, N.10.

24th April 1971. BURY & D. A.S. Open Show. Church House, The Wyde, Bury.

25th April. FREELANCE A.S. Open Show. All Saint's Church Hall, Surrey Square, Walworth, London, S.E.17. Details: Mr J. E. Stamp, 72 Redman House, Lang Street, London, S.E.1. Phone 01-497 4966.

25th April. STOCKTON-ON-TEES A.S. 21st Open Show. St Peter's and Paul's School, off Durham Road (A177), Stockton-on-Tees. Schedules: Mr W. Rowman, 2 Seaton Close, Fairfield, Stockton, Teesside.

25th April. YORK & D. A.S. Open Show.

24 May. HENDON & D. A.S. Open Show. Brotherhood Hall, West Hendon, N.W.9. Schedules from Mr T. Glass, 10 Adelaide House, London, W.10.

24 May. TROWBRIDGE & D. A. & P.S. Open Show. Nelson Haden Girls School, Trowbridge. Show schedules mid-February from Mr C. Ferry, 122 Trowbridge Road, Bradford-on-Avon, Wilts.

24 May. ASHTON-U-LYNE & D. A.S. Open Show. The Jubilee Hall, Dukinfield, Cheshire. Schedules: Mr P. Fittin, 9 Bostwick Terrace, Richmond Park Estate, Ashton-under-Lyne, Lancs.

24 May. CROYDON A.S. Open Show. Stanley Hall, South Norwood Hill, S.E.25. Schedules from Mr A. J. H. Smith, 3 Hindhead Way, Wallington, Surrey.

24 May. DUKERIES A.S. third Open Show. Winifred Porteous Technical Grammar School, Sparkes Hill, Workop, Notts. Show secretary, Mr M. Woodley, 26 Silverdale, Dinnington, Nr Sheffield.

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26th May. DERBY REGENT A.S. Open Show. Sherwood Foresters Recreation Centre (Normanton Barracks), Gmaston Park Road, Derby (follow R.A.C. 4276). Schedules from Mr R. T. Bull, 35 Queens Drive, Littleover, Derby.

26th May. OSRAM A.S. Open Show. The Recreation Hall, Refuge Street, Shaw, Oldham, Lancs. Schedules, Mr J. E. Shaw, 33 Refuge Street, Shaw, Oldham.

25th May. UXBRIDGE & D. A.S. Open Show. Meadow School, Royal Lane, Hillingdon, Uxbridge. Schedules: Mr N. V. Lee, 45 Alresdale Road, Ealing, London, W.3.

16th May. MERSEYSIDE A.S. Open Show.

22nd May. SOUTHBEND, LEIGH & D. A.S. Open Show. Liberal Hall, Clarence Road, Southend (proceed towards sea front from Southend Central Station, first right, first left). Details: Mr R. D. Oxford, 5 Rimbeth Chase, Leigh-on-Sea, Essex.

22nd May. YEovil & D. A.S. Open Show. Grass Royal Secondary School, Yeovil. Schedules from Mr A. E. Rendell, 77 Freedom Avenue, Yeovil, Somerset.

22nd May. CORBY & D.A.S. Open Show. Schedules from show secretary Mr D. A. Page, 78 Crapin Street, Rothwell, Northants.

22nd May. COVENTRY POOL & AQUARIUM SOCIETY Open Show. Foleshill Community Association, 777 Foleshill Road, Coventry.

23rd May. LOYNE A.S. first Open Show. Gregson Institute, Moor Lane, Lancaster. Schedules from Mrs M. Norris, 70 Wyresdale Road, Lancaster.

23rd May. NORTHWICH & D. A.S. Open Show. The Scout Hall, Cuddington, nr. Northwich. Starting 12.00-2.0 p.m. Show schedules from Mrs D. Thorne, 28 Whitegate Road, Winford, Cheshire.

24th May. CATFORD A.S. Open Show.

25-26th May. Sixth INTERNATIONAL GUPPY SHOW (FANCY GUPPY ASSOCIATION), Glebe Farm Community Centre, Stretford, Birmingham. Open to non-F.G.A. members.

26th May. COVENTRY P. & A.S. Open Show. Foleshill Road Community Centre, Coventry.

31st June. F.B.A.S. Assembly, Conway Hall, Red Lion Square, London, W.C.1.

6th June. LINCOLN & D.A.S. Open Show. Drill Hall, Broadgate, Lincoln.

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continued from opposite page

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