Contents include:  
Breeding *Badis badis*  
Fish House Specialisation  
The Elephant-nosed Fish  
*Cryptocoryne wendtii*  
Tropical Marine Project  
Breeding the Bumble Bee Goby  
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Comments and Quotes

- Getting them out of dark corners
- Difficult times

Therapy for the Skulkers?

THOSE who wish that their shy, timid or nocturnal favourites would dispel themselves a little more often in the front of the tank may yet see the day when a simple purchase from the aquatic dealer will ensure that no fish will again lurk in a dark corner. For many years experimental work has been proceeding on a substance known as scotophobin, isolated from the brains of experimental rats induced to fear the dark. By the application of electrical shocks the animals have been made to shun a dark box and run into a light one (which is, of course, quite contrary to their natural instincts). The material obtained from the brains of these rats has already been injected into mice, in which it instilled the same fear of the dark. Now, the NEW SCIENTIST reports, the researcher, Dr George Unger of the Baylor College School of Medicine, Houston, U.S.A., has injected scotophobin into goldfish. The reaction of the fish is rather more complicated than that of the mice but the experiment shows clearly that, after the injection, goldfish tend to shun a dark enclosure in their tank. The treatment could certainly save our slumbering claritas much fewer adornment of the top of his head with gravel whenever his tank lights have to be switched on.

Too Much of a Good Thing

EXPANSION of trade reflecting growth of an interest is a good thing; expansion of services without such growth may not be good. The latter situation appears to apply in the aquatic trade at the present time. Too many importers, too many wholesalers, too many retailers, too many dabbling at being fish traders, and a market that has slowed in growth and is showing a reduction in spending—this cannot be good for anyone. Those who know the aquatic trade from old are saying this and we believe it is as well for consumers (who form the largest proportion of our readers) to realise it too. The consumer may enjoy being wooed under such circumstances of intense competition for his custom, but any apparent advantage here will be temporary only. We don’t suggest that it is up to consumers to sort out the aquatic trade’s own peculiar problems but we would advocate, in the interest of a healthy trade in the future, a little steadfastness in placing orders. Certainly not to shelve any inefficient, uncaring or out-of-date business but as acknowledgment of past good service where this has been provided and to encourage some stability in the present state of affairs, which could well worsen rather than improve in the foreseeable future.
How to Make 'em Last

READING Personal Comment in the February issue and Arpee's comments on the life-span of fishes reminds me of my own small band of 'odds' and 'ends' that were taken over when I inherited the remnants of a neighbour's fish collection nearly 5 years ago. As I am really a pond fish man I didn't want the fish and had no interest in them but decided to give them a home until they died. They were spread amongst two or three old tanks and include two metynnis, a black widow, two blind cave tetras, a cherry barb, a couple of cardinals and the odd male guppy. They receive, as I admit guiltily, very little attention. The tanks are given a quick 'do round' about once every 3 months, they are fed—but somewhat haphazardly—and they appear to be going to live forever! They have at last won my grudging admiration for sheer tenacity but I am now restraining myself from lavishing any more attention on them as I can't help wondering if the fact that I have given them such little attention might not account for their success.

Grantham, Lincs.

D. MARTIN

Try Ours

IN reply to the criticisms of MAAS organisation of open shows, I should like to extend, to Mr Kerridge of Harlow A.S. in particular and to all your readers in general, an invitation to attend GKN Pond & Aquarium Society's Open Show (details from Mr K. Rowley, show secretary, 156 Wolverhampton Street, Darlaston, Staffs.). We feel the best answer to his just criticism would be if he were to see at first-hand that the criticisms he levelled are not applicable to all Midland open shows. See you all on 4th June.

P. R. O., GKN P. & A.S.

A. T. WRIGHT

Entente Cordiale

I AM pleased to announce that we have established what we believe to be a unique relationship with a French aquarists' club. We are in correspondence with a Monsieur Patrick Lancien of the Association Aquariophile de Rouen, exchanging notes on club activities etc. We hope to arrange a meeting with him in the near future.

Pete Watson

Vice-chairman, Anson Aquatic Club

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

How Caesar Keeps Warm

WITH reference to Mr P. Sloane's letter (PFM, February), 'Heating for Big Fishes', I also had this problem of heating a large tank with silly short heaters. I heated a 48 in. by 18 in. by 18 in. with two 200 watt heaters with an outside thermostat—the load is too great for an inside one. This made the heat very concentrated around the heater, which was too hot to touch by hand. I must mention that this tank is in an entirely unheated bedroom facing north. After much searching I have now fitted two new 200 watt heaters that are each 22 in. long. These spread a gentle heat the complete length of the tank and do not startle a large fish if it comes to rest near the heater. My snakehead Caesar, smashed quite a few smaller ordinary heaters, but seems quite happy with the new ones (these bossy fish!). I use three plastic heater holders to each heater, which makes them quite secure. These heaters are W. & D. Aquarium Heaters of Rochdale, Lancs.) and come in two sizes: 17 in. in wattages 100, 125, 150 and 22 in. in wattages 150, 200 and 250. Nowadays the trend seems to be for bigger and bigger aquaria, so let's get the shopkeepers stocking equipment to match.

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(MRS) SYBIL HEDGES

Mrs Hedges' Caesar is the reigning Supreme Champion fish of 1971 (FBAS Supreme Championship), seen by TV viewers and visitors to The AQUARIUM SHOW at the Royal Horticultural Society's Hall last October.—EDITOR.

Water for Mollies

MR F. W. Coles in his article of positive tips for beginners (PFM, February) leaves out one or two vital points. Firstly he says that 'mollies are found in both brackish and completely fresh water'. This is only true up to a point—he does not emphasise that there are two distinct species of mollie. The first, Poecilia sphenope, is the species of which the black variety is widely kept. It is doubtful whether this is a brackish water fish, but many

Continued on page 305
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LETTERS

Continued from page 408

people advocate, and this is my personal experience, that a little salt in the water keeps them in best condition. The second species is Paezella vaflora, which comes from the coastal regions of Yucatan and is therefore most emphatically a brackish water fish. Commonly known as the sailfin mollie, this is a far more beautiful fish than the former and it would be a pity if purchasers buy it only to see it rapidly lose condition in freshwater.

Secondly, Mr Cole says that rainwater should be used as some of the replacement for water loss. Considering that sulphur dioxide is the main cause of industrial pollution, this could be dangerous in many regions and it is also necessary to watch what sort of roof, through what kind of piping and in what kind of container the rain water is collected. Pure rainwater is often very difficult to get hold of.

I would also question the wisdom of not using any form of aeration. Most of the occupants of our tanks come from moving rather than stagnant bodies of water, especially the tetras which most beginners go in for. This ties up with another point about what Mr Cole says concerning the siphoning off of mulm. He does not mention anything about plant growing in the article and mulm should be available for the plants to convert to food. Most beginners like plants in their tanks and therefore the use of an undergravel filter provides aeration, filtration, helps the plants receive their food, decreases siphoning time and enables that extra fish or two without danger of overcrowding. Most beginners are very uncertain on this point so to avoid the common, and perhaps expensive, mistake of overcrowding a quiet pump is a sound investment at about £1.35.

Lastly the price of stocking a large tank with both fish and plants is exorbitant. £5 can easily be spent on plants to provide a decent background and a further £3 on fish (working at the very conservative estimate of 150 average per small fish). Therefore, besides all the difficulties of installing a large tank (a 4 footer is almost impossible on your own—I tried!) and assuming most beginners go in for, pretty fish, a 2 foot tank is quite adequate and all that is necessary—the money saved on the larger tank (and all the associated large fittings) can be spent on a far more beautiful display.

I do not think a temperature gradient is necessary when keeping the majority of fish offered for sale, let alone those the beginner is likely to buy.

Epsom College, Surrey

M. FURNISH

What's New?

New U-G Filter Design

BIOLOGICAL filtration, involving the use of under-gravel filters, has received renewed attention from aquarists with the realisation that in the marine tank it is perhaps the simplest and least troublesome way of maintaining healthy tank conditions for the coral fishes showing hypersensitivity to water pollution. To the two distinct types of undergravel filters already well known on the aquatic market is now added a third, the Algarde Biological Undergravel Filter (Algarde, 4018 Ripple Road, Barking, Essex). It consists of an ABS opaque grey plastic base plate that is moulded in longitudinal corrugations, the spaces between these interconnecting with two corner positions, into either of which the air-lift tube can be fitted. Narrow slots cut transversely across the "trenches" of the corrugations allow the water to pass to the air-lift tube after traversing the biologically-active gravel or crushed coral bed (at least 1½ in. depth is recommended) above the plate. A broad flange around the base plate provides an effective seal, under the weight of the gravel, with the aquarium base. The clear plastic air-lift tube is approximately 1 in. in outside diameter, with a fitting to receive the air line and, if required, an air stone of suitable size (not supplied with the filter). Two sizes of filter are available; 9 in. by 17 in. (99g) and 11 in. by 23 in. (90g).

Tropical Mural in Colour

AQUARIUM backgrounds have often made heavy use of fantasy in the underwater scenes depicted. For those who prefer a naturalistic approach, Interpret (18-22 Church Street, Docking, Surrey) are marketing a natural colour photographic background mural for tropical freshwater aquaria. A luxuriant growth of plants in their natural greens and reds has been photographed on to stout card, laminated on both sides to minimise damage from water. Approximately 40 in. long by 28 in. wide, the mural can be cut down for use with smaller tanks. Recommended price 95p.
Badis badis—

a Forgotten FAVOURITE

Badis badis

By RUDOLPH ZUKAL

As an aquarist of many years standing I can boast the acquaintance of many tropical fish hobbyists, and I often take the opportunity to visit them; by this means I frequently see fishes that do not appeal to me personally. Yet in most enthusiasts' tanks only the same old well-known varieties, of tetras and similar fishes, are found and one seldom comes across a new type of fish or species. Indeed, many once well-known fishes are rarely seen at all today. Badis badis, from India, can be classed as a fish that has been unlucky in this way. It was imported as long ago as 1904, and a variety, Badis badis baramanicus Ahl, was brought to Europe from Rangoon in 1920. Both fish are about the same size and reach a length of 3 in. They are peaceful, very shy and not very active. I appreciate that most tropical fish enthusiasts prefer to keep the more attractive fish; yet, in spite of the fact that these representatives of the family Nandidae live in hiding and avoid the company of other fishes, their way of life, their frequent changes of colour and their propagation are so interesting that they are worth keeping and observing.

The fish need warm water—minimum 75·5° F (24·2° C). They can be kept in a medium sized or larger well-planted tank and we put floating plants on the surface to produce a subdued light. Badis badis look for hiding places, so we also put flowerpots with the bottom knocked out into the tank or construct caverns out of rocks. The water should be 'old' water and the tank bottom medium soft.

Photographs by the author

Translation by F. MARSH
Although these fish are always hungry and consume great quantities of food they will only eat live foods. The males frequently fight, their fins spread wide, but the fights are harmless. During these battles their colour darkens until they are almost black. The defeated combatant will leave the battlefield, whereupon his colour brightens considerably.

From a friend, who had no interest in breeding the fish, I received three males and a female. I put a flowerpot in a 3 gallons tank and raised the temperature to 79°F (26°C), and then placed all the fish in the tank early one morning. Soon, one of the males was occupying the flowerpot. The others swam around the new home, apparently without interest; but this didn't last long. The two other males paid a call on the flowerpot—and that was what I was waiting for. The display soon started. The fighting instinct of the males increased and their colour became darker and darker.

With fins well spread, the flowerpot owner and another male exchanged blows until the aggressor was nudged aside with a skilful push and promptly

Jaw-tugging was amongst the behaviour shown by the pair of fish (darker fish is the male). The bulging abdomen of the female is easy to see in these pictures.
Before spawning the fish swam close together and around each other within the half flowerpot until finally the lower picture they embraced and the eggs were deposited.

lost his dark colouring. Then, for hours, nothing happened. The occupier of the flowerpot guarded his lodging place; and I removed the other males from the tank. At long last the female approached. At first she was frequently chased off and when she did get near to the male he rammed her. In one of the accompanying pictures it is possible to see how she pushed her belly towards the male (her full paunch can clearly be seen). Up to this point the male kept up his threatening attitude, and darkened almost to black whilst the female’s colouring brightened. There was also some jaw-tugging, in cichlid fashion. The fish moved around each other in a criss-cross movement and I thought that this movement was the spawning prelude. But their behaviour pattern then changed and the male curled his body and tried to embrace the female. They moved around each other and took up some really comical positions. The first embrace was unsuccessful and the female slipped away, but after a time the fish encircled each other and the female was embraced in the manner well known for the fighting fish *Betta splendens*. With this embrace some eggs were ejected. The whole spawning lasted for about 3 hours and I counted about 80 eggs. After the spawning finished, the male chased the female away and he took over the care of the brood. Usually the fry hatch after about 48 hours. The young at first are very delicate, and they must be given the finest powdered food.

Film Show

LAST year the Hemel Hempstead A.S. Show of films for aquarists made and presented by the Belgian film-makers M. Carels and C. Wante proved so popular that many aquarists were disappointed in obtaining tickets. Hemel Hempstead A.S., with the co-operation of Kodak Ltd., have again organised a film show by the same entertaining guests and this is on Saturday 6th May at Kodak Ltd., Maylands Avenue, Hemel Hempstead, Herts. at 7.30 p.m. Tickets (50p each) are obtainable only in advance from Mr. Alan Tuffs, 22 Fir Tree Close, Hemel Hempstead, Herts. (phone: 0442 2857), to whom early application should be made.
TROPICAL MARINE PROJECT—2

The Conditioning Process

Making Haste Slowly

THE freshwater enthusiast who uses undergravel filtration may well stock his tanks to capacity within a week or so of setting them up. In fact most beginners do this within a matter of days, whether they use filtration or not, and so often they get away with it. With tropical marines everything is quite different. Here the simple routine to follow is to give the undergravel system something modest to bite on, within the first few weeks, preferably in between 6 and 8 weeks' time. The micro-organisms in the gravel will have developed to the extent that dangerous substances within the water will not have accumulated in harmful amounts. The starter process is the provision of excreta from one or two of the hardier and more tolerant marine fish such as Dascyllus. The means of knowing how you are getting on is a mimeo test kit; one make is marketed at about £1.50. The way of getting them quickly and surely is by patience, understocking and the highest throughput of air for the filtration system that you can manage. Mr Maurice Stray recommended me to try this technique, and since it seems to work for him, professionally there was no real reason why it should do otherwise for me and beginners generally.

I chose the yellow-tailed blue damselfish and the domino damselfish as my starter fishes in the 15 gallons stainless steel tank set up as I described last month. I must admit to having been highly sceptical about their chances of living for more than an hour or so in the water I had concocted for them, and I was quite prepared to see them live over and expire. The many articles and books I had read on the subject brought one out in a sweat as regards the fine tolerances necessary in terms of both salinity and temperature, to say nothing of pH, which, typically, I had ignored completely. I thus released these two highly nervous and almost colourless creatures and held my breath! The yellow-tail darted straightaway into a coral crevice and the domino gave a slight shoulder and hid behind a filter pipe. Thus they remained, something of an anticlimax, for about 24 hours. This was 26th June. On the following day they took a little nourishment in the form of white worms and a little Tropic Marin flake food. As a counter to disease I had been advised to add copper sulphate solution at the recommended dosage every other day, until three applications had been made (i.e. one full tank dosage on 26th June, another on 28th June and the final one on 30 June).

At this stage I decided to run counter to the advice I had been given. Assuming that the average fishkeeper in my position would be as impatient as I was it was natural that another fish would soon be added, and soon another and then another until full capacity was reached painlessly or until something gave. As the two 'starter fishes' were looking fit I added a percula clown in the face of advice that clowns can be both temperamental and carriers of disease. There was no immediate sign of any trouble and it took food within an hour or so of joining the tank. The following morning it was in such an odd position at the top of the water that I reckoned that just about everything had gone wrong—temperature, salinity, the lot, but when it gobbled down a fair helping of breakfast I got my first message from the marines: that things are not always as they seem to be. By 1st July, the tank having had fish in for a week, there were signs that the inmates were gradually settling down; they were timid, the clown excepted, but there were no outbreaks and no disease was apparent.

I next talked myself into acquiring a neon goby, on the basis that its reputation as a remover of unwanted nitrates from the tank floor made it quite indispensable as this vital stage of events, so near were we running all the time to the 'pollution line'. The tiny scrap of organism I got for a little under £2 convinced me utterly that marines must not only be raving mad but millionaires as well, and since I scored on only one of these counts selling matches on the Embankment was nearer by far than I had ever thought.

The absurdity of the situation was enhanced when I introduced this mate to my new proud tank and found that it was about 30½ white spot and 20½ water. This nearly ended it all. I feverishly added copper sulphate and anxiously studied the other fishes for similar signs of white spot. During this...
time I got on quite familiar terms with this tiny goby through the medium of a magnifying glass, and I saw just what a fascinating splatter he was; then his spots got smaller and he got bigger and I felt somewhat happier about my investment. I was completely convinced about him however, when the domino, which had displayed a capricious appetite, appeared quite out of sorts one evening and gently lowered itself to the floor of the tank and clearly invited the goby to rub its back. The blissful episode that followed, in which the goby was ostensibly carrying out its role of cleaning the other fish, will remain one of my most memorable pleasures in aquaria-keeping. Repetition since then has hardly diminished my wonder at the collaboration between goby and temporary host and one can only hope that the experience is as beneficial and more enjoyable to the participants as it looks from the outside.

By the 9th July I was testing the nitrite content of the water regularly and as it was not, apparently, near the danger level, I decided to take a further risk and introduce a tomato clown. At the same time I noted the presence of a fine maroon clown in the dealer’s tank and reserved it for collection the following week if the water conditions were favourable.

A word at this stage, about the significance of the water tests. The test kit consists of two tubes of different reagents, and if your tank water specimen colours up after drops of these are added only the hardiest of fishes will survive prolonged exposure to the undesirable salts. Sensitive fishes are regarded as butterflies and angels, which should not therefore on any account be used as ‘starter fishes’ during the water conditioning period. It was the tolerance of the ‘in-between’ fishes, such as clowns and perhaps some wrasse, that my experiments sought to establish in some way. As it happened the tomato clown got away to a very good start and took dried food on the evening it was released into the tank.

On 16th July I collected the maroon clown. The water conditions were still tolerable to the test though slightly poorer than on the previous weekend. This fish was rather larger than the others and it took uneasily to its new quarters. It introduced a sort of shimmery into the now familiar clown ‘dance’ and the spectacle was not reassuring. The fact that it refused food was a further danger signal, and it gradually deteriorated during the week. On 22nd July it died very suddenly in a terrible and violent convulsion. I chose to assume that this had been an intrinsically sick fish and decided to continue to add suitable candidates if any presented themselves from within the category that could be regarded as hardy. A superb pink and yellow damselfish and a neon damselfish, both quite small, suggested themselves as reasonable successors and joined the collection on 23rd July. At this stage my supplier looked at me severely and suggested that I should ease up until the 8 weeks stage, by which time the water would have become more suitable. I said maybe and left him shaking his head rather sadly. The water conditions were by this time rather worse than a week previously, though not, still, in the danger category.

The first sign of trouble came within a day or so when most of the fish had what I can only describe as the ‘jumps’. They would suddenly jerk violently and swim off erratically and aimlessly. A distressing and rather depressing spectacle. Only the tomato clown, the yellow-tail, the goby and the pink and yellow damselfish were feeding properly; the percula toyed with bits here and there and the domino and neon damselfish were totally uninterested in the subject. On 26th July the neon damselfish, which seemed to have diminished in size, died after a great deal of shimming and the domino, alive one minute, was dead the next. The state of the water now, at the fifth week, had decidedly moved into the danger area and it was obviously foolish to push our luck any further. So conditions remained until 8th August. There was a state of disquiet amongst the remaining fishes and I was both frustrated by the apparent lack of progress in establishing acceptable tank conditions and not a little fearful that further fishes would succumb to what were obviously seriously deteriorating surroundings. The water tests were uniformly discouraging during this period.

Like Christmas to a small boy, it never seems to be coming any nearer, but dramatically on 9th August there was a marked change. For the first time the water tests gave a colourless reaction, which indicated that the nitrite concentration had been dealt with by the increasing micro-organisms in the gravel. What was more remarkable was the sudden change in habits of the fishes. From a state of communicable indecision and nervousness they suddenly emerged into visible alertness and purpose. They began to feed as though they had just come through a long fast and their colours seemed really to glow for the first time. A further message appeared to have got through to me that marines really can take some punishment and still flourish.

The sight of these ‘survivors’ so evidently having overcome what must have been a pretty unpleasant ordeal was to me quite moving and to some extent made the loss of some fine fishes that much more bearable. I abhor the unnecessary sacrifice of life as, I am sure, do most of our readers. Not the least encouraging part of this process was the fact that a prophecy had come true. As I have a lot of time for accurate prophets I set out at a later stage to validate this for a second time with a larger aquarium. I shall be giving away no secrets if I say at this juncture that I wasn’t disappointed.

The significant aspect of this experiment is that it seems to be demonstrated that this technique can be successful almost to the letter if faithfully carried out. Further, any notion that all fish should be introduced at the same time seems to be blown away. It is dangerous if the range of species included those which, like the butterflies, are sensitive to the conditions that prevail until the seasoning process is complete. It may be noted that no quarantine process was carried out in this experiment. Superficially the copper sulphate preventative treatment made this unnecessary, but whether I should consider this adequate when adding a new damselfish to an old-established tank containing rare and expensive fishes is quite another matter.

We will discuss the matter of quarantine separately, though the reader will no doubt have noted
Readers’ Queries Answered

Weather Loach

I have a small Japanese weather loach and would like to know what to call it on. Its weather forecasting seems to have been restricted so far to saying itself in the gravel.

Minogurus anguillicaudatus is omnivorous but will prefer tubifex and the garden worms. Burying itself in the gravel or sand (or mud in its native waters) is a means of protecting itself from predators and from water’s lower temperatures. It is likely to be more active when the days are off and at night. The reason for the name is that it is said to be one of the loaches particularly sensitive to atmospheric pressure and by its restlessness movements when pressure falls it is supposed to give notice of impending storms hours before they break.

Shallows are Preferable

My garden pond is something like a ft. deep all round. It has no shallow section at all and I am wondering if this means that if I buy some goldfish they will not be able to breed in it.

Lack of a shallow section in your pond will certainly not prevent your fish from breeding, but a shallow shelf actively encourages breeding as goldfish prefer to spawn there. In a natural pond with a gentle slope down to the central depths it is in the shallows that spawning takes place. Lack of a special spawning area at the end or side of a pond also means that it is very much more difficult to control the hatching—it is not so easy to watch for the eggs, to remove them if necessary, or to bar the parent fish from the shallow area once spawning has taken place and so prevent them from finding and eating the eggs.

Breeding Harlequins

I have a very definite pair of harlequins and would like to breed them. Can you give me some tips please?

Many breeders prefer to set up a tank containing half-a-dozen harlequins as a sure way of obtaining good results, but you could be successful with just the two fish provided that they are compatible. Water composition is all important in the successful breeding of these fish; it must be old, it must be soft and it must be acid—so clean rainwater that has been filtered after standing over peat for some weeks previously will be suitable. A temperature of 80°F (27°C) is required and the tank, about the 24 in. by 12 in. by 12 in. size would be suitable, should range that would appeal most to the onlooker yet provide the fishkeeper with still something of a challenge.

I therefore set a £5 limit to individual purchases and developed a plan for the next part of my marine project, still bearing in mind the interests of the aquarist who has made his hobby part of his home and who hopes to charm his family with it and to enable them to share his enjoyment of its pleasures.

To be continued

Pond Breeding

I bought some small goldfish in the early part of last summer. Are they likely to breed this year? They are quite a bit bigger than they were.

Assuming that the batch of fish you bought contained both males and females, and assuming that they have been well fed in your pond, the fish should be sexually mature this year. Not every goldfish develops the organs necessary for the reproductive process by its second summer—this development depends much more upon feeding and husbandry than upon size or age—but in a group of youngsters bought to stock a pond some of them should almost certainly be ready to breed in their second season. This may take place from spring onwards—the increase in the intensity and duration of the light and the rise in water temperature occurring in the early months of the year bring about the development in the fish of the sperms and eggs that will be shed during the breeding months from the end of April to late August. If you want to see some young fish remaining from a spawning you will need to ensure that there are some thick masses of water plants in the pond as shelter for the small fry.
RED, black and gold are a combination that is very pleasing to the eye, a fact not overlooked by those old-time craftsmen in wood and ceramics. Some of the finest half and three-quarter black guppies that it has been my pleasure to see have had an underlying gold coloration.

Now it seems that we shall shortly be seeing such guppies also sporting a red caudal—the work of that well-known combination, Alan Fowlies and Henry Vinall. Yet another success to add to their long list of guppy prowess.

Considering that about 2 years ago these lads lost most of their fish through an unfortunate accident, this promised new achievement seems all the more remarkable and an example to the many beginners and old 'uns alike who say it cannot be done.

I often wonder what those two Londoners would have produced had they not experienced such a setback?

By PETER UNWIN

To those who have often pondered the question why our American cousins have always emphasized colour in their guppies only next to size, I have the answer. I found it when sorting through some old magazine cuttings, an article reporting on the work of a Colorado, U.S.A., scientist, circa 1954.

Researching in the fields of electromagnetism and radioactivity, this learned gent had come up with an interesting, if somewhat hard to swallow theory:

"The North American continent by reason of its geographical location is receiving a considerable concentration of radiation from natural elements. These have a definite bearing on the number of colour variations appearing in the guppy, Lebistes reticulatus, the effects on the colour genes resulting in numerous mutations being reported. A consequence it would seem is that our guppy breeders have a colour pattern potential that will overshadow colour variance in their European counterparts."

Prophetic? Credible? To think that all these years I have been under the impression that it was their emphasis on colour and ours on shape that caused the difference! Funny though, that these 'magic radiations' didn't single out any other fish but the guppy, or was it that our little friends were more numerous?

Poecilia reticulata and *Homo sapiens* share one thing in common: they both have 23 pairs of chromosomes, those thread-like bodies that carry the coded message of inheritance. Chromosomes are only clearly discernible during cell division, when they contract in length to become short, thick rods just a few microns long.

If we are to be successful in the breeding game then whether we like it or not we must understand some of the basic facts of genetics. This discounts the odd top man who claimed any genetic knowledge. They were the exception who seemed to do the right things despite their lack of knowledge.

Unfortunately, many would-be aquarists have not the ideal background—a scientific one—to cope with this subject. They make a genuine attempt to acquire such knowledge but because most of the text-books deal with humans, peas, mice and fruit flies, they come to the conclusion that what works for those doesn't work for guppies.

Guppy inheritance is somewhat specialised but the basic laws apply to everything. I once showed an excellent film made by the 'Bird's Eye' people on Mendel's Law of Heredity—a film that used pea plants to illustrate his experiments. Its explanations and diagrams left the majority of the audience cold, despite the high percentage of expertise present. Yet, when I asked them to see the film again but this time to substitute guppies, many admitted after this second showing that things had clicked into place.

Your local librarian will help you if you explain what you seek. One recent book in the Tutor Text series covers genetics in such a way that you progress only when a thorough grasp of each part of the book is obtained.

When it comes to the disappearing act baby guppies have Houdini licked to a frazzle. Apart from the obvious source of their demise (down the throat of some predatory adult fish), young fry can wiggle their way into spaces beyond our ken.

That column of bubbles may show that the air stone and pump you recently purchased are working well but the rapid ascension of those bubbles in the water produces a whirlpool for young, very young. *Poecilia* and *buffets* those caught in the maelstrom into oblivion.

Sub-gravel filters, especially those not covered by a good depth of gravel, can suck fry beneath their impersonal white plates. Should the guppies survive to reach the airlift tube, the activity here propels them heavenwards towards that happy hunting ground in the sky.

And before those pre-external filter types say 'I told you so!', let us not forget that the delivery tubes of such filters often gather a surface layer of algae, rich in the tiny creatures on which young fish feed. Lured there by a good meal, fry are

Continued on page 516
THE knife fishes of the suborder Gymnotoidei from South America have for many years been attractive to aquarists in an odd sort of way, primarily because of their strange appearance. They have been especially valued by the collector of oddballs as showpieces because of their obviously knife-like appearance, the long, rippling anal fin, which can propel them almost equally well both backward and forward, and a general overall strangeness about their appearances and actions.

The electric eel (Electrophorus electricus), with its devastating wallop, has been the most legendary and widely known of the group, but other smaller gymnotoids have appeared in the aquarium hobby for years. Most have belonged to the genera Gymnotus, Eigenmannia, Hypopomus and Apteromis, because these have generally been the most satisfactory.

Sternopygus macrurus (Bloch and Schneider 1801) is one of the most widely distributed and numerous of the gymnotoids but for some reason is seldom seen in aquaria. Even when it is occasionally seen, its identity is usually unknown, since the species has been neglected in aquarium literature. Although its colour, which is a rather muddy chocolate, is unspectacular, the delicate transparency of the long, constantly rippling anal fin as it tapers sternward has a beauty of its own not found elsewhere. Similar in general features and shape to the glass knife fish, Eigenmannia, with which it shares the family Sternarchidae, it becomes much larger in size, according to Humboldt reaching a length of as much as 3 feet. Linnaeus (Gmelin, J. T. (translation) Linneii Systemae Natuirae, Ed. 13 1788) said it reached a weight of 10 pounds, and it does not seem surprising that the fish is eaten by both natives and travellers. Although Ellis says that Sternopygus is quite difficult to distinguish from Eigenmannia in the field because both fish are not only similarly shaped but have translucent flesh, the specimens I have kept and which came from different sources over a period of several years were always a brownish colour. Ellis did, however, mention that the specimens caught at several places were considerably darker than the others.

Linnaeus wrote: "There are little holes all over the body but principally about the eyes, for letting out a viscous matter", in speaking of this fish which he called 'the long-tailed carapo'. Little could he have imagined the real purpose of these little 'holes', for these are the electroreceptors, the 'antenna system' of an almost unbelievably sophisticated and efficient navigation system which has surprising similarities to radar, although it is really quite different.

Sternopygus macrurus, like other gymnotoids, possesses electric organs. Far too small to be used in defence or predation, as in Electrophorus, the...
Each impulse which is generated by the electric organ of the long-tailed knife fish excites the nerve in each electroreceptor when it is received, causing the nerve to discharge as many as 2-3 impulses. The number of impulses discharged by the nerve depends upon the intensity of the signal reaching it. The fish can alter the amplitude of its signal when more or less intensity of the entire electrical field is required, but objects moving in and out of the field which have a conductivity different from that of the surrounding water will alter the intensity of certain portions of the field. Through a remarkable system of coding and triangulation based on which receptors receive signals of what intensity, **Sternopygus** can not only identify objects or creatures by their electrical conductivity, but even the movements of the object in question can be carefully followed electrically.

Perhaps even more remarkable in its way than the almost unbelievably sophisticated electronavigation system of the long-tailed knife fish is its ability to regenerate lost tissue. As much as one-third of its body length can be lost and will be regenerated in time, skin, scales, nerves and even vertebrae being replaced. All the vital organs are located toward the front end of the fish. Since most of the gymnatooids including this one are at least equally at ease swimming backward as forward, going into an unknown situation tail-first could conceivably be advantageous in their hungry realm!

**Sternopygus**, which is found as far north as Panama, feeds primarily on insects and their larvae in Nature, particularly water beetles. Feeding in the aquarium is most easily and cleanly accomplished with earthworms. The worms may apparently be ignored for the first time or two that they are offered, but they will usually disappear overnight. Like other gymnatooids, this is a nocturnal creature whose activity both physical and electrical will increase greatly at night.

Water conditions don't seem to be too important for this fish as long as the water is clear and not extreme in pH or hardness. A temperature in the range 70-80°F (21-26°C) is suitable, and an individual **Sternopygus** can be easily kept in a well aerated aquarium of 10 or 15 gallons. If the tank is well planted and provided with a few hiding places, two specimens can sometimes be kept together, although they may be quarrelsome. When an individual reaches a length of 12 in. or more it is best to provide an aquarium at least 24 in. in length.

The knife fishes are a fascinating and remarkable group, which are being carefully scrutinized by science because of their abundance of physical innovations. They comprise one of Nature's best examples of adaptive evolution, having achieved their unusual status of form and function after beginning as some type of ancestral characid.
Nearly all small fishes have attractions for
the collector, and for the beginner in particular,
because they have minimum space requirements
and can be overcrowded almost with impunity.
There can be some very nasty surprises, however,
when very young cichlids, for example, are not
recognized for what they are, and are bought in the
mistaken impression that they will grow on very
slowly, if at all. It is nevertheless a fact that young
cichlids are extraordinarily attractive in themselves
and, like other young fishes, exhibit a brilliance
and quality of form which do not always improve
with age. Enthusiasm must therefore be tempered
with some skill in judgment before buying
members of the cichlid family as the mature
forms are often incompatible one with another
(even within the species) and the strain on your
accommodation can become quite intolerable.
One may well look around and decide to keep
some of the dwarf cichlids, and this is an
experience in itself. On the debit side, though,
there is the feature that fishes in this group are
not very long-lived, and this brings into the limelight
the smaller members of the cichlids proper.
Perhaps the first consideration in deciding on one
of this group is whether it is peaceful or not, and
after this come size, colour, breedability and so on.
I had a few vacancies in one of my tanks recently
and when I saw a nice batch of fin-sized keyhole
cichlids in a local dealer’s tank, I took the plunge
and bought a trio of them.

Aequidens maroni is not one of the most colourfull of the family and cannot be compared with the
mouth or the jaw. It nevertheless has a most attractive coloration, light fawn and pinkish tones contrasting agreeably with the black vertical band passing through the eyes and with the well-known black elongated spot towards the tail which gives it the keyhole name. It is a nicely rounded
fish which never seems to assume the gossiness of
some of the elderly specimens of other species,
and it thus manages to conceal its age rather well.
Delicacy therefore is the characteristic that it
seems mostly to display, and the books will have
in it that it is a shy and rather retiring creature and
not easy to breed. The latter may well be true, but mine have, never struck me as being timid and
once they had transferred from quarantine to their
permanent quarters, they became much in evidence
and put on size and colour.

They are all that is claimed for them in terms of peacefullness and they have never even looked
upset at a plant, which is where a change con-
considering that they are members of the cichlid
family. Their progression through the water is
very much start-stop, every 2 or 3 in., and they
rather remind me of sun beetles busily but erratically exploring their domain. Like most other
cichlids they propel themselves in a completely
dignified fashion, excepting, of course, when they
are attempting to escape from a pursuer.

With all these attributes they seem ideal for the
beginner at cichlids, but they can certainly be
mixed with other fishes such as catfish, sharks
and the like: any of the bigger non-predatory
fishes would act as good foils. There are no
apparent problems as regards feeding and packet
food is taken as readily as anything that wriggles.
Those I have seem to have monstrous appetites and I never let them indulge to the full for fear of
the consequences. They have shown no signs whatever that they wish to spawn and I cannot
differentiate the sexes so far. The only social
activity of any note is that two appear to have the
mildest of grudges against the third, but as this
has never developed into anything like a real
cichlid feud I have left well alone.

I do not intend to make any effort to induce
them to breed, but I am delighted that I intro-
duced them as they are living up to their early
promise. I had originally seen them as possible
companions to my brackish fishes in slightly salt
water—the chromides are often chosen for this
role—but I am not sure now that I want to separate
them from my angels and festoons. The temptation
remains quite strong, all the same, because the
keyhole has something of the contours of many of
the commoner marines such as the damsels and
the clown, so the part may yet come to be played at some time in the future. Whatever I
may decide to do I shall be thankful that I can
count on this little cichlid to provide gracefullness
and charm in any surroundings, and that it will
do so ungrudgingly and without a display of
temperament. We all have room for fish like these.
came away prepared almost to believe anything, so successful had been the propaganda of those fateful years. This made easier meat than usual for advertisers, especially those whose products had even a suspicion of a wartime ancestry, and indeed for the most part there was much to be thankful for. However, just as the war itself had shattered many of our earlier misconceptions, so did our faith in the new technology sometimes take more of a strain than many would have cared for.

My own moment of truth in this connection came when I saw one of those magnificent British films of the fifties in which particular one was told the horrible story of metal fatigue—quite a new concept for most of us. Even now I can recall the terrible tension of the last half hour in which the aircraft in which we were cinematographically travelling was due to disintegrate any moment. Such undermining of faith in apparently timeless things was in itself a godsend, since the isolation of the cause of so many accidents redirected scientists and technologists on yet further steps towards greater safety.

It is with this background that I pose the question as to just how much confidence we should rightly have in this new generation of silicone rubber sealing agents as means of holding together aquaria containing many hundreds of pounds of water (mainly salt). Well may the Editor of PFM, in a recent Book Review, have wished for more information on this subject: certainly I would hope to see something authoritative quite soon which adequately explains the process and attempts a life-expectancy forecast for the technique. It is, without a doubt, one of the most revolutionary and interesting developments in aquarium construction for very many years, but for me at present it is more of a scratching on the surface of something more fundamental. One must be fair, though. A few years ago one would have scoffed at the notion of sticking together bits of glass, unfurred, with any confidence at all that the resultant container would hold water. Now, almost everyone is doing it.

My cause for concern rests on the fact that time has not yet played with this new substance in quite the same way as its bench tests. I have no doubt at all that the most careful trials have been undertaken, but I do ask for greater evidence than has so far been evident. I have little doubt that these comments will cause fury in some circles. Remember, though, that polythene sheeting was once sold for pond lining, and did we ever hear that this would crack at the waterline after just a season? Twelve years ago I invested £30 in a Plastolene pond liner, which is fabric coated with plastic, and nobody at the time suggested that this would begin to crack up after 10 years or so, but it has done so. Then there was the drug thalidomide and like accidents. None of them, excepting possibly the polythene pond liner disaster, could have been foreseen in the normal and reasonable course of production, but they have all been the causes of some regret.

For my part the mere notion of several hundred gallons of water held back by a frameless tank is an agonising one and I wouldn't have such a risky affair in the house; and since the cost, as compared with that for a framed tank for well-tried sources, is not all that much lower, I just wonder whether we are not just going overboard for technique for its own sake. I have an old-fashioned feeling that if any of my now outdated framed tanks is going to expel its contents on to the floor it will share the secret with me beforehand in one of many known ways. How these newcomers communicate their intention I do not know, but I wonder what the trade think about the life of these types of aquaria?

Guppy World

Continued from page 512

drawn into the box filter often to perish unnoticed amongst the filter media.

The golden rule is to keep aeration and filtration out of the nursery tank. Provide plenty of plant cover for the fry, especially the floating varieties, and don't be in too much of a hurry to 'count your chickens'. In this Eden young guppies can happily survive until their size makes them obvious. The cannibalistic mother will soon tire of trying to catch them in a jungle of floating plant.

To B.B., Aberdeen:

Yes, there is a specialist guppy group called 'The Paul Hahnel Society'. It was formed in the U.S.A. in 1958 with the late guppy king as titular head. All those who joined the club agreed to raise their guppies according to Mr Hahnel's methods—no hormones, chemical foods or any artificial means to promote growth or to enhance coloration.

The 'Bill' whose observations were quoted in a paragraph in Guppy World on page 412 of PFM for January is Mr Bill Myers. Unfortunately the lines identifying Mr Myers and introducing him as an aquarist who 'knows a thing or two when it comes to swordtail varieties' were omitted by a printer's error.
Breeding the
BUMBLE BEE GOBY

By J. LEE

The coloured bands of the
turquoise bee goby (Brachy-
gobius sanitosis) give the
usual name to this fish.

THERE comes a time to each one of us in this
hobby when we seem to get a craving or fever to
own and breed a particular fish. This happened to
me some years ago when, wherever I travelled,
there was evidence of a glut of small bumble bee
gobies. I soon took a great fancy to them and, as
there were plenty to pick from, I was able to
handpick my purchases. After a few months of visiting
shops in different cities and collecting gobies from
them all I had built up a nice shoal of these amusing
little fellows—about three dozen in all.

They were housed in a 3 ft. by 15 in. by 12 in.
angle-iron tank furnished with a 2 in. layer of
washed silver sand. Along the back and round the
edges I placed an assortment of small Westmoreland
rocks interspersed with fancy pieces of blue and
green slate; here and there amongst the rocks
were placed half a dozen small 3 in. flower pots.
Dominating the centre of the tank was a very large
aquatic sword plant and sweeping out to both
sides large sagittaria intermingled with small
stumps of dwarf vallisneria. I kept the tank at a
temperature of 75°F to 78°F (24-26°C).

The fish were fed over the months on a good
mixed supply of live foods, such as whiteworms,
sticklebacks, bloodworms, Grindal worm, daphnia
and cyclops. The last-named food they seemed to
relish particularly and would fill their bellies to
bursting point—they also greedily ate large amounts
of whiteworms. I further added to their diet
meals of scraped meat and liver and, after feeding
them on this menu for a few months, it was hard
to tell which were females and which were males
as they all looked so robust. When I did eventually
put them out I had a lot of trouble sexing them
and made one or two mistakes, so that I tried over
a dozen times to spawn them without success.
I very often found that I had put two females out
and on one occasion two fat males. I was getting
very confused until one day I thought of getting
above the tank and looking at them from the top
as they moved slowly about the aquarium. It was
very amusing to see them as their colouration
made them look like a swarm of wasps. I found
this method a lot better for sexing them—I
looked for the yellow band round the head, which,
in the males, carries a far deeper colour than
that of their mates.

Brachy gobius sanctosan is a native of Borneo
and usually only attains a length of about 1½ in.
Although to some it might not seem a beautiful
fish it is certainly a very striking little fish when
in good condition. The coloration can be described easily enough—the body is yellow with three black bands; the first passes down from the forehead and through the eye over the lower gill or cheek, the second band includes the dorsal fin and goes through the base of the pectorals and includes the ventrals, and the third band starts in the second dorsal and crosses the body into the anal fin; there is also a large patch at the caudal base. The yellow band or, as I used to call it, the ‘scarf’ round the head is the one that has more intense colour in the male than in the female.

I browsed through several books and magazines only to come up with the information that although bumble bee gobies were not too difficult to spawn the difficulty lay in getting the eggs to hatch and that there was a high risk of losing the fry after a few weeks. I was soon to discover the truth of this. Bumble bee eggs are very apt to develop fungus, so that when spawning is completed a dye is needed even to try to save some eggs, such as the addition of some 3% solution of methylene blue, when artificial incubation is attempted.

After about a dozen failures I started to prepare for what I thought was further punishment. All attempts in large tanks had failed and, in any case, as all my large tanks were in use, I used a perspex 18 in. by 10 in. by 10 in. tank that was painted black on the outside but had the front left clear. This tank was disinfected with potassium permanganate and Dettol and well cleaned out. Aged tap water (depth 4–5 in.) was used with a final 1 in. depth of fresh tap water over a ½ in. layer of boiled and cleaned deep brick-red sand; a 3 in. earthenware flower pot was scalded and scrubbed and placed on its side just off-centre of the tank. When tested the water reaction was about neutral. I added 2–3 spoonfuls of salt and then allowed the water to stand and settle for a few days. Just before the breeding fish were introduced into the tank I added a thick growth of weighted down young Indian ferns about 4 in. in height. The temperature was stable at 78 °F (26 °C).

I selected a fat female full of roe and a good male with high colour. The pair were put in the tank late at night, and the top of the tank was shaded from excess of light with a sheet of newspaper. In the afternoon of the following day I noticed that the female had made a hole in the sand beneath the flowerpot and was hiding under the flowerpot, while the male was active about the tank but took no notice of her at all. At the end of the third day I peeped into the tank and was greeted with rather an unusual sight. There must have been about 200 eggs—not on the roof of the flowerpot as they usually are, but scattered throughout the tank, all over the sand and plants and on the pot. Even at this early stage it appeared to me that about half of the eggs were white and with fungus. Under a strong lens I could see that some were in small clusters and seemed to have a fine thread attached—they reminded me of the shapes of a hen’s egg, tapered at one end.

I took the female out first and left the male a bit longer. I added methylene blue without delay and then darkened the tank. I could see that a large number of the eggs were developing fungus even with the dye in the water and I was beginning to fear that it was another failure, with a complete loss of eggs. But this time I was rewarded. The eggs hatch in 5–7 days according to temperature and, after a week had gone by, I was delighted to see some free-swimming—not many, about 50, but enough to keep me satisfied. They were starting feeding on Infusoria and egg yolk, they brine shrimp, and with light aeration they seemed to be doing well.

Then after 3 to 4 weeks things started to go wrong. About five fry were seen twisting round and round at the top of the tank, very pale and white-looking. It was hard to tell at their size what the symptoms were but the fish had a fuzzy look and it appeared to have been fungus. I tried in vain to save them but eventually they all died. So for the first time after years of breeding all kinds of fish I finally ended with no fish at all. But bitter disappointment and failure comes to aquarists as well as great success and, after all, advancement in this hobby involves trial and error and perseverance.

This rather squat-looking little fish with its large head and big mouth has a docile look but must be put under the heading of fin-niper; however, they are not very active swimmers and they move about the tank very slowly and spend long periods stuck to the glass—and I have had no trouble mixing them with other species.

AS in the four previous Shows, at The AQUARIUM SHOW ’72 (27th-29th October) the Society Tableaux section will be specially featured. Prizes of £25, £50 and £15 go to the societies with entries placed first, second and third by vote of all competing societies; every society staging a Tableaux receives £5 towards expenses. Societies can choose any theme appropriate to a show open to the public; this year a larger area of staging is being allotted—88 ft. frontage by 4 ft. 6 in., viewable from three sides. Furnished aquaria and/or aquascapes from individual members or from the whole society can be entered in the appropriate competitive classes and staged as part of the Tableau. Full details will be sent next month; for these or for further information please contact the Show Organiser, P.O. Box 564, Garrett Lane, London SW17 2NY.
Out of the Usual Run:
Elephant-nosed Fish

By
J. ELIAS

Photograph
by the author

Gnathonemus petersi

This much-prized fish of the family Mormyridae comes from an area from the Congo to the Niger. Even in Nature it grows only to a length of some 20 cm. (23–25 cm.) so it is a perfectly suitable fish to keep in an aquarium.

The lower jaw of the tube-shaped mouth is drawn out into a tiny trunk. This is curved downwards and the fish uses it to explore the ground. The eyes in its tapered head are quite undistinctive and indeed have the appearance of being velvet covered. Its elongated, dark grey-brown body slopes away sharply at the sides and there, two fins along its body, it carries a darker, white-striped diagonal marking. Dorsal and anal fins are placed well back along the body and from their stout peak gradually narrow towards the tail. Each side is a mirror reflection of the other. The tail fin is deeply forked.

Gnathonemus petersi closely resembles G. elephas. The latter has similar diagonal stripes on each side though these make a more oval marking. Its body is rather more robust and its upper lip is also partly drawn out as well as the lower. Some species of mormyrids have an additional means of orientation with the aid of an organ that produces electric impulses of a very low voltage (of the order of 0.01 volt).

The first time I received any G. petersi the fish died from the journey but on the second occasion I was to be pleasantly surprised. For the first fortnight they ignored all food offered to them while settling themselves in and familiarising themselves with their new surroundings. After the initial 2 weeks they started taking the live foods that were being offered to them (of a suitable small size) — I did not attempt to give them dried food. The water composition did not appear to be critical and a temperature between 74 and 77°F (23–25°C) proved suitable.

It was with these fish that I witnessed an example of behaviour that I have only seen once before in the aquarium — and that time it was with Botia macrocephalu. One day I saw that one of the elephant fish was lying on the floor of the room (they are great
Economics of the OPEN SHOW

I DON'T know who it was that thought up the oft-quoted saying about some being born great, some achieving greatness and some having greatness thrust upon them. Whoever it was he could have had in mind those misguided individuals who undertake the organising of their society’s open show; the sentiments fit them admirably, for they could experience a modicum of all three.

The person who shows a profit at the first attempt is hailed as great, obviously a born show organiser. If, on the other hand, the show is a flop, nobody says anything because they are afraid of being landed with the job themselves, so the first man carries on and makes a success of the next one. He has achieved greatness and discovers he has got himself a job for life; he cannot lose it through failure and, by being successful, it is passed upon him year after year.

Seriously though, it is a most exciting job and calls for a great many attributes, perhaps the most important being that indefinable quality known as organising ability. Some are blessed with it, yet there are others who would be incapable of organising a sit-down strike in an armchair factory. Assuming then that he does have it, he should be orderly and methodical, he should have a finely balanced sense of proportion in matters relating to finance and he should have a certain degree of clerical aptitude. Thus equipped he sets out on his thankless task.

Finding a suitable venue can be a major problem and, of course, one that varies according to the location and facilities available to the society concerned. If the biological aspects of fishkeeping are put before the Educational Authorities, and the schedule includes classes for children, they will very often provide a room free of charge. Normally, however, this involves discussion by the Education Committee before going on the agenda for the next Council Meeting and can be quite a lengthy procedure.

In any case they will not open up on Sunday because the caretakers insist on their day of rest and, as Sunday seems to have become the accepted day for open shows, I find from my own experience that Church Halls are the best. They are large enough without being expensive and are invariably well equipped with facilities for providing refreshments. You cannot, of course, have trade stands and the conducting of the raffle has to be done in a furtive manner, bringing with it an air of conspiracy.

A touch of drama can be introduced by using ticket-sellers who speak out of the sides of their mouths.

If the judges you want live near at hand so much the better (their expenses will be less), although, in spite of the criticism often showered upon this much-maligned body, I cannot accuse them of being mercenary. They usually keep their demands to a minimum where society open shows are concerned.

So, having fixed the venue and judges, the schedules can be prepared and distributed. These should cost next to nothing. Most societies have their own duplicator and to run off a sufficient supply, with the details neatly and clearly set out, is a simple procedure. Anything more elaborate is unnecessary, adds little to the society’s prestige and can have a damaging effect on expenditure. Postage rates being what they are, distribution should be limited to societies within 50 or 60 miles radius. It is unlikely that those further afield will be prepared to make the journey for an afternoon show.

The main danger of overspending lies in the ordering of the trophies. One can easily get carried away by the attractiveness of some new design; but the show committee must not lose sight of the fact that the outlay is governed by the number of exhibits that can be reasonably expected. There are many who advocate the soliciting of donations from leading manufacturers; these are usually willing to give aquatic appliances or dried food in furtherance of their sales. This, of course, saves a great deal on expenditure but, to offer a prize card with a drum of food resting on it as though on a plate, brings to the occasion a great loss of dignity, particularly if the Mayor is presenting the prizes.

I attended a show some years ago where all the prizes had been donated by local traders. There was everything from kitchen utensils to bedding, and even an oven-ready chicken. Imagine your prize chicken, which you have nurtured for so long to bring into peak condition, being awarded a chicken. It’s nearly as incongruous as a champion Rhode Island Red taking home a box of kippers. No, I think the majority of exhibitors appreciate something they can keep, suitably inscribed to commemorate the occasion, and point to with pride in the years ahead.

By FRED CAMPBELL
It is unlikely that the entry fees will cover the cost of the room, the judges and the trophies, so the deficiency must be made up in other donations. Perhaps the real money-spinner is the refreshment stall. People get hungry and, in any case, will nibble sandwiches and sip cups of tea just to while away the time during judging. Children, too, of which there are usually an abundance, will make frequent demands for potato crisps and orange drinks. Care must be taken, however, not to oversell the spending potential of the visitors. At my own Society's show last year it was decided to make available a limited number of hot meals consisting of a liberal portion of meat pie and peas plus a slice of bread and butter and a cup of tea. We sold them, but at 12p a time the price proved unpopular, yet people were willingly paying somewhere in the region of a shilling less for a couple of sandwiches and a piece of cake, demonstrating that these, at a reasonable price, are the most popular victuals to provide.

Then, of course, there is the good old stand-by, the raffle. Here again I am in favour of three good prizes rather than twenty small ones donated by members. The reason for this being that it takes a considerable time to draw out twenty tickets and hand out twenty prizes and people do not like hanging about. Some 5 minutes after the last class has been judged the raffle should be drawn and the prize cards be ready for distribution. This constitutes the major factor in stabilising the economy for future years. Your visitors will spread the news of your efficiency, come again next year and probably bring many more with them!

**Fish House Specialisation**

**By F. W. COLES**

Although people who keep fish houses usually advise beginners not to buy too much of one thing or too much of that etc. for their community tanks, when one looks at their own fish tanks they do not appear to carry out their own suggestions. True, there is a much greater knowledge of fishkeeping evident, and the tanks are clear and well maintained, but what do they hold? Usually a few tanks of larger, harder fishes, kept for exhibition, and the rest a mixture of egglayers, livebearers etc. without any specific plan of campaign being evident. In short: a community aquarium split up into a number of tanks.

There is no reason at all why any hobby should not be run on a well-planned basis without losing enjoyment in the process; rather, more enjoyment can be obtained in a well-ordered scheme, and without many of the usual disasters, too!

Perhaps the best way of running a small fish house would be to specialise. Not like some of the dog breeders do—`Specialist breeder of bloodhounds, corgis, spaniels, beagles, daschunds etc.`—which is frankly ridiculous, but to keep to one, or sometimes two, varieties, one being complementary to the other. But if we are going to look at our efforts realistically we have first to decide the actual objective we have in view. If it is the show bench, once again (racing the breeds of some of our judges), more success will be obtained with large fish than small ones, and if you decide to keep a large variety then guppies would seem to be a complementary kind to go with them, as the surplus fry would help in breeding. Many of these large fish would not be bred by the aquarist owning, amongst other things, to the restricted size of his tanks, and breeding guppies or other livebearers could have an interest of its own. There is no reason why egglayers should not be used instead, other than the fact that a steadier supply of fry would probably be more suitable for livebearers; that is, of course, if proper precautions were taken to keep the fry from being eaten by the parent.

If a small variety is to be kept and bred for exhibition, the choice of fish is far more critical. To a breeder, the classes he is interested in, besides the variety class, are of course the breeders' and pairs' classes. Many of the smaller varieties more or less rule themselves out of consideration because they become transparent in an exhibition jar and lose their colour. Exhibitors are often told that judges will make allowances for this, but most exhibitors are not that ingenuous, and prefer not to risk it, so many more satisfactory varieties being available. Again, in the breeders class (whether four or six for FNAS events) it is not very profitable to choose a variety which loses half the marks for difficulty before judging starts, particularly as some of the varieties listed as difficult are as easy to breed as some of the ones classed as easy. So care in choosing needs to be given in this respect. There is no question, though, that a small breeding establishment, with tanks specifically arranged for spawning, rearing and maintaining the adult stock will be more successful than any haphazard arrangement, and more exhibition fish will certainly be kept. Moreover, young fish will usually be available in reasonable quantity for the breeders' classes as they come along. The exchequer could also be assisted by the greater throughput of youngsters available for sale if a suitable outlet can be obtained.

One cannot rear reasonably large quantities of fish unless a steady and reliable supply of food is obtainable. In a specialist establishment the necessary foods for fry rearing will be Brine shrimp or brine shrimp, or brine shrimp only, depending, of course, on the variety of fish kept. For the adult fish a white worm colony or two (or more, depending on the size) will usually be kept, and as an addition to brine shrimp, micro worm can also be cultured for the youngsters.
Cryptocoryne wendtii  A Plant in

By K. RATAJ

Photographs by RUDOLPH ZUKAL

This plant belongs to the arum family (Araceae) and comes from Thailand. It is an amphibious-growing species with a leaf-stalk approximately as long as the leaf blade, and it is one of the bigger species of Cryptocoryne, growing up to 8 in. (20 cm) in height. The leaf blade may be 4 in. 6 in. (10-15 cm) long and up to 2 in. (5 cm) wide, having an oval base drawn out to a long petiole. The upper surface may be olive-brown to red-brown, or green with darker striping; the lower surface, as a rule, is green to brown-violet. The leaf blade tends to show undulations, particularly at the edges.

Cryptocoryne wendtii is a very variable species with at least five varieties not so far categorised. The basal variety (green, broad-leaved) grows up to 8 in. high (20 cm); the blades in its emersed form are green and dark striped and in its submersed form are olive-brown with a darker lower surface. The narrow-leaved variety of this green-coloured plant reaches 6 in. (15 cm) in height with blades only 1 in. (2.5 cm) wide.

The red, broad-leaved variety grows to 8 in. (20 cm), with blades 2½-3 in. (6-7.5 cm) wide and this plant is perhaps the most decorative form of this species, with the upper and lower surface of its leaves a dark red-brown. Its narrow-leaved variety is similar but its leaves are only 4-5 in. (10-12.5 cm) long and 1 in. (2-5 cm) wide.

Finally there is the variety that comes into the shops under the commercial name of 'C. radula hirta'. This is an intermediate form, its leaves only 4 in. (10 cm) long and 1½ in. (2.5-3.5 cm) wide with both surfaces of the blades olive-green or olive-brown, dark striped in the emersed form, red-brown under water.

The inflorescence is usually only 2 in. (5 cm)

Top picture: submersed form of C. wendtii with leaves showing conspicuously waved edges

Middle picture: submersed form of C. wendtii, of the broad-leaved green variety

Bottom picture: the red variety of C. wendtii in the submersed form
Five Guises

Left: the twisted blade of the inflorescence of C. wendtii seen in close-up.
Right: Narrow-leaved variety of C. wendtii growing underwater

long, though on rare occasions it may reach 3 in. (7.5 cm). The blade of the inflorescence is twisted and never opens fully. It is red-brown in colour with a darker purple-brown throat to the spathe.

The plant can be classed as one of the easily cultivated species. Like the other amphibious Cryptocoryne it can be easily propagated and could be said to be one of the more common aquarium species (and one that is a lot more decorative than many of the others). It will stand subdued as well as direct illumination and survive falls in temperature to 59 F (15 °C), though it does, of course, grow best at temperatures between 68 and 77 F (20–25 °C).

Meetings and Changes of Officers

ANSON A.S. Chairman, Mr A. Wood; secretary, Mrs A. Taylor (24 Priory Park Road, Wembley); treasurer, Mrs R. How; vice-secretary, Mr T. Butler (24 Poplar Avenue, London, N.W.3); vice-chairman, Mr P. Watson; assistant show secretary, Mr R. Bullock. Meetings: every Wednesday 7.30–9.30 p.m. Anson Hall, Anson Road, Edgware, London, N.W.3.

BOREHAM WOOD & D.A.S. Chairman, Mr R. Stearns; vice-chairman, Mr R. Burrows; treasurer, Mr B. Woodbridge; secretary and P.R.O., Mr J. Criswell (64 Milton Drive, Boreham Wood, Herts); show secretary, Mr D. Harris (37 Kenilworth Drive, Boreham Wood, phone 210937 [1945]). Meetings: every second and fourth Monday at The Community Centre, Alden Lane, Boreham Wood, Herts. All welcome.

BOURNEMOUTH A.S. President, Mr Jim Scott-Morgan; chairman, Mr R. Coote; secretary, Mrs B. Matier; treasurer, Mr L. James; show secretary, Mr J. V. Jeffery; P.R.O., Mr J. J. Jeffery (24 Brampton Avenue, Southbourne); Bournemouth. Meetings: New Hall, Kimon Community Centre.

BRADFORD & D.A.S. President, Mr G. Fairclough; vice-president, Mr J. P. Charley; acting secretary, Mr J. P. Charley (24 Spencer Avenue, Great Horton, Bradford 5, Yorks; phone Bradford 317769). Meetings: Mr E. J. Brown; social and B.F.P. Mr B. Northrup (3 Alma Street, Cotton Heights, Bradford 4; phone 34943).

BRISTOL A.S. President, Mr H. Jagi; vice-secretary, Mr J. Philpott; treasurer, Mr W. Hunt; registrar, Miss H. Morgan; secretary, Mr H. C. R. Thomas (17 Green Park, Redland, Bristol 26); B.F.P., meetings: second Monday of month, 2.45–p.m. Bishopston Parish Hall.

BRITISH ICHTHYLOGICAL SOCIETY. Secretary, Mr C. M. Sharman (44 Stanborough Gardens, Welwyn Garden City, Herts); editor and librarian, Mr W. Bullen (6 Green Vale, Welwyn Garden, Herts.); treasurer, Mr J. H. Carlin; secretary, Mr G. E. Greaves (14 Helensford Avenue, Southborough, Tunbridge Wells). Meetings: New Hall, Kimon Community Centre.

CARSHALTON & D.A.S. Chairman, Mr R. McGonigle; secretary, Mr B. Thomas (38 Durnford Close, Carshalton, Surrey); show secretary, Mr E. Wilson.


CLAPHAM A.S. New venue. Now at Carisbrooke Residential Club, 4 Northside, Wandsworth Road, London S.W. Meetings: 7.30 p.m. every second Tuesday in March. New members welcome. Please ring Mrs Evans, 27/28 Balfour Road for details.

COVENTRY POOL & A.S. President, Mr R. Brumfield; chairman, Mr E. Shadlow; secretary, Mr C. J. Green (36 Cecil Road, Coventry); show secretary, Mr B. Higgin; treasurer, Mr J. Shipton; editor, Mr R. Patterson. Meetings: every second Tuesday, Foleshill Community Centre, Foleshill Road, Coventry.

EALING & D.A.S. Chairman, Mr P. G. Mann; vice-chairman, Mr J. A. Hedley; secretary, Mr J. Parks (99a Whitley Road, Acton, London, W.3); treasurer, Mr B.

FIRST published in 1952 as TROPICAL FISH IN THE HOME, this book was republished by Hamlyn with new text and a host of illustrations. The result is a fine opportunity for the artistic talents of Jane Burton (especially), Alan Cupit and David Carl Forbes: the first two did the colour photographs and the latter contributed some 150 most skilfully executed line drawings. The book thus has a modern look, which starts with its impressive coloured cover and continues into the lavish interior with its rather luxurious paper and coloured plates. There the matter ends. The text is very dated indeed.

There is a laboured section on how to make tanks and tank putty. There is a reference to a formula for making salt water in WATER LIFE for 1938. The breeding of neon is still a novelty. Quite apart from this there are some curious statements, such as adding salt to water to correct acidity (and what about the catfish?), and an extremely primitive and unsafe way of hatching brine shrimp. One hardly washes encrypha for an hour, nor is the standard soup solution test for water hardness quite the subject for a book at this level. The insertion of information about marine aquarium is hardly worthwhile in view of the superficial treatment of the subject; it would have been better to omit it altogether. In a general sort of way there is a lot of useful but not very profound information in this book, and the large section on fishes is easy to follow. The plant survey is also attractive, but the drawings make it hard to see what is in the tanks and tank putty. It is a pity the book was not written as a reference work, but as a piece of publicity material for the aquarium hobby. In visual impact is good to excellent and may well catch the jaded eye of someone seeking a new interest. Whether this is a good thing is a matter of opinion. My view is that it is not, and this wedding of the old and the new enhances our respect for neither of the partners to such an ill-chosen match.

ROY PINKS
Transatlantic Topics

By Jim Kelly

During the winter rains, the water in the San Fernando Valley, California, is very soft, not very good for the breeding of such fish as Monodactylyus, yet one fishkeeper, Wesley Wy, living in this area has become an authority on the mono, and has even, despite the soft water, bred them in his tanks.

Following the book, he added salt regularly to his tanks but his experiences showed that after months reached 2 inches the addition of salt was no longer necessary unless the water is very soft.

When tiny, these fish need a high mineral content in their water and Wesley found that marine salt provided it. Spawning have produced up to 60,000 eggs. The period between spawning seems to be entirely at the whim of the female. The fact that the adults eat some of the eggs soon whittles the numbers down to workable amounts.

The eggs will develop faster initially in fresh water but if the water isn’t approximately 15% saline within 40 hours of their being fertilized, the fry quickly die. His conclusion is that the fish in the wild swim upstream into fresh water to deposit the eggs and that these eggs then drift back into brackish water over the next 2 days.

* * *

Since their introduction, all-glass tanks have been finding increasing favour amongst the ranks of the D-I-Y hobbyist, especially since the introduction of safe sealing compounds.

I first came across these aquariums in Kentucky, some 6 years ago, and though I could see the possibilities with the experienced fishkeeper I thought that they were not for the beginner. Having had a few sales since then I now claim the human right to change my mind.

One British manufacturer of both sealer and tanks supplies its customers with instructions, so easy to follow that even I have been able to make all-glass aquaria. However, a word of warning when searching around for suitable pieces of glass. It is very tempting to use plate glass taken from shop windows, especially if you live in a large city undergoing a clearance scheme. This type of glass can be obtained from the demolition people for a song. One correspondent employed in the glass business writes that most windows subjected to strain over the years from passing traffic develop tiny, often invisible cracks. Under the pressure of water in the aquarium they may crack.

Those of us who have experienced the messy business of having a tank leak all over the carpet will understand. If you want to avoid a disaster area in your home use only new glass when constructing your own fish tanks.

* * *

I am a very trusting chap and when my old science teacher told us that water does not run uphill I believed him. But now, according to the Edmund Scientific Company of New Jersey, things ‘ain’t what they used to be’. After their compound is added to water the fluid actually flows up the sides of the glass, siphoning freely into another container. To stop this anti-gravity flow you simply cut through the stream of water with a pair of scissors!

The secret lies in the special additive they have developed with a long molecular structure that acts as a friction-reducing medium. A pinch of this powder added to an aquarium makes the fish slide through the water faster. That should give the compilers of the Guinness Book of Records something to think about. They claim that the Atlantic sailfish Istiophorus americanus can do 100 yards in 3 seconds. Pre-additive era, of course!

* * *

My mail bag often contains comments from individual aquarists on both sides of the Atlantic criticizing or singing the praises of some item of aquarium equipment or fish food. These comments, like oil and vinegar, are inclined by their very nature to enjoy separate existences, but cannot occasion be mixed together with advantage.

Such was the information I received recently on a brand of brine shrimp eggs emanating from a firm called Pioneer Enterprises. So many fishkeepers sang their praises that I felt it was about time we in Britain heard about them.

In appearance they resemble neither the familiar Utah nor San Francisco eggs; for one thing some of them floated and about two-thirds sank, but it took much less salt to make up an efficient mixture—only four tablespoonsful per gallon. Apart from excellent hatching the young, newly hatched nauplii lived up to 3 days in the confines of the hatchery and grew to about double their size.

If you would like to hear more about this product the address I found was: Pioneer Enterprises, c/o Robert Von Hein, Dunsmuir, California 96025 (P.O. Box 918), U.S.A.

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Most people allow for the gay abandon that appears to affect almost all the copy-writers who are set to work on travel brochures, and we hobbyists have also become inured to the claims put out by manufac-
Fish House Specialisation

Continued from page 521

If you care to try micro eel, these can be cultured as well. For a steady supply of brine shrimp to be available it will be necessary to deal with this as scientifically as one deals with the fish, and one of the most reliable ways is to use a small tank with heater and thermostat so that the necessary temperature will be kept at all times and nothing left to chance. If the tank is blacked out in the divided portion where the eggs are inserted, the shrimp will come into the light area and can be siphoned off as required. One thing not to overlook is that if one is feeding daily from such a tank, a daily replenishment of eggs will be needed. Infusoria, if required, can be cultured in a large sweet jar (and without using decaying materials, lettuce leaves etc.) if Liquifry is used for the fry as a starter. Perhaps 3 or 4 days at fish house temperature will be necessary before a usable culture is obtained.

Some people may wish to have plants in their fish houses but this usually needs far more lighting than the fish themselves actually need, with a consequent increase in the cost of electricity used. Tungsten lighting may help to heat the fish house, but it certainly does not save in the amount of electricity used, the reduction in heating current being small, and as bare tanks without plants can be satisfactory for most varieties, why go to this additional expense? Fish needing vegetable food can be catered for in other ways (using duckweed from the community tank in the living room, for example).

One method of dealing with livebearers is to treat them more or less in the same way as your brine shrimp and put a net partition across, to divide off the lighted end of the tank, and have the parents at the darker end. The young fry migrate into the light through the net, and stay there, where the parents cannot reach them. To be fair to them however, most of the livebearers if well fed with live food are not really cannibalistic, and with this method most of the fry can be saved. They are large enough to be taken out with a fine net or fry tube as soon as they are seen, for rearing in a separate tank, which will make sure of their survival.

A well thought-out scheme for fish breeding for exhibition can be more interesting than a dilettante approach to the hobby, and one of the things I have not mentioned is that it usually causes less work in the long run, and it certainly will tend to reduce the disasters or fear of them, which beset most of us.

SECRETARY of the FEDERATION of NORTHERN AQUARIUM SOCIETIES, having received a final decision by the Judges & Standards Committee, have agreed that some confusion appeared to have arisen over models in aquascapes that served a decorative purpose and models that formed an integral part of a miniature landscape. Any attempt to define the two classes of model was open to misinterpretation and it was finally decided that an aquascape containing any model must be shown in the Novetly Aquascape Class. This arose from a request for clarification of the definition of aquascapes by delegates from Omron A.S. at the P.N.A.S Council Meeting last year.
FEDERATION SUB-DIVISION NEWS
OF SHOWING CLASS FOR
CICHLIDS

WITH the opening of another competitive season, the Federation has geared itself to meet the demands of societies, and the various departments within the Federation are 'standing by'.

From the Judges and Standards Committee comes the announcement that there is a further sub-division in the Cichlid Classes. Several societies have staged special and separate classes for 'Lake Malawi' or 'Rift Valley Cichlids', and in response to this a sub-division (De) has been set up. The genera pertaining to this Class will be: Cynotilapia, Genyochromis, Pseudotropheus, Hoplochromis, Haplochromis, Melanochromis, Julidochromis, Labidochromis, Lamprologus, and Pseudotropheus. Trophus.

On the trophy side, in addition to the Championship Class trophies there is a growing list of perpetual trophies for award at open shows thanks to societies donating trophies to the Federation for this purpose.

Ties, badges, show jars, class and award stickers, together with publications, complete the picture of services available to Societies and this year's Free Offer is of 100 Exhibit labels, available upon application (together with open show schedule) to the Publications Secretary, The Federation's new Show Stand will visit your show upon request for the sale of ties, badges, publications etc.—details from the General Secretary (K. Pye, 33 Steele's Road, London, N.W. 3) for the booking of the stand.

The Federation will be opening the '72 season with a dinner and dance on 8th April.

CHAMPIONSHIP CLASSES 1972

The allocation of Championship Class trophies to the open shows of Societies who have made applications for these will be announced at the Federation's general assembly on 4th March. The full list will be published in Federation News next month. Individual winners in Championship Classes will be eligible to enter their fish in the supreme Championship 1972 at The AQUARIUM SHOW in London (27th October-28th October); the owner of the supreme champion holds the FBAS Council Supreme Championship Trophy until the end of 1973.

RE-CONSIDERING and that it was a pity that some societies had dropped the 30-day ownership rule. The South Western Group would like to see this rule reintroduced at least to counter the bought-the-same-day entrant.

RECORD ENTRY OF 1,075 AT SHERWOOD A.S. SHOW

SHERWOOD A.S. wish to thank all the exhibitors who attended their second Open Show and made it the success that it was with a record entry of 1,075. The standard of fish was excellent and the six judges had the fearsome task of selecting card winners from very large classes of fish. Competition was very keen with 46 societies and 105 independent entries competing for the many trophies and prizes, especially Sherwood's own original Robin Hood trophies, which were very popular with the exhibitors. Special thanks go to the judges, Mr K. Colton, Mr A. M. Deckin, Mr A. Abdy, Mr G. Rhoden, Mr G. Sibson and Mr B. Inman. The only regret of Sherwood members is that, being so few in number, they are all too busy on the day organising the show to enter their fish in competition.

Trophy winners were: The Mansfield Pest Store Rose Bowl for best fish in show (marine, emperor angel, 85 points) Mr W. Goodwin of N. Straits A.S. The Margaret Igo
trophy for best cichlid, Mr G. C. Harrigan (Scarborough). The Juko Igloo trophy for best livebearer, Mr B. Stabler of Hull. The R. Clarke trophy for best junior entry, R. Anchers, N. Staffs. Pet Supplies trophy for best characin, Mr G. Thickbroom, Castleford A.S. The Ken Carly trophy for best breeders eigleggers, Mr J. Lee, independent. The Downey shield for best breeders livebearers, Mr and Mrs Cohen of Castleford. The Harrison trophy for best anabantoideus, Mr J. Rhodes, Scunthorpe A.S. The Huckle Kilifish trophy, Mr J. Stevenson, York A.S. The D. Sewell shield for best catfish or loach, Mr A. Gregory of Hadon A.S. The A. R. West shield for best barb, Mr and Mrs Williams of N. Staffs A.S. Mr J. S. Hall of Aireborough A.S. was the entrant both with most entries and most awards. The society with the highest points was Castleford A.S. (2), N. Staffs A.S. (3), Aireborough A.S. (4), Hadon A.S. (5).

**Livbearewers**: Guppies: 1, Mr K. L. Brown (Scarborough); 2, Mr S. Simpson & Mr H. J. Headford (Harrogate); 3, Mrs C. Mannion (Hull); 4, Mr H. Clark (Scarborough); 6, Mr M. Allen (Altrincham); 7, Mrs M. L. Brown (Castleford); 8, Mrs M. J. Bowler (Belle Vue); 9, Mr J. S. Hall (Aireborough).

**Characins**: Small: 1, Mr J. R. Hopkins (Scarborough); 2, Mr M. Allen; 3, Mr J. Brook (Huddersfield); Large: 1, Mr G. Iddon (Wakefield); 2, Mr H. J. Headford; 3, Mr N. Wood (Barnsley).

**Cichlids**: Small: 1 and 3, J. & R. H. Hemphill (Leeds); 2, Mr G. C. Hynes (VC Warrington); 4, Mr V. Knowles (N. Staffs); 5, Mr D. Robertson (Darby Report); 6, Mr J. A. Whitby (Aireborough); 7, Mr M. J. C. School (Doncaster); 8, Mr J. R. Lee (Doncaster).

**Catfishes**: Small: 1 and 2, Mr J. Spearman (Leeds); 3, Mr J. R. Lee (Doncaster).

**Tandem**

**In Brief**

**Mrs W. ATKINSON of HARROGATE & D.A.S.** won the Unicum challenge trophy for most points in the society's table shown last year (2), Mr M. Leves; 3, Mr D. Taylor. The society is soon to be deprived of the services of member Mrs Shirley Briggs, to whom they have presented a fish book as a token of their thanks for all her efforts on their behalf.

**Newbury & D.A.S.** would like to hear from other societies and would welcome advice on running a successful club. Please contact secretary, Miss M. Banoe, 105 Turnpike Road, Newbury, Berks.

**Large number of PRIVATEERS A.S. members attending the meeting at which Mr J. Molloy, senior, of Keighley A.S., lectured much appreciated the interesting talk he gave on making all-glass tanks (including breeding fish), to which they have presented a fish book as a token of their thanks for all her efforts on their behalf.

**CLUB members Mr R. Cox and Mr D. Calway staged a tape and slide show on the egg development of killifish for fellow members of YEOLIV & D.A.S.** The table show for a.v. livebearers was judged by Mr M. Hibbert and won by Mrs K. Bensell (2), Mr A. Rendell (3), Mr R. Cox (4).

**NEW FOREST A.S. enjoyed a slide show on cichlids and it was agreed that the colours photographed in most of the slides were very true to life. The show was presented by Mr George Dunkley, Mr D. Knapm won the Corydoras class in the table show judged by Mr D. Lane (2), Mr D. Harding; 3, Mr C. Knapm) and Mr R. Hague won the catfish class (2), Mr D. Harding; 3, Mr R. Mennhenut.

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**BRISTOL T.F.C.** table show awards for 1972 have been presented to the following: open, Mr G. F. Parry; novice, Mr Bob Lawrence. The society's programme officer, Mr Mick EUick, presented the Club with an excellent programme for their first meeting in 1972—a slide show on home aquarium featuring slides he had taken of his fish and aquatic plants, was the format. It showed a wide variety of species including marines.
At the presentation of club shields for the year at Whitely Bay A.S., Mr. A. Laid of Blyth won the 30-year-old shield. Mr. R. Mansfield of Whitely Bay the 15-point competition shield and Mr. Mallon received a miniature shield for a previous competition. The club kindly welcomed the wives of some of the members and entertained them with a slide show on fish photography. 

The 1971 reports of the principal officers at the Bournemouth A.S. A.G.M. showed the society to be in a very healthy state with satisfactory finances. A successful open show, varied programmes including slide shows, talks, quizzes with good membership participation, social meetings with other societies and inter-society functions arranged in conjunction with the Association of Southern Aquarists' Societies. Members had also enjoyed coach trips to Alexandra Palace and to the Aquarium Show 1971.

Mr. Brian Baker judged the table show at Anson A.C. for caricara, angelfish and minnows and darters as well as giving a short talk on water. The society look forward to the civic reception to which their president, the Lord Mayor of Brent, has invited them. Club winners for 1971 are: 1. Mr. T. Davies; 2. Mr. J. Price; 3. W. A. Wood.

Rotherham & D. A.S. were very distressed to hear of the death of Alber Lindley shortly after they had enjoyed a most pleasant evening at his home and Mrs. Lindley when Mr. Lindley judged Rotherham all-winners fish show; and members send their condolences to Mrs. Lindley. The winners to whom Mr. Lindley presented trophies were: 1. Mr. D. Crow; 2. Mr. D. Jones; 3. Master Airon. Mrs. Jones also won the breeders variety with over nine different species of fish.

Society award winners at Coventry P. & A.S. for 1971 are: Hogarth Cup, all classes, B. & F. Hirst; Stoney Cup, trophy, D. Stock; Caudy Cup, coldwater, not bred, Mr. D. Evans; Coldwater Bowl, breeders, B. & F. Hirst; Society Cup, breeders, Mr. T. Maitland; and B. & F. Hirst. 

Luddington Coldwater Cup, pool, Mr. B. Browne; Court plaque, tropical home aquaria, Mr. and Mrs. Holiday Society Cup, coldwater home aquaria, Mr. B. Browne; Clarke plaque, best fish, Mr. D. Evans; Mr. H. Bertens; Farren plaque, best members, Mr. D. Evans; Mr. D. Evans. The society's president for the last 19 years, Mr. J. O. Smith, has now retired with the society's thanks and best wishes for a happy retirement. Mr. Bernard Bromfield is the new president.

...FINAL League positions for 1971 among YORK & D. A.S. members are: Mr. A. S. Allison (133), Mr. R. Leadbetter (136), Mr. J. D. Leadbetter (137), Mr. R. Leadbetter (138), Mr. R. Leadbetter (139). Leading positions for the Albert Simone trophy are: Mr. J. Howard, Mr. J. Park, Mr. P. Carev, and Mr. P. Park. Junior League results are: R. Swallow (44), P. Hough (34), J. Kierlel (19).

...LEAMINGTON & D. A.S. winners of the society competitions in 1971 are: home aquarium, Mr. Bird; Member of the Year, Mr. P. Thomas; table show, Mr. J. J. Smith; breeders, Mr. C. Beard; junior member, J. & S. Bird; best in show, Mr. E. Bird; pond competition, Mr. C. Beard.

...FOR those particularly interested in native coldwater fish, the BRITISH ICHTHYOLOGICAL SOCIETY are still only £1.00. Mr. D. Marshore, secretary, will be very pleased to send any details of the society's activities (49 Stanhope Green, Welwyn Garden City, Herts.).

...BETHNAL GREEN A.S. held a most successful dinner and dance at the end of January. Mr. Frank Toms of the F.A.S. presented the club trophies for the year to: Wilkinson Memorial Bowl, Mrs. J. Hedges; First Year Members Cup, Mrs. J. Hedges; Points Cup: 1. Mr. P. Arnold; 2. Mr. J. Connolly; Fish of the year: 1. Mr. J. Connolly; 2. Mr. P. Arnold; 3. Mrs. J. Hedges; 4. Mr. D. Bundy; Fish of the month: 1. Mr. P. Arnold; 2. Mr. J. Connolly.

...EAST KILBRIDE A.C. much enjoyed the slide show on freshwater fishes presented to them by their president, Mr. E. W. Nielson. Mr. Grant also judged the table show of guypers and novelty class for a container furnished to an attractive or humorous design. Class winners were: guypers (male), Mr. A. Lyons; guypers (female), Mr. J. Finlay; juniors, G. Grasime, Novelties: Mr. J. Thomson; juniors, K. McKenzie.

...MEMBERS of PLYMOUTH A.S. at the Vivid Club, Richmond Walk, enjoyed talks given by Mr. B. Lucas on breeding emperors, tetras and Mr. J. Randle on breeding Saramee fighting fish. The best in the show award in the guypers class went to Mr. Reed. Novices: 1 and 2, Mrs. Hook; 3, Mr. Kendall; Novels: 1, 2 and 3, Mr. Chubb; Premier: 1, 2 and 3, Mr. Reed.

...CASTLEFORD & D. A.S. have started the New Year in a new accommodation at the Pontefract Carlow Community Centre because of difficulties in finding a venue in Castleford suitable for the junior members. Eight new members were among those who heard the talk by Mr. F. West on tropical fish.

...ATTENDANCE at the Hastings & St. Leonards A.S. auction night broke all club records when 90 people joined in the bidding. The table show for Corydoras was won by Mr. G. Funnel. A talk by Mr. D. Wilson, an experienced glassblower, on creating an aquarium was very well received by members who learnt some of the tricks of the trade. The table show for own breeding, livebearers, was won by Mrs. A. Adam. 

...CONGRATULATIONS to Mr. J. R. Regan of the SOUTH LONDON SECTION of the F.G.A. on attaining his silver badge. Evidence of the imposing standard of gupper breeding is also made apparent by the three silver awards gained in the table show at the A.G.M.
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22nd-24th June. BRISTOL TROPICAL FISH CLUB. Open Show. Congregational Church Hall, New Street (off St. Andrew's Road), Bristol. Schedules: Mr. R. Lamoreaux. 16 Copenhagen Park, Eastville, Bristol BS5 9RJ.

24th June. ANSON A.C. Open Show. Details to follow.


26th June. GOSPORT & D. A. S. Open Show. Crafton Community Association, Sholing, Hants. Details: Mr. P. Hayward, 226 Llanes Road, Park Gate, Southsea.

27th June. CASTLEFORD & D. A. S. Open Show. Castleford Community Centre, Castleford. Per: Mr. F. W. F. B. Lempriere. 35 Station Road, Park Gate, Southsea.


27th June. NORTH WARWICKSHIRE A.S. Open Show. The Settlement, Kingstanding Road, Kingstanding, Birmingham. Details: Mr. T. T. Shutf, 15 South Cambridge Road, Edgbaston, Birmingham.

27th June. LYTHAM A.S. Open Show. Lower Gardens Pavilion, Lytham, Lancs. Details: Mr. D. Wright, 15 Cambridge Road, Blackpool, Lancs.

28th June. BASINGSTOKE & D. A. S. Open Show. Commercial Hall, Basingstoke. Schedules from Mr. M. Strange, 100 London Court, Netley Close, Basingstoke, Hants.

28th-29th June. ROMFORD & BEACON- TERRA A.S. Open Show (Dagenham Town Show). Central Park, Dagenham, Essex.

Schedules (latter):

- Mr. W. F. F. B. Lempriere, 35 Station Road, Park Gate, Southsea.
- Mr. J. G. T. H. Rose, 15 South Cambridge Road, Edgbaston, Birmingham.


23rd July. PORTSMOUTH A.S. Open Show. Portsmouth Community Centre, Shoreham Avenue, Portsmouth. Fish entered 25th, judged 30th, public 7-12th. Schedules: Mr. J. Stubbins, 74 Salcombe Avenue, Copnor, Portsmouth.

3rd August. TONBRIDGE & D. A. S. Open Show. Details (latter).


7th August. NORTH STAFFS. A.S. Open Show. Details (latter).

8th August. BEDWORTH & P.S. Open Show. All Penguins, Coopersville School, Bulking Road, Bedworth. Schedules: Mr. T. S. Hewitt.

9th August. OLDHAM & D. A. S. Open Show. Oldham. Details: Mr. E. J. Birchwood, 80 Inverness Avenue, Blackburn, Manchester.

10th August. PLYMOUTH D. A. & P.S. Open Show. Plymouth Y.M.C.A. Details: Mr. J. Rumble, 50 Durham Avenue, Lipson, Plymouth, Devon.

13th August. BETHNAL GREEN A.S. Open Show. Details to follow.

24th September. YATE & D. A. S. Open Show. Yate, Glos. Schedules: Mr. M. Emery, 154 Sunbridge Park, Yate, Bristol (phone: Chipping Sodbury 311345).


10th September. HAVANT & D. A. S. Open Show. Havant Town Hall, Havant. Details: Mr. V. B. Hunt, 120 London Road, West End, Portsmouth, Hants.

16th September. HOUNSLOW & D. A. S. Open Show. Hounslow Youth Centre, Cecil Road, Hounslow.


24th September. NORTHAMPTON & D. A. S. Open Show. Details to follow.

24th September. OSRAM A.S. Open Show. Recreation Hall, Refuge Street, Oldham, Lancashire.

26th September. TORBAY A.S. Open Show. Torquay Town Hall. Details to follow.


27th October. BASS Meeting. Thursfolds, Lecture Hall, London Zoo, Regents Park, London W.I. 2.30 p.m. All welcome. Tickets from Mr. F. Keene, Highfields, Old Hill, Woking, Surrey.

14th-15th October. B.A.F., Belle Vue, Manchester.

2nd-3rd October. SHERWOOD A.S. Open Show. Details to follow. Show secretary: Mr. J. Ingham, 23 Marples Avenue, Mansfield, Woodhouse, Notts.

27th-28th October. THE AQUARIUM SHOW. 72, Royal Horticultural Society, Old Hall, Vincent Square, London SW1. All details from the Organiser, 334 Garratt Lane, London SW17 6NY (01-947 2683).


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<th>Plant Type</th>
<th>Price</th>
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<tr>
<td>Bunch Plants</td>
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<tr>
<td>Bacopa small</td>
<td>25p</td>
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<tr>
<td>Bacopa large</td>
<td>25p</td>
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<td>Cabomba Green</td>
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<tr>
<td>Cabomba Red</td>
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<td>Alternanthera</td>
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<td>Elodea densa</td>
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<td>Hygrophila</td>
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<td>Ludwigia</td>
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<td>Giant Hygrophila</td>
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<td>Giant Red Hygrophila</td>
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<td>Sagittaria natans</td>
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<tr>
<td>Giant Sagittaria</td>
<td>60p</td>
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<td>Twisted</td>
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<tr>
<td>Tortilolia</td>
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<td>Utricularia</td>
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<td>Water Gardening catalogue, Postage 5p</td>
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<td>Floating Plants</td>
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<tr>
<td>Water lettuce</td>
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<td>Salvinia</td>
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<tr>
<td>Amazon Frogbit</td>
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<td>Specimen Plants</td>
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<tr>
<td>Amazon Swords</td>
<td>22p</td>
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<tr>
<td>Ruffled Swords</td>
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<tr>
<td>Variegated Rush</td>
<td>22p</td>
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<td>Dwarf Plants</td>
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<tr>
<td>Radicans Swords</td>
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<td>Malayao Swords</td>
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<td>Borneo Fern</td>
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<td>Nipa Palms</td>
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<td>Blyxa japonica</td>
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<tr>
<td>Spatterdock large</td>
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<td>Umbrella Fern</td>
<td>12p</td>
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<tr>
<td>Nymphae Stellata</td>
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<tr>
<td>Complete plant collections from above</td>
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<tr>
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<td>5 Cryptocorynies all different</td>
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<td>wendtii</td>
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<td>beckettii</td>
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<td>affinis</td>
<td>12p</td>
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<tr>
<td>Hairgrass</td>
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<tr>
<td>Pygmy Swords</td>
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<tr>
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<tr>
<th>Plant Name</th>
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<tbody>
<tr>
<td>Aglaonema simplex</td>
<td>15p</td>
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<tr>
<td>Alternanthera sessilis</td>
<td>5p</td>
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<tr>
<td>Ambulia spp. (Limnophila spp.)</td>
<td>4p</td>
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<tr>
<td>Aponogeton crispus (x A. undulatus x A. natans etc.)</td>
<td>10p</td>
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<tr>
<td>A. natans</td>
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<tr>
<td>A. rigidoiolius</td>
<td>35p</td>
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<tr>
<td>A. urceus</td>
<td>27p</td>
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<tr>
<td>A. undulatus</td>
<td>10p</td>
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<tr>
<td>Azolla spp. (fairy moss)</td>
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<tr>
<td>Ceratopteris cornuta (floating fern)</td>
<td>7p</td>
</tr>
<tr>
<td>Chalcostigma (Indian fern, water sprite)</td>
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<tr>
<td>Cryptocoryne affinis</td>
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<tr>
<td>Balanaceae (syn. C. somphongsi)</td>
<td>15p</td>
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<tr>
<td>Beeckettii</td>
<td>27p</td>
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<tr>
<td>Blasia</td>
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<tr>
<td>Ciliata gigantea</td>
<td>15p</td>
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<tr>
<td>Ciliata minor</td>
<td>10p</td>
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<tr>
<td>Cordata</td>
<td>27p</td>
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<tr>
<td>Grifithii</td>
<td>15p</td>
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<tr>
<td>Haertellana (de Wit: C. affinis)</td>
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<td>Lucene</td>
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<td>Nevillii</td>
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<td>Pechii</td>
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<td>Thywaitii</td>
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<td>Walkeri</td>
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<td>Wendii</td>
<td>15p</td>
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<tr>
<td>Williisi (syn. C. undulata)</td>
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<tr>
<td>Echinodorus brevipedicellatus (small-leaved Amazon sword plant)</td>
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<tr>
<td>Cordifolius (syn. E. radicans) (Cellophane sword plant)</td>
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<tr>
<td>Grisbachii (syn E. intermedius)</td>
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<tr>
<td>Magdalenesis (syn. E. intermedius) (dwarf Amazon sword plant)</td>
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<tr>
<td>Martil (ruffled sword plant)</td>
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<td>Panciulatus (syn. E. intermedius) (narrow-leaved Amazon sword)</td>
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<td>Panciulatus var. Rangeri (Amazon sword plant)</td>
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<td>Tanillus (miniature chain sword)</td>
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<td>Eleocharis virgata</td>
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<tr>
<td>Elodea crispa (Lagosphinthus mucoides)</td>
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<tr>
<td>Densa (syn. Egeria densa)</td>
<td>4p</td>
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<tr>
<td>Hygrophila striata (Nomaphila striata) (plant Hygrophila)</td>
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<tr>
<td>Ludwigia natans (syn. L. mulleensis)</td>
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<tr>
<td>Palustris, in various forms (water purlane)</td>
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<tr>
<td>Microsorum pteropus (Java fern)</td>
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<tr>
<td>Najas spp.</td>
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<td>Nitella spp.</td>
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<tr>
<td>Nymphoides aquatica (underwater banana plant)</td>
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<td>Pistia stratiotes (water lettuce)</td>
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<tr>
<td>Rotala rotundifolia</td>
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<tr>
<td>Sagittaria eurynoa (syn. S. litoralis)</td>
<td>5p</td>
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<tr>
<td>S. pusilla (pygmy sag)</td>
<td>5p</td>
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<td>S. platygrya</td>
<td>5p</td>
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<tr>
<td>Salvinia auriculata</td>
<td>10p</td>
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<tr>
<td>Spathiphyllum</td>
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<tr>
<td>Synneuma triflorum (water wisperia)</td>
<td>10p</td>
</tr>
<tr>
<td>Vallisneria gigantea (giant valis)</td>
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