

JANUARY 1975

20p

Pet **Fish**

PRACTICAL FISHKEEPING MONTHLY



Contents include:

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Meriniat's Notebook
American Water Purslane
Pond Water-Exchange System

Colour in Guppies
North American Catfishes
Chocolate Gourami Spawning
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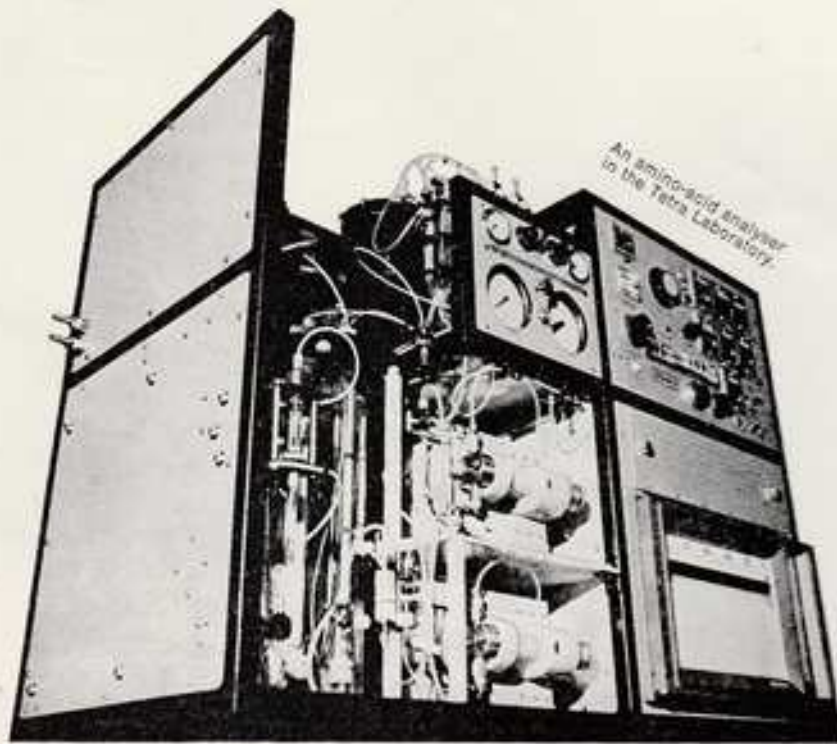
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PetFish Monthly 20p
Vol. 9 No. 9
January 1975

Subscription rates: £3.00
for 12 issues; £1.50 for 6
issues (U.S.A. and Canada
\$7.50 for 12 issues)

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Advertisements:

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P. F. Publications
554 Garratt Lane
London, SW17 0NY
Telephone 01-947 2805

Comments and Quotes

- Need for enlightenment
- How the tuna keeps warm
- Gold(Fare) Fish

An Aim for 1975

ON a television programme recently — a documentary on a subject nothing to do with fish — the cameras showing the inside of someone's living room included, quite by chance, a shot of a fish tank reposing on a side table — a small plastic tank without a cover. It was a horrible sight, even in black and white, and unimaginable in colour. It was not possible to see any fish in the tank because of the opacity of the water, a cloudiness soon explained when a small child was seen to be offered a box of dried food to 'feed the fish' as a diversion to stop its crying. This was a revealing glimpse of what, one suspects, may be the state of many such tanks bought 'for the children'.

A home aquarium is continually on view; the dirty rabbit or cavia cage is often at the bottom of the garden, the bird cage too high for visitors to see the mess on its floor and when the bird seed finally encroaches on the human environment it is, usually at least, swept up from the carpet. Even the dog's and cat's bed can be shoved out of sight in an emergency. Obviously the purchaser of the small tank and couple of fish doesn't expect it to turn into this kind of eyesore; unfortunately purchasers often don't know why it happens or what to do about it when it does, until, finally, unable to bear the unpleasant sight any longer, they give up 'keeping fish'. In

the meantime, friends and relations who've seen the offending object have all probably made a mental note never to keep fish themselves.

In this area hobbyists can do a great deal more not only to win the general public over to the pleasures of correct fish-keeping but to guide them as well. Let us not just tell them about keeping fish — but show them how! The many society open shows open to the public and exhibitions would seem the ideal places to mount a small demonstration on how to set up a fish tank so that it looks and stays an attractive sight. Some of our many talented society lecturers would know that the aim was not to 'blind with science' but to keep it simple — demonstrate how to put the plants in, how to wash gravel, how to siphon out a tank, how to clean the glass, how to fit up a heater and thermostat, and correct feeding techniques.

The spectator looking at exotic fish 'champions' may have a feeling of admiration but equally can have a conviction that such achievements are well beyond his own powers. A simple demonstration on how to set up a new tank could even result in more new club members than all the splendours of the specialist's skills.

Fish Central Heating

NEXT time the underwater camera reveals the marvels of the tropical deep on your home screen, watch out for the smirk on the face of the tuna fish.

Researchers D. Stevens, How Man Lam and J. Kendall of the University of Hawaii in Honolulu have been studying the curious phenomenon shown by tuna fish in having a body temperature noticeably warmer than the surrounding water. The heat produced by the muscles of other species when swimming is largely lost when taken by blood flowing through their muscles to the gills; there the cooling effect of the sea removes it. Tuna, on the other hand, may have a muscle temperature as much as 20°C above the surrounding water temperature (the large bluefin tuna) to 9°C warmer in the small skipjack tuna. The investigations have shown that the tuna has acquired a structure, in the process of evolution, the principles of which man has only recently proudly utilised himself and

called a counter-current heat-exchanger. The tuna's 'heat-exchanger', located just below the backbone, consists in thousands of small thin-walled, cunningly-arranged blood tubes through which heat coming from the muscles, before it can be lost at the gills, moves across to the cooler blood going back to them. Warm muscles work better than cold ones, so the tuna fish can remain more active than its local companions — which gives it a definite built-in advantage in the search for food. (From a report in NEW SCIENTIST.)

Gold (Fare) Fish

REGULAR readers will recall some of the railway and other

public transport sagas involving fares for fish we have quoted from time to time. A collector's item is this one, concerning a continental railway for a change, from THE TIMES:

"The Italian railways have demanded immediate payment from a young woman of 6,600 lire (£4), the estimated fare of two goldfish she carried from Rome to Cassino.

"The fish set off from Rome on June 22 carried in a jamjar by Signorina Carmela Tiseo, aged 30. The ticket collector insisted that they came in the category of beasts weighing up to 25 kilograms.

"Signorina Tiseo told him that the regulation was stupid, and today, given the demand for payment, commented: 'To think that even a Christian only pays 1,350 lire from Rome to Cassino!'



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

Fish Behaviour

I DON'T understand fish any better than I do human beings—in fact, I think they are just as stupid! I have two red-tailed black sharks in my tank, the smaller of which is continually harassed by the larger one—it cannot rest or eat without being 'attacked' by the other. So I obtained some Netlon to divide the tank. After erecting the divider, with great care and not a little trouble and difficulty, I separated the warring sharks.

I would have thought the smaller one would have been grateful for a bit of peace, whilst its tattered fins and battered scales recovered; I would have thought also that it (sex unknown) would have appreciated the opportunity to eat a few worms and fleas unmolested by the big bully for a change. Not a bit of it! The smaller one is apparently a masochist and cannot bear to forego the lambasting it was getting. It literally charges the barrier, and, despite all my ingenuity, it has several times got through, but blow me if I can see how or

where (and he hasn't gone over the top because the lid sits tight upon it).

At present I've got them separated again, but they're glaring at each other through the grill, and it's only a matter of time before the smaller one will fight its way back into the big chap's domain—and get another hiding. I give up!

Twickenham, Middlesex

D. ROBERTS

Open to All

DURING recent conversations, I have been told by two people that the British Killifish Association operates a 'closed shop'. I wonder if readers agree, for, as both an ordinary member before and as a Management Committee member now of the Association, I feel that the evidence points towards the reverse. I will agree that the newly found or imported

Continued on page 427

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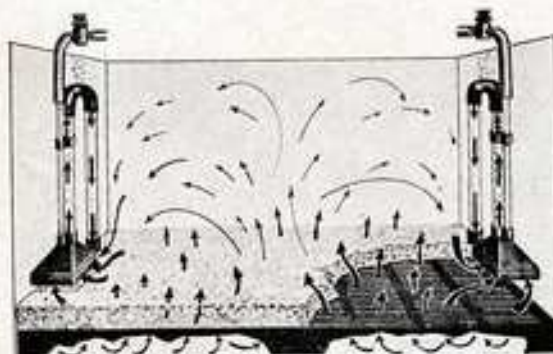
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LETTERS

continued from page 422

fish will tend to be available only with the Association. On the other hand, both the dealers and the breeders seem to supply the general aquarist with a wide range of killifish. In the not-too-distant past, when shows were held they often contained the class 'Danios, Minnows, Killifish and Rasboras'. It is now very common in this area, and also by reading the published results, to see that killifish have become a separate class. The numbers exhibited have steadily risen. Is it therefore true that the Association is a closed shop? If it is, then it must have a lot of 'back doors'!

Anyone who is a member can, without any qualms, sell or give his fish to an outsider. No doubt some members would never do this, but if they bred 1,000 pairs of a single type of fish they would never find a home for them all within the 500 or so members. This is an exaggeration, but does point to the reason for the 'back doors' as killifish can often be prolific just like other fish.

I hope that the remark 'closed shop' said in a derogatory manner will no longer be used in connection with the British Killifish Association. The fish within the Association that are not readily available outside will be those that are not prolific and

more difficult to breed than the easier types which are available generally to all aquarists.

BRIAN TATE (BKA3)

Bingley, West Yorkshire

The Aquarium Show '74

WHAT was the name of the striped catfish on the stand facing the entrance at The Aquarium Show? My fish are all quite small but I would certainly like to have him at home if I had the room. He seemed to be really interested in all the faces peering at him though he managed to keep pretty calm about it all.

P.S. I have all the Aquarium Show badges so far.

Bromley, Kent

JONATHAN CLARKE
(aged 12)

This catfish is Panaque nigrolineatus and is owned by Mrs May Nethersell of Riverside Aquarist Society. We certainly hope it will be at the Aquarium Show again, perhaps on the Catfish Society stand as it was this year.

I WAS once again disappointed at the number of entrants in the Supreme Championship Class at this year's Aquarium Show. What had happened to the other fish-winners of heats—have they all died? Why not keep all the trophies to be given out at the Finals? This would be a good test of fishkeeping and might produce more fish.

Crawley, Sussex

K. MOND

Meetings and Changes of Officers

BARRY AS. President, Mr D. Wainwright; vice-president, Mrs Currie; chairman, Mr A. Wallace; vice-chairman, Mr C. Webber; treasurer, Mrs E. Stear; secretary, Mr A. Smith (8 Salisbury Road, Barry, S. Wales); show secretary, Mr G. Parker; assistant, Mr M. Guthrie; technical adviser, Mr E. Nelson.

EMBS AQUATIC & STUDY SOCIETY. New Society. Secretary, Mrs P. J. Archdale (47 Abercrombie, Queen's, Chester-le-Street, Co. Durham, DH2 1JH); phone Striley 43071; chairman, Mr S. T. Lodge. Meetings: fortnightly Thursday, 7.30 p.m., Birelei Fish Reservoir, Durham Road, Birelei.

CATFISH ASSOCIATION GREAT BRITAIN. Change of officers. Secretary, Mr Alan Haley (255 Lewisham Way, London, SE4 1EF); P.R.O., Mr Steve Tinkley.

HENDON B. DAS. Chairman, Mr

H. G. J. White; vice-chairman, Mr K. L. Pirbrick; secretary, Miss V. Louquet (2 Marsh Drive, Hendon, London, NW9); assistant, Mrs H. C. Thompson; treasurer, Mr J. Packham; show secretary, Mr R. S. Thompson (17 Highfield Avenue, Kingsbury, London, NW9 9PD).

HOUSLOW B. DAS. Chairman, Mr R. Nichols; secretary, Mr H. Parrish (18 The Barons, St Margarets, Twickenham, Middlesex, TW1 2AP); treasurer, Mrs S. Parrish; show secretary, Mr A. Constantine; newsletter editor, Mr R. Searry; librarian, Mr T. Bellingbrook; P.R. officer, Mr H. Pratt; press secretary, Mrs S. Wintblade; show manager, Mr E. Sheppard. Meetings: St Stephens Church Hall, Houslow, Middlesex.

LINCOLN B. DAS. New secretary, Mrs R. Woodrife (Sandown, 28 Richmond Road, Lincoln, LN1 1LG).

NEWBURY B. DAS. Secretary, Mr Hulford (25 Mesnick Drive, Wash Common, Newbury, Berks.; phone Newbury 4697).

PETERBOROUGH FISHKEEPERS ASSOCIATION. Meetings: 1st Tuesday of month, 8.00 p.m., The Old Scarlet, Dogthorpe. Secretary, Mr C. Brakes (62 Wisbeck Road, Thorney, Peterborough). New members are always welcome.

READING B. DAS. Chairman, Mr A. S. Goslin; secretary, Mr S. R. Broome (40 Calbeck Drive, Woodley, Berks.; phone Reading 694280).

SWILLINGTON AS. President, Mr J. Parkin; vice-president, Mr G. Sinks; secretary, Mr M. Walker (15 Deanswood Rise, Leeds, 17, Yorks.); treasurer, Mr B. Hambury; show secretary, Mr & Mrs R. Hishop (1 Filtree Gardens, Leeds, 17, Yorks.); social secretary, Mr D. Stoad.

YEDVIL B. DAS. Secretary, Mr F. C. New (18 Mansfield Road, Yedvil, Somerset; phone Yeovil 24225). Meetings: 1st Wednesday of month, 7.30 p.m., The Moose Centre, St Michael's Avenue, Yeovil. New members very welcome.

Family AMEIURIDAE

North American Catfishes

By J. C. THIÉFAINE

Illustrated by
the author



AMONG the many catfish families that are known to present-day hobbyists few enjoy great popularity in aquarium-keeping. The most popular are without any doubt the little *Corydoras* from Southern America. Bigger fishes are not welcome in most aquaria, because of their digging habits and great voracity. However, some other catfish species really deserve more regard from aquarists than they usually enjoy, because they often show a very peculiar behaviour pattern and since they are very hardy and take well to aquarium life; they are also as convenient for the beginner as for the more advanced hobbyist.

One of the catfish families whose members are easy to keep comprises the ameiurids, synonym ictalurids (Family Ameiuridae), from North America, one species of which was introduced into European freshwaters in 1885 where it has thrived to such an extent that the fish have become a real plague in some regions,

Characteristic of the North American catfish best known to aquarists, *Ameiurus nebulosus* (*Ictalurus nebulosus*), are the eight barbels around the mouth: four arise from the upper jaw and four fringe the lower jaw. The two lateral barbels of the upper jaw are very long

their voracity causing great damage to the native fish population. This species is *Ameiurus nebulosus* (syn. *Ictalurus nebulosus*), the brown bullhead, better known in the British Isles as the American catfish.

Its original area in the United States was between the Rocky Mountains and the Atlantic Coast, but now the fish is very common in many standing and slowly flowing waters of Europe.

The first apparent characteristic of *Ameiurus nebulosus* is the broad and dorso-ventrally flattened head, which includes about 23% of the whole body length. This feature is still more apparent in

young fish, giving them the aspect of tadpoles. This impression is reinforced when seeing them swim, for they move in much the same way as frog larvae. Older individuals are plumper and this particular form somewhat disappears. As in all members of the family Ameiuridae (syn. Ictaluridae) the body is naked, without scales or the bony plates seen in many other catfishes. It is cylindrical and laterally compressed towards the rear. The skin is very slimy. *Ameiurus nebulosus* grows very big for our normal aquarium sizes, up to 18 in., but specimens of 10-12 in. are more often caught. Fish who spend their whole life in the aquarium are unlikely to exceed 10 in. in length.

A remarkable characteristic of the species are the eight barbels around the mouth, four of which are situated on the upper jaw and four on the lower jaw. The uppermost two barbels stand close behind the nostrils and they are as long as the four of the lower jaw. The lower two barbels of the upper jaw are located at the mouth corners and they are the longest. They can reach the base of the pectoral fins. The two pairs of barbels on the lower jaw are of the same length as each other and disposed as a comb. All the barbels contain many taste buds, which help the fish find its food. The mouth is terminal and has a wide opening which allows the fish to swallow fairly large prey. The jaws are furnished with numerous small teeth.

The finnage of the American catfish also presents some distinctive features. The fish possesses a second dorsal without rays, the so-called 'adipose fin', as present in many characins and salmonfishes. The anal is quite well developed and much longer than this fin in our common European freshwater fishes such as carp, tench, rudd etc. The first dorsal consists of a strong spiny ray and six to seven soft rays. The first ray of the pectorals is a hard spiny ray, too, by means of which the fish can seriously wound the inattentive or ignorant angler or aquarist who holds it with bare hands. The wounds easily become infected and they may take a little time to heal. When you have to remove such a fish from a tank, a hand-net should always be used.

The colour of *Ameiurus nebulosus* varies from greyish-brown to black with a greenish shimmer on the sides. Sometimes a more or less apparent marbled pattern

can be seen. Additionally there is also a marbled species, as we shall see later in this article, but it has not yet been imported to Europe. The belly varies from dirty white to yellowish. The iris of the eye is golden. The general colour can vary according to the place where the fish lives.

Catfish are mainly bottom-living fish. This characteristic does not, however, prevent them from swimming close to the water surface. Further, although they are principally nocturnal animals which remain hidden in holes or under roots during the day, my fish were caught at noon in April, in warm sunshine, just under the surface where they were swimming. I may assume that they were attracted rather by the warmth than by the sunlight. A similar occurrence could be observed many times in the aquarium, where the fish rejected hiding places and swam to the surface where they could warm themselves between floating plants, under the lamp.

The American catfish takes very rapidly to life in the aquarium. Individuals who had just been introduced to the tank at first seemed not to taste any surface food (dry food which is not yet soaked and has not yet fallen to the bottom). They were busy with the inspection of their new home and combed the bottom actively, with the help of their barbels, for food. A colony of tubifex worms which were living in the tank disappeared after a short time. A few days later, the fish were accustomed to all kinds of food. Dried brand foods, even dried water fleas, were eaten greedily, but pieces of earthworms are dainty bits for them. After about 10 days in captivity the fish had become so familiar and tame that they were not at all afraid to take small bits of earthworms from my fingers. They were only 1½ to 2 in. long at that time, and I must say that I would not dare do this again with bigger fish of 5 in. and above, for fear of their teeth, as they can open their mouth widely and vigorously bite their prey. Nevertheless, big catfish are reported to be just as tame as younger ones.

The feeding of catfish raises no problem if we consider them to be omnivorous. In the tanks of an acquaintance of mine I have seen a fish which even eats the soft French cheese Camembert, and canned food for cats and dogs. Nevertheless, I will tell you about a strange happening in my

tanks, concerning the feeding of these fish. For a long time I had been feeding my *Ameiurus* with worms and various artificial foods. As I was expecting some common sunfishes (*Lepomis gibbosus*), from a friend living in south-western France where the genus is widespread, I thought it would be advisable to start breeding some guppies as live food for them and which the catfish would enjoy, too. This is what I thought, but the matter developed quite otherwise.

The catfish tank is 40 in. long, 12 in. wide and 16 in. high. The following occurred in summer, at a water temperature of 60-64°F (16-18°C). I introduced some young guppies into the catfish aquarium with the thought that the catfish would quickly get rid of them. But this did not happen and the livebearers remained alive. Some of the explanations that may be given for this are the following.

1. Catfish are actually bottom fish which seldom search for food along the surface. In the small tank (20 in. by 8 in. by 11 in.) where I had originally kept them they regularly came to the surface and took dry food from there. The depth of water was only about 11 in. in this tank. In the 40 in. aquarium, I was unable to observe this behaviour. The fish remained on the bottom waiting until the food was soaked and had fallen down to the base. As young livebearer fry habitually frequent the upper part of the water and swim in the proximity of the surface, this meant that catfish and guppies never met each other and so the latter survived.

2. The temperature was rather low for young livebearers and they never tried to swim to the lower parts of the aquarium, where the water was colder. They remained in the upper part that received light, and warmth, from the lamp, and where they could find hiding places among floating plants.

I had also been able to observe the scorning of young fry as food when I had put some runt goldfish into the catfish tank in the winter time. These also remained close under the surface, although they had no plant there to hide themselves in because the tank was planted with coldwater weeds which partly die in winter. Also in this case the predators took no notice at all of the prey, though it was perfectly possible that a 4 in. long catfish could swallow a

half-inch young goldfish.

The guppies soon became very numerous and they quite rapidly took possession of several aquaria, since the promised sunfish never reached me. I began with one male and three females and six months later I had more than 200 guppies swimming in five small tanks each 16 in. by 8 in. by 9½ in. At length I discovered the ideal solution to this problem. Why should I not put a catfish into a guppy tank, as the catfish can stand higher temperatures without damage? I therefore selected a slowly growing individual of 2½ in. in length, which had grown from 1½ in. to 2½ in. 18 months, i.e. only 1 in. I introduced it into the guppy tank and left it without any more surveillance. After a couple of days I noticed that the number of guppies had obviously decreased. I had at last won the battle and I could get rid of my guppy plague. What also will interest the reader is that after a fortnight the catfish reached 3 in. in length and after 1 month was 3½ in. long. Regarding the nutrition problem I came thus to the conclusion that water depth plays a role. In the guppy tank, where the depth was only 9½ in., predator and prey met each other and the latter were eaten up by the former. This experience also shows how the way of feeding can influence the growth rate.

Another peculiarity of the *ameiurids* is that they are very short-sighted, as are most catfishes. However, their imperfect sight is compensated for by very well-developed hearing, which has occasioned many scientific tests in this field. When you move your hand quickly but noiselessly in front of an aquarium with goldfish, roach, carp etc., the fish react to your movement because they can see quite well. Often they even come to the front pane when they see their owner in the room, even at a distance of several yards. This does not occur with catfish and if you move your hand or an object rapidly but noiselessly along the window of their tank you won't notice any reaction. On the other hand, you will observe that they can perceive very slight noises which you hardly can hear. Periodicals and books mention that *Ameiurus nebulosus* responds to bell and whistle sounds.

In the house of a German scientist two of the fish even respond to the names of Adam and Eve. I suppose that this scientist originally kept the animals separately in

two tanks, or even in two different rooms. At the beginning he speaks the name of the fish and gives some food every time he comes near the tank. The fish thus associates the hearing of the name, Adam or Eve, with the notion of feeding. As fish have good memories, they will not forget their respective names. Placed again in a community tank they still respond to their owner calling them even if he does not give them any food. I have personally made the following test with whistle and bell sounds: whistling meant ground food such as worms etc., and ringing the bell was used to signal floating food at the surface.

After a few days the fish were fully trained, and as soon as they heard the whistle they came out of their holes and made for the place where food was to be given. (At the beginning food was given first so that they could smell it, and then the whistle was sounded, but later the whistle was first to let the fish come and then food was given.)

The same training was given with ringing the bell, so that as soon as the fish heard it they swam up to the surface where they expected food to be. Also in this case I gave food just before ringing the bell to start with, but later I gave the signal first and then the food. When the fish are well 'conditioned' you will see that they will come every time you give the signal even if you do not feed them at all.

Behaviour of the American catfish in the aquarium can vary quite a lot. The fish mostly remains hidden in a hole or under roots (remember this when setting up the tank). When it swims slowly, now and then it looks like an ungainly prehistoric creature (catfish are actually a very ancient group of fish and I think that 'prehistoric' is the right word), but when it has detected the presence of a worm or other prey on the ground, its movements become lightning-like and accurate. I have observed this rapidly and 'sharp-shooting' several times in the tank where a catfish was living with guppies. The predator is swimming slowly and tortuously along like a snake; a guppy approaches. Suddenly the catfish directs itself towards the prey and this is instantly swallowed — without sympathy we might say 'like a letter into the pillar-box!'. This may happen likewise when the guppy swims alongside or behind the predator. It is detected by the many taste buds

on the barbels and others which are located on the body of the ameiurid. Hunting by the catfish for fish can be better observed at night, when the aquarium light is out. Before I switch off the light of the tank I put on a feeble lamp in the room that still enables me to see the fish in their aquarium. As soon as the aquarium light is switched off, the *Ameiurus* comes out of its den and begins to hunt actively and it is not 2 minutes before it has caught a young guppy.

The resting positions of the American catfish are identical with those of the many tropicals belonging to the sub-order Siluroidea, some representatives of which (genus *Corydoras*) are very popular aquarium pets. The fish can as well lie on the bottom (which must consist of small gravel because the animal is sometimes prone to dig itself into the bottom medium, though not totally as do many tropical genera) or stand vertically, head upwards, between two plant leaves. It also can remain suspended in equilibrium with its hind part resting on a leaf or stone and its fore part floating freely in the water.

Fish accustomed to life in the aquarium soon forget their nocturnal habits and come out of their retreats in the daytime as well, especially when they hear their owner in the vicinity. They identify their owner by his steps and can distinguish him from other people.

For the tank furnishings, we must consider that *Ameiurus nebulosus* likes to remain hidden amongst rocks and roots and that it will avoid brightly lighted places. So we should set up its aquarium with holes and caverns built with flat stones or pieces of slate; pottery is also convenient for this purpose. The fish will appreciate such retreats very much. Success with a rich plantation of water plants will be possible only when the fish are not too large (or by the use of huge aquaria). The catfish can be so boisterous at feeding times that they can uproot plants and damage them. If nevertheless you want to have a rich plantation in your catfish tank, choose a large aquarium in which the fish will have enough space, which you may light intensively; in this event the ameiurids' need of shadow will be satisfied by the hiding places and some floating plants. As the fish are quite lively at feeding times and will also actively and extensively root in the gravel, particles

and mulm are whirled up and can suffocate delicate plants such as *Myriophyllum*. For the plantation you had better choose hardy plants of the genera *Sagittaria* and *Vallisneria*. Some *Nymphaea* can be of good service in large tanks. Considering the activities of the fish, a good filter (choose a powerful one) is advisable. When keeping very young catfish a filter is not necessary if the tank is spacious enough.

Before concluding this article I will introduce some other ameiurids, which are not found in our regions and which although not available in the pet shops should be as interesting in behaviour as is our catfish.

Ameiurus nebulosus marmoratus (Holbrook 1855) is widespread from Indiana to Florida and also can reach a length of 18 in. Its fundamental colour is olive-green, brownish green on the back and yellowish to dirty white on the belly. Numerous irregular brown, greenish or white spots adorn the head, back and flanks and contrast beautifully with the base colour. The fins are greenish and partly adorned with dark spots.

Ameiurus natalis (Le Sueur 1819) is spread in the region of the American Great Lakes and in the water system of the Mississippi. It can reach a length of 14 in. Its shape varies from that of our *Ameiurus nebulosus* and the formula of its fins is D I/7, P I/8, V 8, A I/24-27. In *Ameiurus nebulosus* and *Ameiurus nebulosus marmoratus* the fins are: D I/6-7, P I/7-9, V I/6-8, A I/20-22. Maybe *Ameiurus nebulosus marmoratus* could be considered as a sub-species of *Ameiurus nebulosus*, just as the goldfish could be considered as a sub-species of the silver crucian carp. The colour pattern of *Ameiurus natalis* can vary quite a lot: clay-yellow to greyish-green, mostly with some indistinctly appearing dark spots principally located on the back. The belly is lighter.

The genus *Ictalurus* (please note that recently all the catfish mentioned in this article received the name *Ictalurus*; as I am no systematist I still use both genera names, *Ameiurus* and *Ictalurus*, as they were still officially used not so long ago) also belongs to the family Ameiuridae and includes a fairly large fish which is considered as a food fish in its original area: *Ictalurus punctatus* (Rafinesque 1818), which is widespread in the large rivers of the southern and south-western U.S.A. It

can reach a length up to 28 in. Its finnage formula is: D 1/6, P 1/9, V 8, A I/25-30. The mouth is not as large as in other ameiurids. The lower jaw is as long as the upper. The colour varies from light-brown to greyish-green. The back is darker. The belly varies from yellowish to pure white with a silvery shimmer. Dark spots are spread over the whole body. The colourless fins are sometimes darkly edged.

To conclude, here is some advice on keeping ameiurids in the aquarium. They do not like painfully clean aquaria. They are capable of intestinal breathing, which permits them to live in dirty waters very poor in oxygen where other fish would die, so that aerating the tank can take place but is not a necessity. Packed in humid moss, *Ameiurus nebulosus* can be transported for several hours and on arrival will still be alive. A good mulm layer in the aquarium, in which they can actively search for food, is quite convenient to them. Heating is not necessary, and they swim as well at 50°F as at 75°F. Don't worry about pH and dH. These are words of a foreign language which ameiurids and their keeper cannot understand!

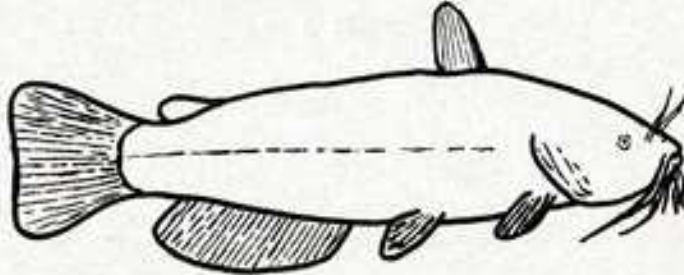
The most important point for keeping this kind of fish is feeding. Give them solid food and never forget that they need a lot of food. When young, North American catfish can be kept in the community tank, but never with smaller fishes, which they may consider as prey. They are quite peaceful with larger fish or fish of their own size. If you keep them in a community tank, feed them at night when all is dark and the other inmates of the tank have gone to sleep. The best is to feed them just before you go to bed. However, these fish feel better in a special and proper aquarium and you will have much more pleasure with them in such a special tank.

About reproduction, we know that the males take care of the youngsters and that the eggs are laid down in a kind of nest made of plants. The breeding should not be very difficult in very large tanks of at least 50 gallons. Although *Ameiurus nebulosus* is 'only a coldwater fish', without the beautiful colours of our tropicals, surely its interesting behaviour and quite undemanding habits can make it the aquarium fish. A hardy and enduring fellow whom every true aquarist should keep at least once in his life.

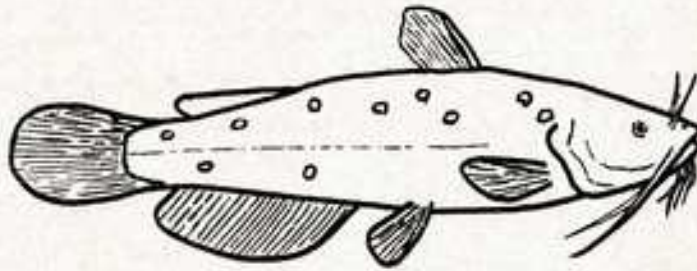
*Ameiurus
nebulosus
marmoratus*



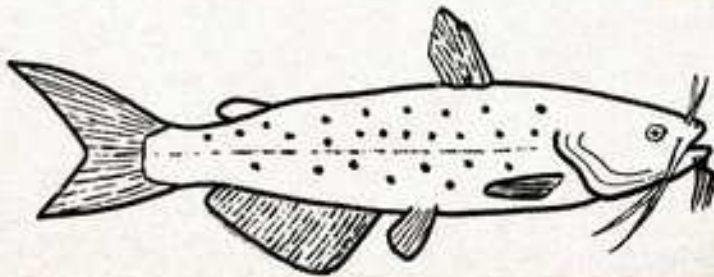
*Ameiurus
nebulosus*



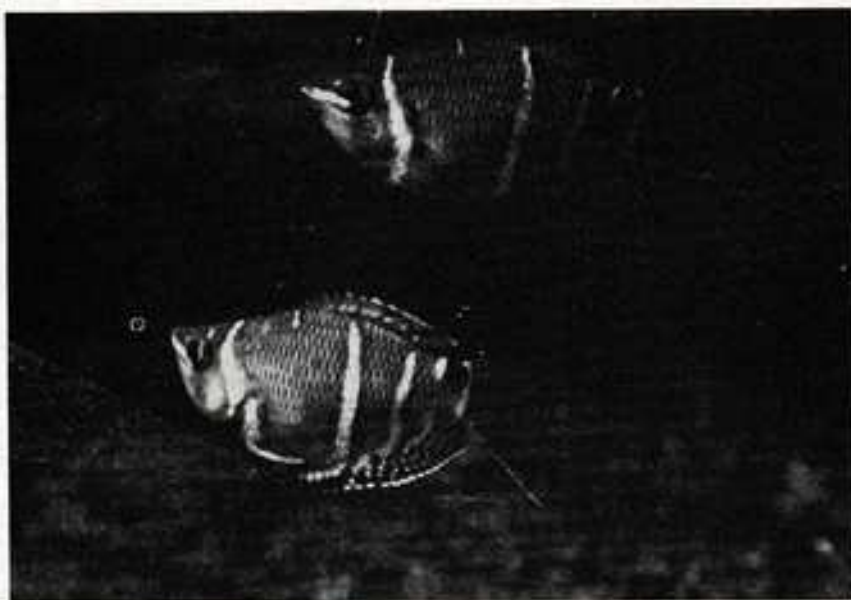
*Ameiurus
natale*



*Ictalurus
punctatus*



A Mouthful of Chocolates



Pair of chocolate gouramis spawned by the author. The female (lower fish) is carrying eggs in her mouth

TUCKED away in the corner of a cupboard in our fish room sits a little glass jar. It contains formaldehyde solution. It also contains twelve fish eggs. Closer inspection reveals the emerged form of the tiny fry, their heads and eyes clearly visible. These are the fry of *Sphaerichthys ophromenoides*, the chocolate gourami, and but for an unfortunate error would probably be enjoying a better position than the one they presently occupy. But let's go back to the beginning. . . .

Three months ago an order was placed with a local aquarists for a consignment of 50 chocolate gouramis. To minimise shock and the risk of infection, it was agreed that the fish would not enter the dealer's tanks but would be collected as they arrived from the wholesaler. Eventually notification of arrival was received, and the fish were collected immediately. They were small to medium in size and as usual looked very drab, displaying their

By P. M. GODFREY

Photographs by the author

'fright coloration', with perhaps two or three fish obviously on their last legs. A 25 gallon tank had been prepared containing soft, fairly acid water and into this they were placed. As this was a quarantine tank it was devoid of decoration except for some water lettuce, and most of the light had been excluded, to encourage the fish to settle more quickly into their new surroundings.

From past experience with chocolate gouramis it seemed a wise precaution to administer some form of medication at this stage, but as the usual antibiotics had proved unsatisfactory in the past our problem now was what type of medication we

should use. A prevalence of cestode worms revealed by post-mortem examination in previous batches of chocolate gouramis led us ultimately to the conclusion that Sterazin (a product marketed by SeAquariums Ltd.) might well prove effective and some was therefore purchased. The printed instructions were followed to the letter, the appropriate dosage was added to the aquarium water, and repeated on the third and sixth days. And it seemed to work. Incredibly, for the first time, all the fish survived and flourished (save the three ailing fish mentioned earlier), and anyone who has experience with newly imported chocolate gouramis will readily understand our delight with this situation.

After a week in quarantine the fish were transferred to their permanent home. This was a large glass-fibre tank having under-gravel filtration beneath a bed of inert gravel. Approximately 60 gallons of water were used, having a hardness of about 2½°DH and pH 6.3. Temperature was around 84°F (29°C). Cork bark was used fairly extensively in the decor along with some floating plants. This set-up had been running for about 2 months without occupants and was presumably mature. The fish were soon exploring their new environment with interest, and quickly settled in. Fed four or five times daily on live and dried food, they grew quickly. It wasn't very long before a number of fish were observed circling in a courtship-like manner, which led us to hope that spawning might occur before very long. In fact, the first spawning happened within 2 weeks of their being placed in their new home, and thereafter spawnings continued at the rate of about one per week, and always during the evening hours. A pair of fish may continue circling for several days before the eggs are released, but when this eventually happens the entire batch are expelled simultaneously. After the eggs are dropped, the fish remain motionless for 20 to 30 seconds, after which the female commences quickly to pick them all up, one at a time, into her mouth. Her throat now greatly distended, she swims away from the spawning site.

On the third morning (always the third morning) the female's throat is suddenly back to normal and the eggs are gone. Except, that is, the female whose eggs were mentioned at the beginning of this story. Although her throat was less dis-



Eggs of the chocolate gouramis after retrieval from the mouth of the female that died

tended on the third morning than it had been the night before, it was apparent that she still carried some eggs in her buccal pouch. So we watched her with special interest from then on to see how the situation would develop. By the seventh day we were getting worried. It was obvious she still carried the developing eggs, and our concern now was for the fry if and when they were released by the mother into the community tank. It would be difficult to ensure that their feeding was adequate, and the very real risk of their being eaten by the other fish had to be considered. In view of this, it was decided that the female had to be removed to a smaller tank.

This tank was accordingly set up, with water from her own tank and provided with places for her to shelter. When everything was ready the transfer took place, the fish being carefully netted into a small plastic container, and from thence into her new home. Unfortunately, whilst in the container she spat out the eggs, so the container was lowered into the tank with her, in the hope that she might pick them up again. This she did after about 10 minutes and we breathed a big sigh of relief, believing that the hardest part was now over. A watch was kept on her for an hour, and as she seemed to have settled down, we decided to get some fresh air and ease the tension which had built up.

Returning home about 1 hour later, we were absolutely astounded to find her lying dead on the floor! In our anxiety not to distress her more than was necessary, we

had left the cover glass off so that the plastic container could be retrieved at a later time after she had familiarised herself with the new surroundings. And, anyway, we had never ever seen a chocolate gourami jump! The water level was 3 inches from the top of the tank and the surface covered with water lettuce, so the risk didn't seem too great. But it was the biggest mistake we ever made! So she lay on the floor and gasped her last . . . except

this time she didn't spit out her eggs. Eventually, when it became apparent that she couldn't be revived, we reluctantly retrieved the eggs, but they too, by now, had perished.

And that brings us back to where we began . . . but given time, and the good Lord willing, we'll get the opportunity to complete part two of 'A mouthful of chocolate'.

Powerful Air Pump for Fish House Use

By CLIFF HARRISON



The Gast air pump

EXHIBITORS of fish at the Aquarium Show '74 were no doubt reassured by the aeration provided for the larger specimens (and any others in need of it): since the fish were of necessity kept in quarters rather more confined than they are normally used to, aeration does much to help keep them in top condition for the duration of the Show. The source of the air supplying the many dozens of diffuser blocks was a pair of Gast model 1531 rotary-vane compressors, kindly loaned by C. J. Skilton, Aquarist, the agent for the manufacturer. The performance of these units, impressive enough in view of the distances over which the air was transported through ordinary plastic air-line, was even more remarkable if one considers their diminutive proportions—roughly 8 in. by 4 in. by 5 in. overall. The advantage of such compressors over the much cheaper air pumps was neatly summarised by one of the show stewards who remarked that so much air was being produced that the fish could 'almost be blown out of the tanks'.

Although you need to have a lot of aquaria to make the Gast a practical proposition — it costs £72, once purchased, its 1/12 h.p. motor is relatively economical to run. One advantage of rotary-vane-type

compressors is that their output is not seriously affected by a build-up of back pressure: the model on display at the Aquarium Show was specially fitted with a pressure gauge to demonstrate this fact, and much interest was shown by the visitors.

A further important advantage is that the principal wearing parts — the carbon vanes and end plates — can be quickly renewed without special tools, ensuring that the time out of service is kept to a minimum.

An annual exchange service operated by the distributors is a specially attractive feature for the busy professional user of the Gast pump, since a brand new pump is supplied yearly under this scheme.

The Gast model 1531 produces approximately 1.6 cubic feet of air per minute (2,700 litres per hour) running free, and 1.25 cubic feet at a pressure of 4 pounds per square inch. The compressor is fitted with clear-glass filter chambers on both the inlet and outlet.

Details of the exchange service and leaflets can be obtained from C. J. Skilton, Aquarist, Great Gibcracks Chase, Butt's Green, Sandon, Chelmsford CM2 7TR, Essex.



by
ARPEE

Personal COMMENT

TO be hoist by one's own petard is a shameful and lowering thing. Those readers who have noted that I have often referred to the use of a small floating quarantine tank will, no doubt, have muttered in the background (for none has come out openly against the practice!) that I would sooner or later by this means introduce a sizeable helping of some dread disease or another into my collection. To be sure, there is a big element of risk-taking in this habit, but I believe I have always made it clear that it is only better than nothing: it is far from ideal, and I suppose that where lives are at stake nothing less than this should be our target. Life being what it is we all tend to compromise, and I admit the floating tank as being one of my bad habits.

I have used it for some years past without trouble, though its actual administration is awkward, and I am always glad to see it out of the way after successive additions have negotiated their respective trial periods. One of the most serious limitations of this arrangement is the quantity of fish it will support, and of course the size of the specimens under treatment must also be taken into account. I recently bought a quartet of flame tetras, of which there seem to have been some importations of quality, and these were consigned to the floating tank, as usual. All went well for about a week and they looked extremely fit. Then one of them looked somewhat depressed, with a lowered dorsal fin, and I wrongly diagnosed this as attributable to deteriorating conditions in the quarantine tank and decided to release the fish. Twelve days later white spot broke out in the collection these fish had joined — my first outbreak for several years. It may be noted that the disease did not appear on the flames until after it had emerged on some glowlight tetras and a rather elderly red phantom.

It may be just an impression, but no one seems to get worked up about white spot these days: some years ago the correspondence columns were full of tales of woe. I gloomily surveyed my medical box and, as is usual in cases of need, there was little which gave me any real confidence that I should have the matter under control as soon as I would have liked. Of course, it was a Sunday morning and few suppliers are open, so it was a case of using possibly outworn chemicals or waiting for Monday. I rapidly passed over two cures which required that the fish should be treated in separate containers. (I cannot imagine why people buy cures like this these days — surely folk are only interested in in-tank cures which do not degrade plant life?)

I therefore settled on the only alternative. It was a bottle labelled Magi-Cure, and it claimed that spot will go within 48 hours. At the time of writing, namely 3 days later, the disease is still evident, though the fish are not looking too bad. My dealer tells me that nothing is better, so far as he is concerned, than KB Formula WS3, which appears to contain malachite green. This is claimed to cure most cases within 24 hours. I hope to report on what actually happened when the round of treatment has finished, and if all that we read is true this should not take long. I have done just what the instructions said and I have not mixed the two treatments (my dealer specifically warned me against this).

I am reasonably confident that modern science will ultimately enable me to cure the white spot, but I am less than happy with the firms responsible for marketing the two products I have mentioned. The Magi-Cure bottle (it is plastic) bears a well affixed label on which appear instructions for use. It does not say whether it is poisonous and it does not bear the name of the manufacturer or marketer. If by chance this was taken in error there would be no means at all of establishing whether or not treatment was required, or what antidote might be applied by a hospital. The KB product did contain the name of the marketer, but the label was so printed that once again no clue was given as to the nature of the contents of the bottle.

It really is time that some legislation

was introduced to define the minimum requirements. I should make it clear that I do not particularly blame the marketers of the above products, but it would be refreshing if someone took the lead without the need for coercion. I have made mention of this subject earlier this year, and I hope that those who feel that enough is not being done will, like me, make their feelings known in the right direction.

If, after all this, the spot does disappear in double quick time, I shall feel something of a heel. But not very much of a one.



Buying fish isn't just going into a shop with some money and coming out with a plastic bag containing your purchases. It might work out this way in the middle of summer, but at this time of year unless you have adequate protection against a drop of temperature, particularly a sudden one, you are inviting trouble. A stout box, about 8 in. by 6 in. by 6 in., lined throughout with expanded polystyrene, is an essential for the assiduous purchaser and it gets you into good odour with your dealer, too, who otherwise has to pack your bag into something warm if a cold winter journey is ahead of it. (The more considerate dealers do this in summer, too.)

Regrettably, but few dealers are benefactors and this means that most of us are going to be sold rubbish at times: dying fish; dried out plants; rotting tubifex. There is a strange streak of meanness about some of those who sell living things, so that they simply cannot bring themselves to sell you twelve large neons even if there are fifty there in the stock tank. Somehow you arrive home with seven large ones, two medium ones and three with twisted backs and thin bodies. Be advised, therefore, to examine your purchases before you leave the shop and absolutely refuse to pay for specimens you don't approve of. Obviously, you will get a stony look if you are pernickety about the precise size of a trio taken from a tankful of superb fish of uniform dimensions, but otherwise exercise your discretion since most dealers lose interest in your purchase as soon as the door has closed. In the case of marines the responsibility appears to have passed as soon as the bag gets into your hands! I apologise to the

many dealers I know who consistently act most decently in this respect if my advice appears to condemn all: manifestly this is not so, since those whose standards are high will no doubt join me in pointing to practices which demean the trade.

As to consulting dealers about purchases, there again I have reservations. There are some dealers who know what is in your collection almost as well as you do, and these may be counted as your true friends, being rare enough. On the whole the dealer will give you the advice he thinks you want to receive and if you are stupid enough to want a piranha he will be most unlikely to talk you out of it if he has some specimens on sale. By all means consult your dealer about facts — ultimate size of fish, whether he can find you a pair etc., but if you have done your homework as you should have done, there should be little for debate. The dealer, being human, must get irritated by the indecisive fusspot who tries to corner him on a busy Saturday morning for a free half hour lecture on aquarium keeping, so it is perhaps small wonder that it is such as he who gets that guppy with the mangled fins.

I strongly advise purchasers, therefore, to read up their fish before purchase, in one of the standard works. If you haven't done this you have no business, really, buying fish at all. We have, after all, put impulse buying right behind us.



It is not easy to suggest quite how the coldwater hobby can be stimulated, but if the news got around that it was becoming fashionable to keep native fishes (and I have heard rumours to this effect), we might move a little more quickly in the right direction. This tendency is going to be accentuated as our natural resources continue to be eroded at the present rate, and it is alarming to consider that the day may not be long removed when the rudd is rarer than the discus! I know which of the two I would much rather preserve. One thing is certain, and that is that despite our doctrinal differences we must continue to air the cause of the coldwater and native fishes, because whatever the situation in the country might be this branch of the hobby has had a thin time of it as measured by newsprint. We must somehow repay our debt to our origins.

It is always a pleasure to hear from advertisers in PFM, but I was particularly pleased to receive a copy of the CATALOGUE OF THE EVERGLADES AQUATIC NURSERIES from my old friend Barry James, who is now director of the Everglades Aquatic Nurseries at Baunton, near Cirencester. The growing emphasis on the art of cultivation of plants in aquaria will have posed the question for many readers as to what is available and what sort of prices they will have to pay for something out of the ordinary, and this Catalogue (price 25p) goes a long way to meet the demand.

Its 32 pages are shared by descriptive notes on each species, many of which are supported by skillfully executed black and white sketches of the more prominent and popular plants usually available. It is the only catalogue in this price range which combines basic written information with such clear drawings which really do accent the more recognisable features of the species actually included, and many beginners will find it useful on this count alone. A number of rarities are also listed, but are not, of course, always available, I particularly like the frankness with which some species are treated, and though I would not agree with every bit of detail, the buyer is made well aware of those likely to defeat him, and this is refreshing

in times of high pressure salesmanship. An interesting selection of cultural notes is also included, and those who have not used the technique will discover food for thought in the comments on peat plates, so popular on the Continent as a substratum to our more conventional gravel bottom in aquaria. There are some sketches showing suggested plantings, but their value is more that of showing the relationship of some species to others, and they would have had more impact if reproduced to a larger scale.

A distinct drawback of this otherwise most useful publication is the spelling, which is at fault throughout. There are those who think this doesn't matter in this enlightened age, but the French would point to 'poisson' and 'poison' and disagree, as I do. I hope this catalogue will be revised before it is reprinted with this in mind. The reader will, however, forgive most if not all for 'Australian' on page 18, which is something of a collector's piece.

I found it irritating, too, that the descriptive index was not in alphabetical order, and closer attention to relating illustrations to page numbers is necessary if the present format is to be perpetuated. I look forward to seeing this excellent guide again when it has overcome its teething troubles.

Winner of the £300 aquarium competition at The Aquarium Show '74 in London was 14-year-old Andrew James of Fenley, Surrey. His entry calculated the aquarium's water content as 78,597 cu. cm. and was the nearest to the measured volume of 78,480 cu. cm. In the picture Andrew is seen (right) on the occasion of the presentation by Mr Keith Barraclough, chairman of the Aquatic Development Group who were the organisers of the competition. The aquarium was donated by John Allan (Aquariums), and director Mr John Ransom is also in the picture (left).

Entries for the competition included ones by visitors from Scotland and Cornwall, and estimates varied from as low as 8 cu. cm. to 2½ million cu. cm. Andrew James has kept fish for 4 years and his fine new aquarium has pride of place in the lounge of his home.

Presentation of £300 Aquarium



BREEDING FANCY GUPPYS

Colour in Guppies

By F. CAMPBELL

THE two specialist guppy groups operating in the U.K. cling tenaciously to a set of standards based on the shape of the caudal and dorsal fins. In recent years, however, there has been a marked tendency to follow the example set by the rest of the guppy world and breed for colour rather than finnage shape.

This is not surprising, for the modern fancy guppy is indeed a dazzling creature and bears little resemblance to the fish that so impressed the Rev. R. J. L. Guppy in 1866 that he sent some to the British Museum for identification. Since those far off days the little fish, which eventually took its sponsor's name, has continued to delight and exasperate scientists and hobbyists alike. Many modern specimens might indicate that the ultimate has been reached but this is far from the case. Much has yet to be learned, particularly with regard to the apparently never-ending range of colour variations.

The earliest findings were probably those of Professor O. Winge, a Danish biologist, who died before his work was complete. He established that certain colour patterns, to which he gave distinctive names, appeared regularly in guppy inheritance. These still appear today but are not so much sought after as the self-coloured reds, blues and greens, the coveted cobra pattern, and the ever-popular half-blacks. The appearance of new and exciting patterns dates from the introduction of the scarftail and veiltail standards in 1950. From then on the caudal fins became wider and the colours more intense, culminating in the adoption of colour standards everywhere except in the U.K.

Before 1950 only once had colour been allowed to disturb the uniformity of the standards set by British breeders. The Robson variety, male and female, took the name of their breeder, Mr R. Robson, and were adopted by the Guppy Breeders' Society. Both sexes had the standard grey body colour with black fins, no other colours being present. The female followed

the outline of the only existing female standard and the male followed the shape of the roundtail male, with one exception: the dorsal of the roundtail male was stubby but the dorsal of the Robson male was long and pointed. There was obviously some linkage here between colour and finnage shape, but unfortunately Mr Robson met with a fatal accident in 1948 and his secret died with him. The production of Robson guppies ceased and the standard has now been dropped.

There are many examples of this affinity in the inheritance of certain colour patterns with certain finnage shapes, like the Viennese emerald double swords, a strain which has stood the test of time and for which special classes are still a feature of shows under the auspices of the Osterreichische Guppygesellschaft. Another interesting instance was the appearance in the early 1960s of a veiltail which differed from the standard veiltail outline insofar as the dorsal fin was short and stubby instead of being long and pointed, and the caudal fin was invariably black. This led to the adoption by the Fancy Guppy Association, which was then in its infancy, of a new standard called 'black veils' as opposed to the normal 'multi-colour veils'. This was short-lived, however, for fish began to appear with short dorsals and multicoloured caudals and the 'black' was dropped in favour of 'short dorsal'.

Basically all guppies are grey, the many and varied patterns we are familiar with being superimposed over the body. Basic body colours of gold, blond and albino are in evidence from mutations and subsequent selective breeding. These, however, are recessive and in any attempt at cross-breeding grey will reappear, even if two differing recessives are used. The study of inheritance of colour in guppies is filled with complexities, the great majority of which have yet to be resolved. We know that the genes for basic body colour are located on the autosomes, that is to say they are not sex-linked and are expressed

by both males and females. We also know that some of the superimposed patterns, such as half-black and snakeskin, and also some self-coloured caudals, are sex-linked and the question of whether they are expressed in males or females depends on whether they are located on the X or Y chromosome of the male. To add to the confusion, however, we might find that having determined that the factor for a certain colour pattern is Y-linked we discover that when combined with a certain linkage shape it moves over to the X chromosome!

Despite the difficulties encountered many true strains based on colour have been produced and the obliging guppy will reveal many more either by design or chance on the part of the breeder. Colour in guppies, as in other animals, is due to the production of pigment in the skin cells. These pigment cells are known as

chromatophores and are subdivided and named in accordance with their colour and function. The pigments may be massed or dispersed within the cell and varying degrees of motility are displayed, except in the case of the integrating types of chromatophores. These are probably the most important in determining the wide range of variation, owing to their ability to diffract or refract light producing colours which mingle with the colours of other chromatophores.

Variation in the brightness of light and the direction from which it comes, combined with the surroundings of the fish such as gravel, rocks and plants, can result in variation in colour. In other words, transferring a guppy from its normal environment to the confines of a show jar can often be a disappointing experience to the exhibitor.

Book REVIEW

WATER PLANTS OF THE WORLD by Christopher D. K. Cook, Bernardo J. Gut, E. Martyn Rix, Jakob Schneller and Marta Seitz. viii plus 561 pages; 266 figures. Dr W. Junk b.v., The Hague, 1974. Dutch Glds 120.

PUBLICATION of an up-to-date 'Manual for the identification of the genera of freshwater macrophytes' (this is the book's subtitle) is an exciting event for the water plant enthusiast, particularly when the work is one produced by professional botanists specialising in the aquatic field. Aquarium- and pond-keepers will be particularly pleased to know that this is not a botanical book for botanists only; it has been written with the requirements of all those who have practical interest in water plants very much in mind, whether these practitioners are hobbyists who regard the plants as beautiful, interesting and valuable adjuncts to their fishes or whether they are water bailiffs or hydroelectric engineers who think of them as pestilential weeds. Botanical terms are used, of course, but there is a Glossary which should soon solve any difficulties over the meaning of words new to the reader.

At the beginning of the book there is a 10-pages long Key for identification, the

flower of the plant providing the major tracking features, as is usual in botanical keys; however, many water plants do not readily oblige with flowers when growing fully submerged, and a further Key of 24 pages in the book, 'biased in favour of easily seen vegetative characters', is designed to get round this difficulty as far as is possible. This is the Key the authors recommend for the use of the 'non-specialist'. The rest of the book is arranged by plant families and their member genera, each plant genus being illustrated by a line drawing (some plants being illustrated for the first time).

Only scientific names are used for the plants; in their Introduction the authors say that 'the folly of citing local names was realised at an early stage in the preparation of this book'. The authors are right in seeking to promulgate the use of the scientific names but common names are still widely used, perhaps particularly by the readership for whom the book is written, so that it would have been helpful to have given a cross-referenced list of common names and scientific names as an Appendix.

This is a book that can be recommended to anyone who collects water plants or who needs to identify water plants, and any good 'aquatic' library should certainly include it.

A.E.

MARINIST'S Notebook

By ROY PINKS

CERTAIN species of fishes, commonly referred to as 'the brackish group', are of interest to a very wide range of fish-keepers. The freshwater enthusiast will find that he can keep some of them quite satisfactorily in fresh water, the brackish enthusiast has the whole field to choose from, and the mariner can also introduce a number of this group into his normal marine aquaria. Although there may be some debate over the matter it is often argued that the brackish fishes do better and look better in normal marine concentrations of salt water, and I would agree that in many cases this is so; a certain amount of experimentation remains to be done, in particular in relation to optimum periods of exposure to these conditions, and it seems likely that cyclic variations would give the best results, to imitate in some way the natural life cycle of the fish in question.

Of all the brackish 'possibles' for marine aquaria, there is no doubt that the mono (*Monodactylus argenteus*) is one of the prime favourites. This fish, which hails from the coastal areas of Africa and Malaya, is shaped like a flattish diamond and is predominantly silvery. Two black lines from top to bottom in the foreparts are complemented by a black lower edge to the pectoral fin, and a yellow-orange coloration to the upper area of the dorsal. This fish is a bold and dashing personality, always on the move and never bored. It seldom indulges in the purposeless excursions up and down the front glass which typifies so many other really active fishes. Instead, it seems to have method in its ways, and only fails to give of its best when kept in too few numbers or under inferior water conditions. It shows a little temperament when undergoing attunement to changed conditions, and may need some encouragement.

Once it has begun to feed the mono seldom looks back, and one's main prob-

lem then centres around just how much its ration should amount to. Its tastes are quite wide, and I have never found it a fussy feeder, though it obviously likes as much live food as it can get. Specimens are usually obtainable from about 1½ inches to 3 inches, though in Nature they grow to over 8 inches. In good conditions they grow quickly, but lack of swimming space does seem to stunt their growth. Strangely, their bodies appear to cease growing after a certain point, yet their eyes continue to enlarge, rather out of proportion to the remainder of the body.

Happiest in a shoal, this fish must rank with the *Hemiochus* as one of the handsomest species when displayed as a group, and we should always try to give them an opportunity of following their inborn instincts. Some will develop distinct snappiness, especially towards other species, but this is not unusual in the saltwater aquarium, and in the case of the mono it seldom assumes the savage proportions which we so often see in the truly marine species. The precise pattern of the mono's life history is still not very clear, and in view of its peregrinations into and out of fresh water the likelihood of our persuading it to breed under conditions of captivity is pretty remote. It is not simply a matter of providing variations in the quality of our water, but of providing the full scale of environmental gradations which accompany them, and in particular this includes the available food species for both adults and fry.

Regrettably, the mono is seen, as often as not, with body and fin blemishes during its post-importation period, and great care should be taken only to buy specimens in perfect condition. It seems that their resistance is particularly low during this time by comparison with many other species, and I have found that the usual medications have failed to arrest the

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Coppery Tetra from Brazil



Hyphessobrycon griemi

By RUDOLPH ZUKAL

Photographs by the author

Translated by F. MARSH

THIS coppery-coloured characin is very similar to the flame tetra (*Hyphessobrycon flammeus*), not only to look at, in its coloration and form, but even in character and behaviour. There are small differences but these can be seen more easily when the two species are viewed side by side. *H. griemi* has a transparent body coloured russet to olive-brown and a silvery belly with a goldish tinge. Behind the jaws are two vertical dark bars on a goldish yellow background. Dorsal, anal and caudal fins are copper red with milk-white tips. The edges of the scales are dark-hued. *H. griemi* are also closely related to *Hyphessobrycon bifasciatus*. They were first imported from near Goyaz in Brazil in 1936. This little tetra (it grows only to about 1½ in., 3.5 cm.) is very modest in its requirements, being satisfied with a water temperature of 64°F (18°C) upwards and just a smallish tank, well planted but not too brightly lit. It can even stand a lower water temperature than this but then, unfortunately, the beautiful red fin coloration fades. They are an undemanding and peace-loving species, ideal for a community tank. Nor are they choosy with regard to food. And they are just as easy to breed as they are to keep.



In the picture of *Hypessobrycon griemi* on the preceding page the left-hand fish is the male. Photographs of the pair on this page were taken just before spawning.

The sexes are easy to distinguish in the adult fish because the female is fuller in the belly and the slimmer male has a white border to his scales. *H. griemi* spawns freely throughout the year. For breeding purposes a temperature of 75°F (24°C) is used and only a small to medium-sized tank is needed. This need not have any bottom medium in it, and a few fine-

leaved plants can be added, although if a tank is available that does have gravel then it can certainly be used. Ordinary tap water is suitable but preferably it should give a neutral (about pH 7.0) reading. It can be left to stand for a few days and aerated well. The male can be added to the tank a few days in advance of the female but no harm is done if both fish

After display by the male and his chase of the female the pair swim closely together and their bodies quickly enfold one another, the eggs simultaneously being released and fertilized.



As the fish separate from the embrace the numerous tiny eggs are scattered in the water to fall on to plants and gravel



Spawning of *H. griemi* can also take place close to the water surface, as shown in this picture

Eggs are seen in the water in this picture of the pair separating after their surface embrace



are put in the tank at the same time. Usually the courtship procedure will start on the following day.

During the spawning much harmless chasing takes place. The male displays vigorously and tries to reach the female's belly with his jaws. Sooner or later the fish bend round each other, there is a movement that cannot be caught by the human eye (since we are dealing with fish barely 1½ inches long), the fish fall apart and the eggs fall freely on to the plants and the bottom on the tank. The spawning

act is repeated several times and the whole process lasts about 2 hours. During the spawning the eggs are safe but once this has finished the parent fish must be removed. Like others in its genus it shows cannibalistic behaviour.

The eggs are numerous and may amount to 200 or more. The fry are free-swimming on the sixth day and at first stay near the bottom of the tank. At this time they require the finest live foods. At 8 months the young fish reach maturity.

Japan's Society for Koi Keepers

THE following is extracted from a message from Dr Takeo Kuroki, president of the All Japan Koi Keepers' Society (Zen Nippon Airin Kai), sent to the chairman of the British Koi-Keepers' Society, Mr E. Allen. It gives some details of the Japanese koi society.

"It is my great pleasure that for the first time I write to the chairman and the members of The British Koi-Keepers' Society. It was a few years ago that information of your Society was made known to me by the Shumposha Publishing Co., who publish the magazine Rinko for our Society, Airin Kai. At that time, we had no previous knowledge of your Society, but since then we came to know more from Dr Masayuki Kawaguchi, a member of our Kyoto Branch who advised me earlier this year by letter, and from Mr W. R. Seal with whom I exchanged opinions on the phone during his stay in Japan.

Today, we would like to present copies of our magazine Rinko, to you through Mr Sigezo Kamihata, and we hope you will note the articles of introduction on your activities in Great Britain as given in volumes nos. 77 and 79.

We were much surprised to know that your Society was already established and organised, as there has been little instruction and assistance from Japanese people, and to know how enthusiastic your members are in koi keeping.

When I visited California last year, I was also surprised to find that so many Americans love koi and that an American Koi Keeping Society existed. However, we are more surprised at the people like you who love them so much because you do not have the same historic connections with Japan.

The Japanese Koi Keepers' Society, Zen Nippon Airin Kai, is the biggest organisation of koi lovers in Japan and has 8000 members, with Branches abroad in Los Angeles, San Francisco, Hawaii, Korea and Taiwan. All our members are pure amateur and we have the magazine Rinko, published for Japanese readers only, but in the near future when regular subscribers exceed 1000, we are prepared to publish Rinko in English.

Our Society is supported by a group of businessmen, and Mr S. Kamihata, the bearer of this message, has been a leader of this group since it was established. He is one of the most important founders of our Society, and he is the president of a large koi breeding company.

Having heard that some of your members are visiting Japan next Spring, we shall be glad to welcome you through our Branch network in each Prefecture of Japan, and look forward to meeting your members here."

Arrangements for the 14 days' visit to Japan and Thailand this year are now being completed and any reader interested in joining the party should write to Mr. W. R. Seal, 7 Highlands Road, Offerton, Stockport, Cheshire SK2 5HU, for details.

COLDWATER SCENE



By FRANK W. ORME

A Water-exchange System for Pond Clarity

• A Look Back at 1974

LAST autumn my wife and I travelled to Peterborough to visit two very enthusiastic koi addicts. The invitation was of long standing and the very warm welcome of Mrs Hilda Allen made our journey well worthwhile. Hilda, who is now the public relations officer of the British Koi-Keepers' Society, was for a long time the hardworking general secretary of the BKKS, and husband, Eric, is the Society's chairman, a position which he has also held for some time. At the time of our arrival Eric was at work, however. Their koi pool has become very well known; it is constructed of concrete paving slabs,

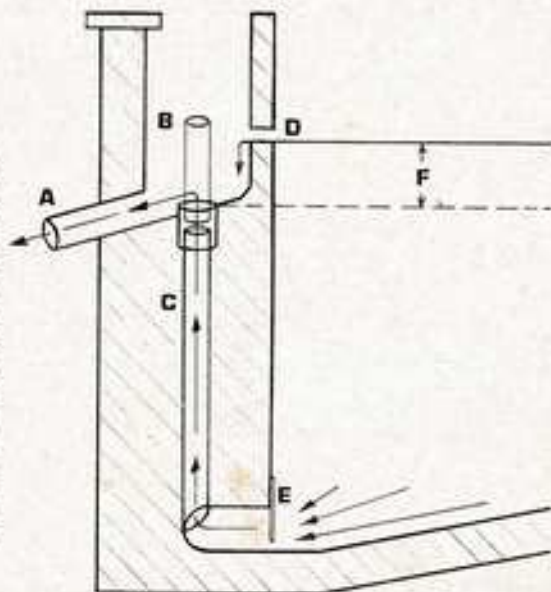
and occupies quite a large area of their garden at the rear of the bungalow.

A noticeable feature of this semi-raised pool was the clarity of the water, down to the relatively deep base. This ideal condition is achieved, and maintained despite the large number of fish, by means of undergravel filtration and a water-exchange system.

Basically this system involves installation of a form of concrete box, built on to the inside wall of the pool, above the deepest end. The base of this box is approximately 10-12 inches below the water surface; the top edge of the box is at the same

Water-exchange System for Koi Pond

Sectional view of the water-exchange system used by Mr and Mrs Allen of the British Koi-keepers' Society (drawing by E. Allen). Arrows indicate direction of water movement. **A**, Vinyl pipe (3 in. diameter) to drain. **B**, Extension pipe, reaching above water level when fitted, and when removed water and sediment flow forcibly up pipe **C** (2 in. diameter) from the pond bottom. **D**, Gap of 1 in. for surface overflow. **E**, Perspex grille (½ in. thick). **F**, A minimum distance of 8 in., according to volume of water change desired, is required between surface and top of pipe **C** (dashed line).



level as the upper edge of the pool wall. Through the base of the box pass two plastic pipes. The first is a vertical pipe, 2 inches in diameter, set so as almost to reach the pool bottom and with its top opening just sufficiently proud of the box floor to allow an extension pipe to be fitted. When in position this extension pipe reaches to the level of the pool water surface. Level with the base of the box is the second plastic pipe, of larger diameter and set horizontally, to carry waste water out of the pool to a convenient drainage point (Eric and Hilda Allen are fortunate in being able to discharge the water from their pool into a nearby stream).

In practice, fresh water is run into the pool, which causes an overflow via the upright pipe, into the box and out through the discharge pipe. Through a couple of large holes made in the walls of the box at water level, surface debris can also be flushed away. With the standpipe extension pipe removed the water gushes into the box with some force, which in turn creates a strong suction current that will draw up any mulm from the pool bottom.

Although my description of this water exchange system has, no doubt, missed out some of the finer points, I can assure readers that, upon the evidence we saw, the system works exceptionally well. The pool contained a large number of different varieties of koi, some fish being quite sizeable, and all appeared to be in perfect health, without any trace of bloom.

On our way back into the bungalow we paused to inspect a tank of young koi, ranging from 1½ inches to 2 inches in length, which had been raised from the egg stage. Needless to say, these fish were also in perfect health and full of activity.

My wife and I finally departed after a number of hours pleasantly spent looking at and discussing fish. These two devotees of the koi, Hilda and Eric Allen, who both spend a great deal of their time in furthering the koi movement, can indeed be justifiably proud of their pets.



During the year just passed two specialist associations came into being, both catering solely for those interested in the goldfish and its fancy varieties. The London area saw the birth of the Association of Goldfish Breeders, and in the Midlands the Association of Goldfish Keepers was

founded. Both organisations have grown since they held their first meetings and number some very well known personalities from the goldfish world within their ranks; some members travel considerable distances to attend meetings. It is within specialist groups, such as these, that the novice will find the most useful advice and help, with any problems, from people who have a common link, irrespective of experience, in their enthusiasm for particular varieties of fish. A great advantage in being a member of a specialist group is in knowing that you all have a similar interest and that meetings will be devoted, in some form, to that interest and not to some subject which might, for you, be found utterly boring.

If goldfish keepers in other areas were also to get together, and form groups similar to those of the AGB, the AMGK, and the longer established Northern Goldfish and Pondkeepers Society, I am sure that before long they would find many newcomers eager to become members — especially if junior members are encouraged. Given enough specialist groups of goldfish fanciers they would soon be able to develop their own voice, and speak with authority, on matters affecting their section of the fishkeeping hobby.

Open shows during 1974 appeared to improve. For instance, the Midland Aquarium and Pool Society staged the first of their 'new look' shows at Birmingham, under the banner of the First Midland Aquatic Festival. This show, which was open to the public for 3 days, comprised society stands in which the freshwater tropical fish were exhibited. Very sensibly, I feel, the coldwater section was unchanged and thus rows of tanks and top quality fish met the eyes of visitors as they entered the hall. Other competitive classes were staged for marines, killifish and herpetological exhibits by the respective specialist societies, and there were traders' stands and demonstrations in the art of setting up an aquarium and handling reptiles. All in all there was something to interest most visitors. For 30 years the MAPs show has been a premier attraction in the aquarists calendar and I feel sure that the Midland Aquatic Festivals will be no exception.

A little later in the year another top coldwater event took place — the open show put on by the Bristol Aquarists Society. Here we had a straight competitive open show — no society exhibits, no

traders' stands — just rows of tanks containing some of the country's best specimens of coldwater fish. In the main the visitors were goldfish enthusiasts and some travelled considerable distances to view the exhibits, which were greatly admired. In fact at the time of my visit the hall was quite crowded with the public eager to judge, for themselves, the quality of the fish on display.

It takes a lot of planning and hard work — usually by a dedicated few — to arrange and stage an open show, especially if it is to be on view more than 1 day. The Bristol show lasted for 2 days and the organisers must have been gratified to see the steady stream of visitors entering the hall. Bristol is, of course, one of the strongholds of the goldfish fancier and it was this society that, many years ago, developed the very popular shubunkin to which it gives its name! The present-day Society still attracts fish to a respected show, from many of the top goldfish exhibitors.

The British Aquarists Festival, a 2 days event organised by the Federation of Northern Aquarium Societies, was held in October at Manchester. Presented by the Federation of British Aquatic Societies, the 3 days Aquarium Show was also staged during October in the Royal Horticultural Society's Old Hall, London. Inevitably these, the two premier, shows were very alike. In both systems of exhibition by individual societies were used. Traders were at these shows in force, most of the bigger names being represented. The British Koi Keepers Society staged an exhibit at both venues and drew much attention. Of course the attending public loved it; lines of people queued patiently, at both Manchester and London, waiting to join the crowds who thronged the halls inside. Tropical fish were predominant, the goldfish making up a very minor part of the shows. A measure of how popular these two shows are is the fact that people were prepared to, and did, travel from as far as Scotland and the Isle of Wight.

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In 1974 the FBAS produced their new issue of the revised 'National Goldfish Standards'. The 'International Competitive Standard for Pedigree Goldfish Varieties' was presented to aquarists just a few months later from the Midlands. Goldfish exhibitors now have a choice of three

standards, including those of the Goldfish Society of Great Britain, and differing judging methods. Some societies use one set of standards, others use another, depending upon area and affiliations. Irrespective of any merits a particular set of standards might have, who can dispute that it would be much more sensible if there were only one standard against which goldfish were judged? Perhaps this coming year will see some movement towards reaching a compromise between the differing bodies which may, some day, lead to a single acceptable standard that will govern all shows.

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Some time ago I was asked why I mention some societies, in my articles, and not others. The answer was simple — some give me details of their activities, either through Newsletters or by writing, others do not! When an item is noted that I think would interest readers of PFM, I include it in my scribblings. If you have any news of coldwater matters that you think other readers would like to read about why not send me the information? I cannot promise that every item will receive publicity but I will write into 'Coldwater Scene' as many of the most interesting pieces of news as possible. Remember, I can only include such items when I am made aware of them.

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Readers who would like further information, or details of membership of the groups mentioned above, should write to the secretaries, including a self-addressed and stamped envelope for the reply. The addresses are:

British Koi-Keepers' Society, c/o 137 Gayfield Avenue, Brierly Hill, Staffs, DY5 2BX; Association of Goldfish Breeders, c/o 3 Rutland Road, Wanstead, London E.11; Association of Midland Goldfish Keepers, c/o 94 Newman Way, Rubery, Birmingham, B45 9LZ; Northern Goldfish & Pond-keepers' Society, c/o 28 Cumberland Road, Urmston, Manchester; Midland Aquarium and Pool Society, c/o 8 Redhill Road, West Heath, Birmingham, B31 3LD; Bristol Aquarists Society, c/o 10 Arch Grove, Long Ashton, near Bristol; Goldfish Society of Great Britain, c/o 107 Cobham Road, Seven Kings, Ilford, Essex.

American Water Purslane

By W. A. TOMEY

Photographs by the author

AMERICAN water purslane (*Peplis diandra*) was described as an aquarium plant over 10 years ago, but I have not yet found anything published about the culture of this beautiful American plant. The question is to what extent has it become familiar to aquarium hobbyists in this time? And in answer one could say that these small plants are, on the Continent, among the most beloved of aquarium plants.

Peplis diandra belongs to the Lythraceae family (cat's tails); this name has in fact been revised, and the plant is known as *Didiplis diandra*. The plants originate in the south eastern part of the United States, in Texas, Arkansas, Missouri, Minnesota and the west of Florida, where they grow in bogs and deep stagnant water, though they are to be found also emerge on the shore. They even flower under water as well as above the surface, although the



Left: part view of a well-planted aquarium including a clump of the American water purslane (to the right of the picture)

Above: this close-up enlargement of the plant reveals the tiny flowers at the junctions of leaves and stem

florescence is much richer when flowering takes place emerse; usually the small flowers do not open under the water and do not develop their fruits in these circumstances.

Peplis diandra is a real beauty with bright green tapering leaves that grow thickly on the thin, somewhat fibrous stem so that they look like small fir twigs. These leaves vary in breadth from 1.5 to 4.5 mm, and are about 4.5 mm. long. Near the top of the stem the leaves fade a little in colour and, depending on the lighting, may take on a somewhat reddish colour, while further down they are bright green.

The tiny flowers are not conspicuous but are very interesting and coloured greeny pink. These flowers are to be found at the base of the leaves and are only pin-head size. In order to investigate these flowers in detail a microscope or good lens must be used. Then we can see that they consist of a 2 mm.-long cone-shaped calyx; the stamens stand in the upper part of the calyx and the crown leaves are missing.

The fruit, which is also extremely small, consists of a roundish cap divided into two compartments that hold numerous rather prickly seeds.

The emerse form of this plant develops a stem 2½-4 in. high (5-12 cm.), the lower part creeping over the ground and showing very many fine roots. Under emerse conditions, the stems of *Peplis diandra* do not grow as long as they do when grown submerge.

It's not difficult to cultivate American water purslane because the plant doesn't require any particular bottom medium. It absorbs its nutrition through its green parts and with powerful lighting the plant can grow very quickly; growth can be helped along by removing the side shoots that will appear along the stems. We can use this particular little plant to best advantage in a spray to make marvellous contrasts in colour and form with the more usual aquarium plants. The best temperature for this sub-tropical jewel is in the region of 68°F (20°C).

Readers' Queries Answered



Live Food

There are some very curious little things showing up in the water with the daphnia I collect. They are very small, a rusty red colour and have two very long feelers. I am feeding them into my tanks with no ill-effects so far, but I should like to know what they are.

These are almost certainly *Diaptomus* (about 2 mm. in length), like *Cyclops* belonging to the copepod group of crustaceans, and likely to be found in the same waters as daphnia and cyclops. It is in fact the long antennae that are held at right-angles to the body that make *Diaptomus* recognisable. They feed on algae and

other small food particles which they 'sieve' out of the water, and they are very acceptable as food for those fishes that are quick enough to catch them, since they can 'leap' to safety from the jaws of a fish with great speed.

Aquarium Peat

How do I introduce peat into my aquarium tank without having it floating all over the tank? I want to put it under the plants but I have no success in keeping it there.

Try sewing the peat into a nylon net bag. You can make the bag of a size suitable for your tank and sew up the open end after the peat has been

placed in it. Use horticultural peat that has been well soaked previously and cover the bag over with your gravel.

Weedy *Cryptocoryne*

*My *Cryptocoryne blassii* was bought as a colour contrast but has been very disappointing for this purpose since it has grown very tall and weedy. How can one prune a *cryptocoryne*?*

Cryptocorynes are best left alone once they are established as they react very badly to being shifted about. Decrease the amount of lighting used above the tank somewhat (not too much so that other species are affected to their detriment) and try applying some side illumination to encourage the plant to put on side growth. A lamp with an adjustable head would supply a light source for side lighting. A tablet or two of plant nutrient placed in the gravel under the plant to one side of its main stem might also help.

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Marinist's Notebook

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problems of collapse due to body lesions and fin damage. Particular care should also be exercised in the selection of specimens with full bodies, and any tendency to thinness in the lower half of the body should be looked at askance.

The mono has no particular preference as regards temperature, though the nor-

mal marine range of 73-76°F (23-24°C) suits it nicely. It is said that on transfer to full salt water it displays its silveriness to maximum effect, and I think this is generally true, though it is hard to beat under brackish conditions. The transition to salt water must, of course, be effected gradually, and 2 or 3 days may not prove to be too much. I have no doubt that much more drastic conversions could take place without apparent damage, but I would not answer for the long-term consequences of such a course. Readers may have their own experiences to relate on this score.

Readers' Queries Answered

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Brambleheads

I have just brought in two brambleheads from an outside pond to winter indoors and I find that there is a sort of bloom over their heads, one being worse than the other. Should I take some sort of action or will this disappear now that they have been brought into the warm?

It is surprising that your fish have acquired a mucous covering so early in the winter. You should look to the condition of the pond if there are any other fish still in it, since the condition of the brambleheads would seem to indicate that the pond water is not in very good shape and if we have a long hard winter other fish left in it will undoubtedly suffer from pollution. Meanwhile the brambleheads should be given a salt dip every other day until the condition is improved. A small tankful of water in which are already dissolved and mixed two tablespoonsful of block salt or sea salt can serve as a bath, and remember that the temperature of all the water used both in the bath and in the permanent tank must be the same. The fish should be placed in this solution for 15-30 minutes, but

they must be watched carefully and if they show any sign of distress they must be quickly removed and placed in a clean, salt-free tank. Good feeding (with a little chopped garden worm), clean conditions and a few salt baths should restore the fish to health.

Oscars

I have just added two more oscars to a well-established tank of four and one of the newcomers is getting a continual buffeting. Is this likely to be sexual behaviour?

Yes, this may well be so. Since oscars are so very difficult to sex (they are sexually mature at about 4½ in. in size) jaw-locking and general tank disturbance may be the first sign that you have a pair in your tank. The female lays a large number of eggs on a flat stone (after thoroughly cleaning it), and they are then fertilised by the male. One or both parents may exercise parental care and the eggs hatch in about 4 days. As a first food, some 5 days after hatching, the brood will take newly hatched brine shrimp, and then powdered dry food, ground white worm, micro worm and scraped ox heart. The

fry require frequent and heavy feeding and because of this care must be taken to keep the aquarium water very clean.

Leporinus

How large will Leporinus maculatus grow and what special conditions do they require? My fish, just bought, don't seem at all happy in their new surroundings and are very nervous and subdued.

Leporinus maculatus will grow to a size between 4 and 4½ in. in length. It is necessary to have more details to judge why your fish are reacting in this way to their new home. You don't say how long you have had them but if they have been bought very recently and their new tank conditions are completely different from those they have been used to, then they are going to take a little while to settle in (make certain that the tank is well covered as they do have a tendency to jump). A temperature of 76°F (24°C) and slightly acid water all contribute to their well-being — and they will not react at all well to a newly set-up tank. They are normally active fish and will require plenty of swimming space, so a 3 ft. tank preferably should be used. Under suitable conditions they become hearty eaters and will take dried foods but live foods should be given and they must be given vegetable matter (lettuce, algae, spinach).

22nd November. No date has yet been fixed for the Open Show.

RESULTS of the NEWBURY & DAS Open Show are as follows:

Ag: 1. Mrs P. Jupp (Gosport); 2. Mrs G. Barrett (Newbury); 3. Mr M. Mewett (Salisbury). Ba: 1. Mr R. Adams (Salisbury); 2. Mr K. Smith (Rumymede); 3. Mr K. Hillier (Newbury). Bz: 1. Mr B. Blascoo (Basingstoke); 2. Mr P. Grosvenor (Rumymede); 3. Mr R. Goslow (Basingstoke). Ca: 1. Mr C. Turner (Cordell); 2. Mr H. Nicholls (Rumymede); 3. Mr T. Fraser (Basingstoke). Cb: 1. Mr K. Hillier; 2. Mr B. Blascoo; 3. Mr K. Smith. G2: 1. Mrs V. Lloyd (Ind); 2. G. 3. Mr C. Turner. Da: 1. Mr T. Winter (Southampton); 2. Mrs J. Hurlford (Newbury); 3. Mr D. Puchard (Tonbridge). Db: 1. Mr B. Blascoo; 2 & 3. Mr A. Weale (Southampton). Dc: 1. Mr L. Little (Bracknell); 2 & 3. Mr K. Rees (Gosport). D: 1. Mr P. Brown (Southampton); 2. Mr R. Saunders (Gosport); 3. Mr R. Adams (Salisbury). Ea: 1. Mr K. Rees (Gosport); 2. Mr T. Cripps (Newbury); 3. Mr B. Blascoo (Basingstoke). E: 1. Mrs V. Lloyd (Ind); 2. Mr R. Canning (Newbury); 3. Mr D. Weamans (Cordell). F: 1. Mr P. Grosvenor (Rumymede); 2. Mr D. Rees (Southampton); 3. Mr P. Roberts (Bracknell). G: 1 & 2. Mr B. Jones; 3. Mr P. Saunders. H: 1. Mr W. Knight (Gosport); 2. Mr T. Fraser (Basingstoke); 3. Mr T. Whitehead (Newbury). J: 1. Mr P. Rushbrooke (Reading); 2. Mr K. Rees (Gosport); 3. Mr T. Fraser (Basingstoke). K: 1. Mr B. Blascoo; 2. Mr J. Fraser; 3. Mr R. Onslow. L: 1. Mr A. Tull (Salisbury); 2. Mr B. Adams; 3. Mr K. Hillier. Ma: 1. Mr K. Hale (Gosport); 2. Mr D. Puchard; 3. Mr D. Weamans. Mb: 1. Mr R. Onslow; 2. Mr T. Cripps (Basingstoke); 3. Mr P. Grosvenor (Rumymede). O: 1. Mr S. Ridge; 2. Mr K. Hale; 3. Mr A. Smith. P: 1 & 3. E. G. T. Tester (Mid-Sussex); 2. Mr C. Ingham (Rumymede). Q: 1 & 3. Mr R. Canning; 2. Mr B. Blascoo. R: F.B.A.S. Championship, 1. Mr B. Blascoo; 2. Mr A. Davidson; 3. Mrs Newbury. S: 1. Mr L. Little; 2. Mr A. Daniels; 3. Mr W. Crockett. T: 1 & 3. Mr B. Blascoo; 2. Mr L. Little. Ualc: 1. Mr W. Crockett; 2. Mr R. Canning; 3. Mr J. Jupp. Ubr: 1. Green R. Rudland (Reading); 2. Mr W. Crockett; 3. Mr R. Onslow. V: 1 & 2. Green R. Rudland; 3. Mr A. Marshall. W: 1. Mr J. Jupp; 2. Mr R. Scaifeham; 3. Mr R. Scovlin (Bishop Cleeve). Z: 1. Mr B. Barrett (Newbury); 2 & 3. Mr L. Little. Xb: 1. Mr D. Sveridas; 2. Mrs Newbury; 3. Mr M. Chapman. Xc: 1. Mr C. Turner; 2. Mr B. Jones; 3. Mrs Newbury.

THE November meeting of BOURNEMOUTH AS opened with a welcome to the inter-club show to the visitors from Weymouth. The Society was very sad to hear of the loss of their president, Mr Scott Morgan, who died suddenly at the end of October. He was a greatly respected man and had been president for 14 years. He was a keen contributor to the Southern Areas Open Shows

and was very successful in this part of the fish-keeping hobby. His loss will not be quickly forgotten.

The evening's entertainment took the form of a film-slide show on *Corydoras*, the film show was very well done and members found it enjoyable and instructive. The speaker went into great detail with every fish shown. At the end of the meeting Weymouth had won by 13 points to Bournemouth's 11 points. Table show results:

Pairs: 1 & 2. Mr B. Coombes (Bournemouth); 3. Weymouth. Danis/minkow: 1. Weymouth; 2 & 3. Mr K. Gibbs (Bournemouth). Common goldfish: 1 & 2. Mr B. Coombes; 3. Weymouth. Pairs: 1. Mrs Sebb (Bournemouth); 2 & 3. Weymouth. Tui-tails: 1. 2 & 3. Weymouth.

WHEN the ASSOCIATION OF MIDLAND GOLDFISH KEEPERS held its AGM on Sunday afternoon, 3rd November, at The Foleshill Community Centre, Coventry, members attended from as far as Leicestershire and Worcestershire. The Committee was re-elected as follows:

chairman, Mr T. Roberts; secretary, Mr F. Orme; treasurer, Mr R. Manco; lay members, Mr M. Mason and Mr D. Denny. It was unanimously agreed that future subscriptions should be 50p for juniors up to 16 years of age, and £1.50 for members over that age; in addition it was also agreed to continue the practice of having each member pay 25p at each meeting attended. The Foleshill Community Centre has proved to be an ideal venue because of its easy access from the M6 motorway so it was decided to hold all future bi-monthly meetings there. Since the inaugural, March 1974, meeting the membership has grown from 11 to 24, comprising both new and 'old hands'. During the second half of the meeting the AMGK were privileged to view an 8mm film, produced by Mr T. Sutton, which featured his father, Mr T. Sutton Senior, in and around his fish house. Members witnessed the breeding preparations and subsequent spawning; feeding of the fry was shown together with the very large number of young fish raised. One particular sequence demon-

strated the dangerous nature of the water tiger; a big close up revealed the predatory instinct of this creature as it captured a fish larger than itself. A warm round of applause followed the conclusion of the film, which Mr T. Sutton Senior then answered questions on. The next meeting will be held during early January and visitors will be welcome. Further details of the Association can be obtained from the secretary, 94 Newman Way, Rubery, Birmingham.

AMERSHAM & DAS held their annual members' Open Show at their headquarters at the end of November. Some 30 members attended and benched a total of 116 fish to be judged by Mr and Mrs F. Watts. Class winners were:

Barks: 1. F. Speeding (Jer); 2. Mr D. Barrett; 3. Mr S. Jessop. Chazins: 1. Mr S. Thompson; 2 & 3. Mr D. Barker. Cichlids: 1 & 3. Mr A. Rollason; 2. Mr R. Harper. Labyrinth: 1 & 2. Mr R. Stepto; 3. Mrs M. Daniels. Egg-laying toothcarps: 1 & 3. Mr B. Jessop; 2. Mr D. Barker. Catfish: 1 & 2. Mr A. Rollason; 3. Mr R. Smeaton. Barbones: 1 & 3. Mr B. Jessop; 2. Mr R. Stepto. Loaches: 1 & 2. P. Guinness (Jer); 3. Mr S. Thompson. 1 & 3. Mr S. Jessop; 2. Mr R. Stepto. ay Egglayer: 1. N. Bishop; 2. Mr A. Rollason. ay Coldwater: 1. P. Daniels (Jer). Breeders class: 1. Mr R. Harper; 2. Mr A. Rollason; 3. Mr K. North. Furnished show jar: 1. Mr S. Thompson; 2. Mrs W. Thompson; 3. Mr K. North.

Prizes were presented by Mrs K. North. Mr A. Rollason won the Best Fish in Show plaque (for a cichlid). The Highest Pointed Junior Fish trophy was won jointly by N. Bishop and P. Daniels. The Special prize for the member with most entries went to Mr D. Barker (27 fish).

THE members of the NORTHERN SECTION of THE BRITISH KOI - KEEPERS' SOCIETY again provided and staged an attractive Stand at the BAF. A pond containing large koi was backed with a Japanese-style mural, cut-out model koi and an array of conifers, all illuminated by coloured spot-lights. As in previous years, Northern members were available to give information to the general public who were fascinated by the koi.

The Society's fourth Autumn Meeting was held at the Royal

Yeovil & District AS Presentation



Yeovil and District AS guests and trophy winners photographed at the Society's annual dinner and presentation ceremony. From left to right: Mrs P. Gillam, Miss L. Gridley, Mr K. John, Mr T. Rendell, Miss K. Rendell, Mr J. Axe (treasurer), Mr P. Gillam, Mrs N. Stainer, Mr S. Langdon (the Society's president), Mr P. New (secretary), Mrs P. New and Mrs S. Langdon.

Horticultural Hall during the Aquarium Show in London, by kind permission of the organisers. Mr Roland Seal spoke about his recent trip to Japan which was made to finalise the arrangements for the Society's tour of Japan in April. Many slides were shown to illustrate all aspects of Japanese koi-keeping, as well as the beautiful places to be seen during the 16-day visit to the Far East. Mr Eric Allen, the Chairman, showed a selection of slides on his own methods of pond construction, water-changing and filtration, for the benefit of new koi-keepers.

At the Aquarium Show, hundreds of people visited the Society Stand, centred around a large pond containing a variety of koi, which was provided and manned by willing members from the home counties. There is ever-growing interest in keeping koi (the Society's membership now numbers 535) and anyone requiring details of membership should contact Mr D. C. Davis, 137 Gayfield Avenue, Brierley Hill, West Midlands, DY5 2BX. For details of the forthcoming visit to Japan, please contact Mr W. R. Seal, 7 Highlands Road, Offerton, Stockport, Cheshire SK2 3HU phone 061-483 9075. Mrs H. Allen is now the Society's P.R.O. Her address is: 1 Anthony Close, Peterborough PE3 3XU.

DORCHESTER & DAS have released an absorbing film pro-

duced by the FBAS on plants for the tropical aquarium. Another very popular programme was that given by Mr Casey of the Dorset River Authority on water chemistry. The general discussion that followed provided many surprises to club members, including the fact that local waters vary considerably within a 20-mile radius. The 'Night of Champions' table show followed and winners were: 1, Mrs I. Christopher; 2, Mr P. Connors; 3, Mrs J. Belt.

The annual dinner, held in November, proved to be the best ever. Presentation of the

table show winners' Cups was made by the chairman, Mr A. Cornick. Results were: Section 1, Mr R. Christopher; section 2, Mr G. Fox; juniors, Master Roy Christopher. Meetings are held on the second Thursday of the month at the Youth Centre, York Road, and new members are very welcome.

AUTUMN activities at BETHNAL GREEN AS started with an entertaining evening at which Mr R. Esson (FBAS) gave a talk with slides on native and foreign coldwater fishes. At the Catfish Association's end of year 'Champion of Champions' table show, Bethnal Green were doubly successful. First place in class G was won by Mr A. Haley and first place in class H by Mrs S. Hedges. The Society were hosts in November for the final night of the Area group table shows and earned 37 points, finishing in first place. The Society's furnished and aquascape classes for the area group were held at the Fur, Feather and Aquaria Show at which Bethnal Green took first place in both classes. The winners were Mr Tony Koderovitch and Mr G. Dallanegra. The annual Championship trophy for the area group was won by Bethnal Green.

YEOVIL & DAS is again intending to repeat last year's highly successful film show on Wednesday 5th March, and the Society extends a warm welcome to any aquarist who would like to attend. It is to be held at 7.30 p.m. at the Society's usual meeting place, the Moose Centre, St Michaels Avenue, Yeovil, and visitors can be assured of an enjoyable evening. The secretary, Mr P. C. New, will be pleased to supply further details (8 Mayfield Road, Yeovil, Somerset; phone Yeovil 24225).

THE WALTHAMSTOW & DAS Open Show attracted 679 entries of which 602 were benched and judged to FBAS standards. The best fish in the Show was an *Epilplatys coperi angona* exhibited by C. & K. Thomas of Walthamstow and the FBAS trophy for breeders coldwater was won by Mrs K. Wooley of Saracens AS. The trophy for the Society with the greatest number of points (excluding Walthamstow) was won by Bethnal Green AS. Details of the results are:

Aa-b: 1, Harlow AS; 2, Bessal Green AS; 3, Walthamstow. **Ag:** 1, Mr B. Mrs Tolland; 2, Mr K. Lewis; 3, Mr R. Hard. **Ak:** 1, Mr B. Mrs Salbury; 2, Mr S. Emptage; 3, Mr D. North. **B:** 1, Mrs D. Crutchshank; 2, Mr S. Cowell; 3, Mr P. Coyle. **Ca:** 1, Miss R. Coyle; 2, Mr G. Brent; 3, Mr D. Ingles. **Cc:** 1, Mr R. Vanderhoeve; 2, Mr J. Brown; 3, Mr P. Coyle. **Cd:** 1, Mr J. Brown; 2, Mr B. Mrs Gately; 3, Mr R. Vanderhoeve. **De:** 1, Mr B. Mrs Hubert; 2, Mrs M. Netherell; 3, Mr R. Thoday. **Ea:** 1, Mr A. Thacker; 2, Mr W. Terry. **Eb:** 1, Miss F. Rogers; 2, Mr D. Snow; 3, Mr A. Chandler. **F:** 1, 2, B, 3, C, D, K. Thomas. **G:** 1, Mrs M. Netherell; 2, Mrs S. Hedger; 3, Mr S. Adams. **H:** 1, Mrs S. Hedger; 2, Mr P. Moye; 3, Mrs M. Netherell. **I:** 1, Mr I. C. Killingsbury; 2, Mr S. Mason; 3, Master C. Chownight. **K:** 1 & 2, Mr P. Moye; 3, Mr T. Howles. **L:** 1, Mr A. Feast; 2, Master T. Coyle; 3, Mr O. Windsor. **M:** 1, Mrs S. Hedger; 2, Mr G. G. Wood; 3, Mr R. Thoday. **N:** 1, Mr M. H. Smith; 2, Mr S. Adams; 3, Mr T. Macdonald. **O:** 1, Mr I. C. Killingsbury; 2, Mr M. Bradford; 3, Mrs M. Netherell. **P:** 1, Mr I. C. Killingsbury; 2, Mr B. Mrs Fry; 3, Mr A. Noronha. **Q:** 1, 2, B, 3, Mr J. Peaston. **R:** 1 & 2, Mr M. G. Smith; 3, Mr E. Mason. **S:** 1, Mrs M. Netherell; 2, Mr P. Roberts; 3, Mr W. Terry. **T:** 1 & 2, Mr D. Chasewright; 3, Mrs D. Crutchshank. **U:** 1 & 2, Mrs S. Hedger; 3, Mr R. Eason. **V:** 1, Mr E. Cook; 2, Mr T. Bullock; 3, Mr R. Eason. **W:** 1, Mrs

S. Hedger; 2, Mr D. Goodbody; 3, Mr S. Peacock. **Xb-m:** 1, Mr J. Best; 2, Mr F. Moye; 3, Mrs K. Wooley. **Xc:** 1, Mr M. G. Smith; 2, Mr D. Chasewright; 3, Mr A. Noronha. **Xd:** 1, Mrs K. Wooley; 2, Mr W. Woodward; 3, Mr B. Cook. **Z:** 1, Mr A. Chandler; 2, Mr M. G. Smith; 3, Mr A. Chandler.

In Brief...

... AT the **NEWBURY & DAS AGM**, the retiring chairman, Mr Swait, was sincerely thanked and made president in appreciation of all the hard work and service he has given to the Society. The Society's Perpetual Table Show trophy was presented to Mr R. Canning.

... **LOUGHBOROUGH & DAS** held their annual Furnished Aquaria Exhibition at the John Storer House in aid of that foundation. Mr M. Chafer won the Furnished Aquaria shield (2, Mr S. Purdy; 3, Mr G. Howe).

... 82 entries were benched at the Open Show held by the **MANCHESTER SECTION OF THE FANCY GUPPY ASSOCIATION**. Mr A. Charlton won the Best in Show award with a male snakeskin topsword guppy. The Show was held in the Tudor Room, Longsight Hotel, Belle Vue, where the Section meets on the first Sunday of each month. New members and visitors are assured of a friendly welcome.

... THE recent table show for the Novices trophy, open only to members of the **SOUTH PARK AQUATIC (STUDY) SOCIETY**, attracted 26 entries. Whilst Mrs M. Dudley and Mr P. Biernacki judged the fish Mr W. Leach gave a talk on 'Winter Pond Care'. Mr D. Seymour won the Novice trophy with a bubble-eye goldfish. Singletails: 1 & 3, Mr G. Herring; 2, Mr D. Seymour. Twintails: 1, Mr D. Seymour; 2 & 3, Mr G. Strutt. Native & foreign: 1 & 2, Mr R. Trim; 3, Mr G. Herring.

... AT a recent meeting the **PETERBOROUGH FISHKEEPERS' ASSOCIATION** expressed their sympathy for the wife and family of the late Mr T. Harris, a founder and former chairman of the Association, who died recently. Members of Spalding & DAS were welcomed as guests to hear Mr E. A. Allen, chairman of the British Koi-Keepers' Society, give an illustrated talk on pond construction, water filtration and koi-keeping in Japan and Britain.

... A NEW Society, chaired by Mr G. T. Liddle, has been formed on Tyneside. The **BIMBI AQUATIC & STUDY SOCIETY** meets fortnightly on Thursdays at 7.30 p.m. above the Bimbi Fish Restaurant, Durham Road, Birtley. For further details please contact the secretary, Mrs P. J. Archdale, 47 Aberfovie, Ouston, Chester-le-Street, Co. Durham DH2 1RH; phone Birtley 4307.

... **SUFFOLK AQUARISTS & PONDKEEPERS ASSOCIATION** have presented a fish tank to a Senior Citizens Hostel, Annet Court. Members have recently enjoyed a 'mystery' lecture by Mr Pxe, which turned out to be a question-and-answer session based on a slide show. Members were able to display their knowledge (or lack of it) of the hobby and many scored very high marks.

... **NOVEMBER** was a month filled with activity for members of **BRADFORD & DAS**. The



Society's 27th annual Open Show was the highlight of the month, but there were also two Society meetings that included a fish discussion night and a talk on fish photography by the president, Mr J. Cawthra. The annual Home Aquaria competition for the Sharp trophy was also held.

COVENTRY P & AS members much enjoyed the talk by Mr Phil Jinks on guppies. At the Coventry M.A.L. Show the Society came joint third with Hinckley (1, Bedworth; 2, Spa), the overall result now being: 1, Bedworth; 2, Coventry; 3, Spa.

A TALK on setting up a fish tank, by show secretary Mr C. R. Chamberlain, that included instructions on glass cutting and testing rocks for lime content, proved very helpful to both the novices and veterans of **LEAMINGTON & DAS**. Another very practical lecture was given by Mr Bill Gunthorpe (chairman) on aquarium electrics. The Society also enjoyed a slide show on the Fish & Gill Club run by the inmates of an American prison.

GLOUCESTER AS held their November meeting as usual at the Old Tuffley Community Centre, Gloucester and some 20 members enjoyed a lecture and slide show by Miss B. Ryan on 'From the Stream to the Tank'. Members have enjoyed a visit to the BAF and a six-a-side inter-club competition in which Gloucester came fourth, with Mr G. Dixon winning the shield for Best Livebearer in the Show. A recent jumble sale gave a great boost to club funds.

NEARLY all of the Society's members were present when **BOUNSLOW & DAS** held its annual general meeting at the

end of November. In the reports on the Society's activities and progress throughout the year very high praise was accredited to the Committee for their untiring efforts to make such a resounding success of all the

Society's functions and endeavours, especially in the field of recruitment of new members. It was also noted with pleasure that the club's financial status was far in excess of the previous expected amount.

Dates for Your Diary

18th January. **GOLDFISH SOCIETY OF GREAT BRITAIN** meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

1st March. **FRAS** Assembly, Conway Hall, Red Lion Square, Holborn, London, WC1, 2.30 p.m.

1st March. **CATFISH ASSOCIATION OF GREAT BRITAIN** 2nd Open Show (catfish only), St Saviour's Church Hall, Cobbold Road, London, W12. Details: Mr D. Lambourne, 7 Wheeler Court, Plough Road, London, SW11 2AX; phone 01-223 2630.

15th March. **HENDON & DAS CONGRESS**, Whitefields School, Clarendon Road, London, NW2. Speaker: Mr W. A. Tomes from Holland.

16th March. **DON VALLEY AS** Open Show, Staff Dining Rooms, British Steel Corporation Works, Stockbridge, nr Sheffield. Details: Mrs E. Hatley, 11 Hall Road, Wark, Yorks. Home Common, Bannockley, Yorks.

22nd March. **GOLDFISH SOCIETY OF GREAT BRITAIN AUM**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

22nd March. **WORKSOP A & ZS** Open Show, North Notts College of Further Education, Blyth Road, Worksop, Notts. Schedules: Mr A. Mawson, 66 Waverley Way, Mansion, Worksop, Notts.

31st March. **SOUTHAMPTON AS** Open Show, The Avenue Hall, The Avenue, Southampton. Details: Mr D. Mills, 30 Fernside Way, Etchme Park, Southampton.

5th April. **RIVERSIDE AS** Open Show, St Saviour's Church Hall, Cobbold Road, London, W12.

12th April. **WARRINGTON AS** Open Show, Parr Hall, Palmira Square, Warrington. FRAS Rules. Schedules: Mr J. Higham, 42 Hood Lane, Sankley, Warrington, Lancs WA9 1EA; phone 28339.

12th April. **NELSON AS** Open Show, Nelson Civic Centre, Stanley Street, Nelson, Lancs. Details: Mr R. McKenna, 52 Bath Street, Nelson, BB9 6NP.

12th April. **CORRINGHAM & DAS** Open Show, Details: Mr D. C. North, 128 Bourne Road, Stamford-le-hope, Essex.

19th April. **YATE & DAS** Open Show, King Edwards School, Yate, Nr. Bristol (New Venue). Schedules: Mr C. Sockland, 20 Burgate Close, Chipping Sodbury, Bristol BS17 6DZ.

19th April. **REIGATE & REDHILL AS** Open Show, Market Hall, Redhill, Surrey.

20th April. **COVENTRY POOL AS** Open Show, Templars Junior School, Tilsall Lane, Coventry. Booking: 11.00 a.m.-1.00 p.m. Schedules (large sale): Mr S. Woodridge, 23 Lime Tree Avenue, Tilsall, Coventry.

20th April. **MERSEYSIDE AS** Open Show, Rainhill Village Hall, Exchange Place, Rainhill, Lancs. Details: Mr B. Wilson, 3 Thorpe, Skelmersdale, WN8 8DD, Lancs.

10th May. **SOUTHEND, LEIGH & DAS** Open Show, St Clements Hall, Leigh-on-Sea, Essex. Club and individual furnished aquaria, aquascapes, marines and junior classes. Details: Mr D. Dunham 1172 Trinity Road, Southend-on-Sea; phone 610576.

26th May. **GOLDFISH SOCIETY OF GREAT BRITAIN** Meeting, Conway Hall, Red Lion Square, Holborn, London, WC1, 2.00 p.m.

26th May. **CORBRY & DAS** Open Show, Corby Civic Centre, FRAS Rules. Schedules: Mr A. Siew, 176 King Street, Kettering, Northants. (mid March).

1st June. **NEWCASTLE TROPICAL FISH SOCIETY** Open Show, St Johns Church Hall, Westgate Road and Granger Street junction, Newcastle-upon-Tyne. Schedules shortly: Mr L. R. Lawson, 24 Grosvenor Road, Jesmond, Newcastle-upon-Tyne 2.

1st June. **HAVANT & DAS** Open Show, The Mancheston Hall, Hornsea, Hants. Schedules: Mr K. Taylor, 3 Holybank, Clasp, Coppland, Hants; phone Roman Way 4140.

14th June. **DUNMOW & DAS** Open Show, Details: Mr A. V. Gail, 36 River View, Braintree, Essex, CM7 7HX.

26th July. **GOLDFISH SOCIETY OF GREAT BRITAIN** Meeting, Conway Hall, Red Lion Square, Holborn, London, WC1, 2.00 p.m.

10th August. **GRIMSBY & CLEETHORPES AS** Open Show, Memorial Hall, Cleethorpe, Schedules: Mr T. P. Walker, 51 Chesters Walk, Grimsby, 5th Humberside; phone Healing 7576.

24th-26th October. **THE AQUARIUM SHOW '76** at the Royal Horticultural Society's Old Hall, Vincent Square, London SW1. Presented by the Federation of British Aquatic Societies. Aquarium society fishkeeping exhibits invited. Details from the organiser, PFM, 554 Garratt Lane, London SW17 6NY; phone 01-947 2805.

23rd Nov. **GOLDFISH SOCIETY OF GREAT BRITAIN** Meeting, Conway Hall, Red Lion Square, Holborn, London, WC1, 2.00 p.m.

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NEW, FBAS National Goldfish Standards and Technical Information Booklet No. 4. 19 pages; 23p each post free. P.F. Publications, 554 Garratt Lane, London, SW17 0NY.

GOLDFISH SOCIETY OF GREAT BRITAIN STANDARDS BOOK. Revised (1972) 40-page publication. Standards for 13 approved fancy goldfish varieties, illustrated in line. 40p post paid. P.F. Publications, 554 Garratt Lane, London, SW17 0NY.

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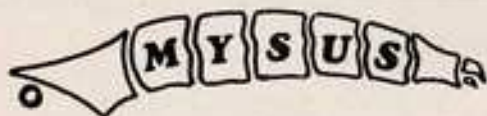
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