

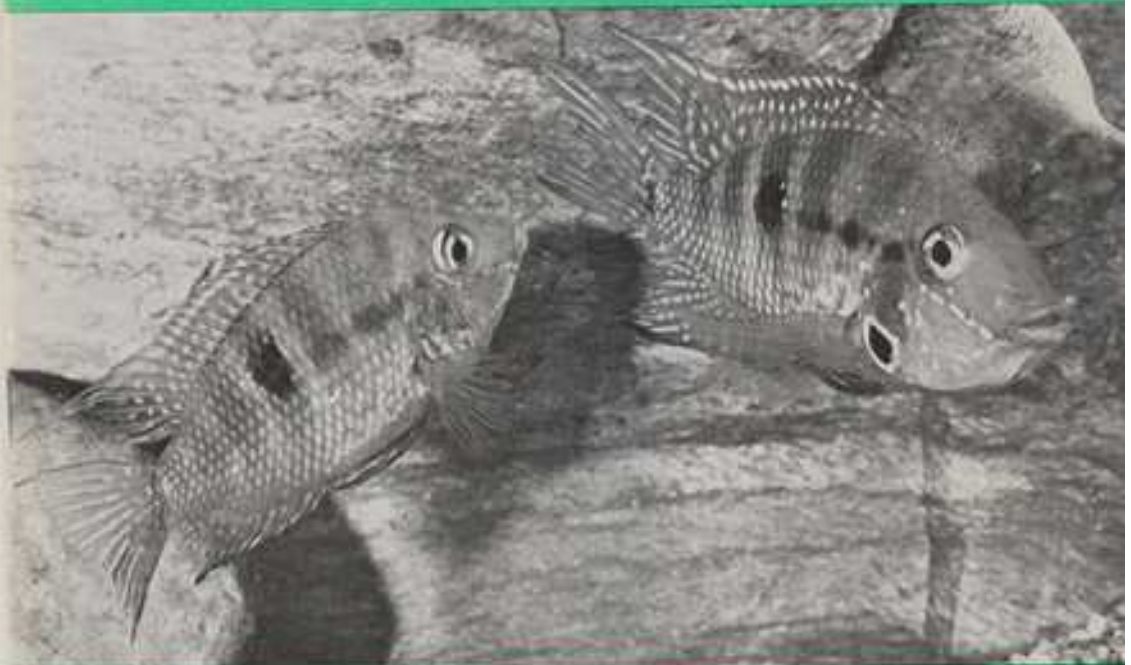
FEBRUARY 1974

20p

# Pet Fish

monthly

*The* PRACTICAL FISHKEEPING MAGAZINE



**Contents include:**

Breeding the Firemouth Cichlid

An Aquarium Arum

Coldwater Scene

Readers' Queries Answered

Growth of Fry

Breeding Technique Appraisal

Tropical Marine Invertebrate

Readers' Letters etc.



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# PetFish

**Monthly 20p**  
Vol. 8 No. 10  
February 1974

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# Comments and Quotes

- Cautionary tale of a USA aquarist
- When is a fish...?

## Insurance and Aquaria

A SALUTARY caution for aquarists who have large aquaria in furnished rooms has been given in a story from the USA that was featured in TROPICAL FISH HOBBYIST (USA) (December, 1973). It concerned a Nebraskan aquarist, Mr Richard H. Miller, who last year experienced the disaster of having 55 gallons of water from his broken aquaria flood and ruin a number of furnishings in a room of his home.

Mr Miller found that his household insurance policy covered him for 'Accidental discharge, leakage or overflow of water or steam from within a plumbing, heating or air conditioning system or from within a domestic appliance'. An aquarium, Mr Miller decided, was a domestic appliance, and filed a claim on the insurance company. Unfortunately, this was rejected by the insurance company, who did not interpret 'domestic appliance' as applying to an aquarium.

Although the story has a happier ending, inasmuch that by Mr Miller's persistence and appeal to a county court the insurance company was ordered to settle his claim, it does reveal that an aquarist in such circumstances can find himself involved in a great deal of trouble to obtain redress. Obviously all depends on the wording of the household policy, which it is advisable for anyone at risk to check and verify with the company concerned that damage from a mishap to an aquarium would indeed be covered. One policy we have looked at used the formula 'Loss, destruction or damage by . . . bursting or overflowing of water pipes, water apparatus and water

tanks (excluding damage caused thereto)'. Although there is undoubted scope for argument here about application to aquaria it would seem unlikely that a reputable company would invoke it. However, our view is that we would rather not form a 'test case', and we gratefully pass on the tale of Mr Miller's experience for the benefit of aquarists who like to be prepared.

## All in the Air

THERE'S nothing new under the sun, it so often seems. Wrangles over what to call a particular kind of animal, or indeed what constitutes an 'animal', by non-zoologists and especially by officials of various kinds, never fails to remind us of the ancient PUNCH cartoon in the lengthy caption to which the portrayed elderly railway porter delivers himself of the verdict that '... a tortoise is a hinsect and as such travels free'. Well, according to considered legal opinion in a court case reported last month, that perfectly respectable member of the crustacea, the prawn, is also an insect. At least they got it right that it's not a fish. Now they have to consider whether such a creature can be the object of cruelty.

The officials who drafted the current Electricity Control Order 1973 obviously have a little difficulty over knowing what is what in the living world: the Order includes the phrases 'live animals or birds', 'animals, birds or fish'. What, we wonder, do they think fish and birds are, if they're not, according to them, animals—plants? It might be thought that in the twentieth century most

people would have proceeded rather beyond a primitive classification that distinguishes only between what lives on land, what lives in the air and what lives in water. Even this train runs an advertisement section headed 'Animals and Birds'. So much for all the excellent television natural history material that should set such simple notions to rights.

An incidental rather interesting distinction emerged in the case of alleged 'cruelty to prawns' mentioned above. It was said that under the

Animals Protection Act fish 'in captivity' enjoy protection from acts of cruelty whereas those in the wild do not. How, we wondered, do anglers

stand in relation to ponds and lakes which they make and stock with captive fish for their practice of the gentle art of inflicting injury!

**THE TYNE-TEES AREA ASSOCIATION OF THE FBAS** are holding a Convention on 24th March 1974 at the Bay Hotel, Seaburn, Sunderland. There will be lectures, films and slides and the speakers will include the eminent ichthyologist Dr Ethelwyn Treweek of the British

Museum. Tickets (£3 including buffet) may be obtained from Mr K. Low, 2 Farn Bank Road, North Gosport, Middlebrough (phone 34433), Mr G. T. Liddle, 2 Craner Avenue, Lee Fell, Gateshead NE9 6UJ and Mr R. Appley, 3 Barnes Park Road, Sunderland.



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

### Problems and Consequences

IT does seem that a lot of the national problems are going to brush off on our hobby—scarcity of plastics, problems of air freight as well as immediate worries about electricity cuts. But I think myself that the petrol situation might be one thing that will be good for the hobby, if it makes people think twice about putting on an open show. More and more clubs seem to be having one—there are too many to visit—and just not enough competitors to enter them all so that some clubs are badly disappointed each year by attendances and often suffer financial loss. Why can't a few clubs amalgamate their efforts? Better prizes and more people to do the work make a better show and do more for the image of the hobby.

T. DARRIN  
Warrington, Lancs.

### Not for Fish

IT gave me quite a feeling of pleasure this week to find the existence of pet fish officially acknowledged even if it was only on the back of a tin of Pest Powder for Cats and Dogs purchased from Boots. In the instructions, among the warnings against allowing it near food or children, it states 'Keep away from fish. Remove fish bowls before using'. I don't think I've ever seen such a notice before, but I must say I wondered what catastrophe it needed to draw the manufacturer's attention to this. Had someone stopped their dog scratching only to find their goldfish had succumbed—or did an over-enthusiastic fishkeeper use the powder on aquatic 'pests' and try it as a new cure for white

spot? Anyway, the possibility of fish being present in the house is now acknowledged. I thought you might like to know.

MRS R. KNIGHT  
Sturston, Wilt.

### Roehampton Show

AS the number of open shows seems to be on the increase, Roehampton AS have decided to hold a show on alternate years. Therefore our next show will be in May, 1975. We would like to thank all those who have given us support, and would ask all perpetual trophy winners to return their trophies to Mr D. Lambourn, 7 Wheeler Court, Plough Road, London, SW11 2AX; phone 01-223 2630.

MRS P. LAMBOURNE  
Secretary, Roehampton AS.

## Growth of Fry

FISH breeders recognise that however much they try to alter things the fact is that young fish in a brood have quite different rates of growth. Particularly in the first few weeks of life some fry seem to streak ahead and in some species these are soon gobbling up their brethren whose progress is slower. Grading and separation of the fry at regular stages has to be practised if rearing the maximum number from the brood is the aim of the breeder.

Continued on page 50

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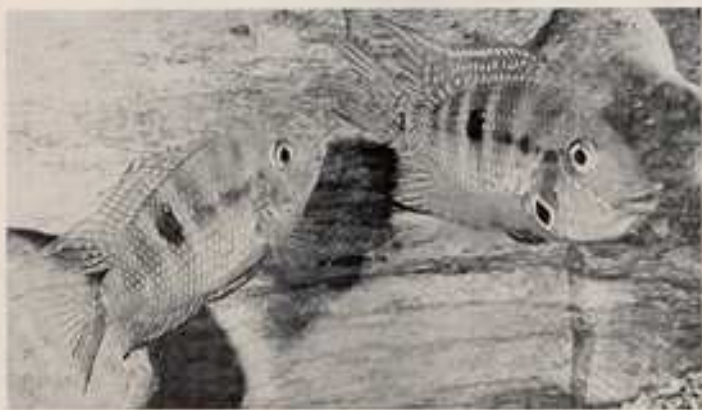
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## Breeding the **Firemouth Cichlid**



*Cichlasoma meeki*

By **RUDOLPH ZUKAL**

Photographs by the author

**T**HE German aquarist's name for this fish is, literally, the 'red-breasted' cichlid. Although it belongs to the family that includes some of our heaviest and largest aquarium specimens, it only reaches a size of about 4 in. (10 cm) in length. From its natural habitat in Guatemala it was first imported into Europe in 1939.

*Cichlasoma meeki* are generally considered to be unsociable fish, pugnacious between themselves and towards other species, but I must contradict this because it is not a statement of the facts as I found them. I kept two pairs together in a community tank that housed fish only an inch long. The small fish were never attacked; each pair of firemouths merely defended the boundaries of their own selected territory—two corners of the large tank that I had furnished with stones. The fish would swim round the tank at night and spend most of the day feeding.

There are good and evil men and it is the same with animals. Fish are no exception. Even among an acknowledgedly peaceful species such as *Xiphophorus helleri* (swordtails) there can be 'rogues' and snappy, quarrelsome individuals are found among them. So it is the same with *C. meeki*—my fish proved to be good ones—they probably had a good upbringing! They spawned in the corner of the tank and protected the young from the rapacity of other fish.

For their permanent home firemouth cichlids should be provided

Translated by F. MARSH



In this series of photographs the male firemouth is the larger fish (in this picture behind the female). The male has occupied the flowerpot and the female is attracted by his courtship display to enter this spawning 'cave'.

where possible with a large tank (a 36 in. by 12 in. by 15 in., 100 litres or more). It can be filled with ordinary tapwater provided that this has 'stood' for some time before being used. Coarse live food will keep the fish healthy. For breeding purposes a 24 in. tank is required, filled with water at a temperature of 70°F (26°C) and containing well-washed gravel and floating plants (or strong plants that have been planted in flower pots). Several flat

stones should be laid on the tank bottom.

I chose a pair for breeding that had practically 'selected' themselves by displaying their eagerness to spawn (the female should have a rounded abdomen and, what is an even more promising sign, her ovipositor should already be protruding). Preparatory to spawning, there is sometimes a wild display or courtship, which can look more like a fight and, indeed, the female is often injured in it.



Watched by the male through the bottom (broken) end of the flowerpot the female commences to deposit eggs over the curved inner surface of the pot.

Fertilisation of the eggs by the male, who has now joined the female in the flowerpot. Both parents guard the developing eggs and keep the water flowing over them by movements of their fins.



Eggs are laid on a solid surface such as provided by stones and roots; but, if the female has the chance of using a slanting surface, she will choose this in preference. Once the female has chosen the site, such as the surface of a flower pot, the eggs are laid and then immediately they are fertilised by the male.

It is usual for both firemouth parents to look after the eggs. They carefully remove infertile eggs and

wave fresh water over the good ones with the movements of their fins. While this stage continues, the parents should be fed little or nothing. The young fry hatch after 48 hours and the parents then remove them to previously prepared holes in the gravel or sand, where they continue to tend them. The young can sometimes number several hundred. When the fry become free-swimming the parents lead them through the tank.



Here the male is seen on duty with the eggs. When they hatch after about 48 hours young fry are removed by the parents to temporary nests made in the aquarium gravel.



Both parents (male, left) with their free-swimming youngsters, which they conduct around the tank. When the brood number a hundred or more this is an impressive sight to see.

At night, or if danger threatens, they are collected up again into the holes in the gravel. The parents periodically clean the young fish in their mouths. Once the yolk-sac has been digested, the young are fairly big (over  $\frac{1}{4}$  in.; 3 mm) and very hungry. Small cyclops are taken at once. At first the fry are a mottled colour; then when they have reached a size of nearly  $\frac{1}{2}$  in. (1 cm) their coloration becomes

similar to that of their parents.

The after-care exhibited by the parent fish is very striking with these cichlids, and they look after the young for a fairly long period. I have even noticed the parent fish spitting out previously chewed-up tubifex so that the young can eat the very tiny pieces. It is behaviour such as this that makes this fish of such great interest to its owner.

## Growth of Fry

*continued from page 490*

With livebearers, where the broods are smaller, rearing the fry individually in isolation is a practical possibility, but some observations made on platys (*Xiphophorus variatus*) suggest that development of the young in groups has effects on the length and coloration of the adults ultimately produced. These 'social effects' on development have been reported in NATURE by Dr R. L. Borowsky from the Department of Biology of the New York University. His work showed that in groups of immature male platys the individuals with the greatest rates of growth reached sexual maturity and maximum length first but were in fact overtaken in length by the other males with slower rates of growth and a

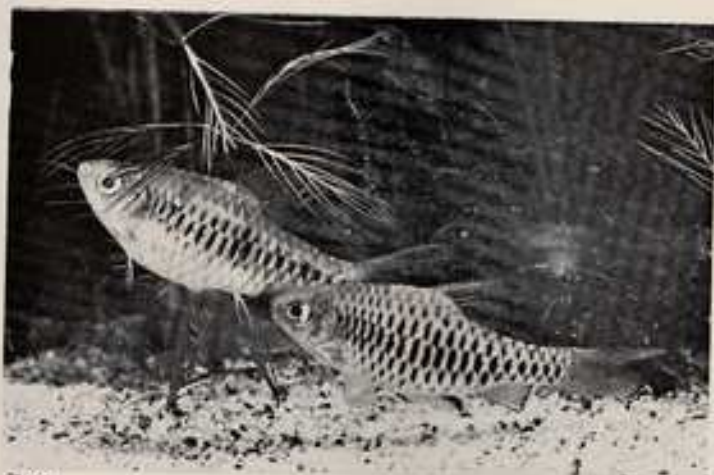
later age of maturity. Thus, in the group, the fry that were smallest initially ultimately made the largest adult males. Maturity in these fish was assessed as the point at which full anatomical differentiation of the anal fin into the gonopodium had taken place, and as in other livebearers no further growth of the fish takes place after this event.

Distribution of yellow or red pigmentation in dorsal and caudal fins of the male platys was also affected by 'social' factors, Dr Borowsky has reported. The colour developed only in the largest male of the group as the fish matured but did not increase in that fish once that mature male was overtaken in size by another male reaching maturity, which meant that the males that held the position of being the largest fish in the group for the longest times became the most vividly coloured.

Breeders of this species should be aware of these 'social effects' in groups of males when selecting breeding stock if they are developing strains by size or colour. It will be of interest also to see whether other species are prone to the same or comparable effects when reared in groups.

## A Critical Look at Recommended

# Spawning Procedures



Photo

RUDOLPH ZUKAL

Pair of chequer barbs (*Barbus oligolepis*). The male is on the right

AMONGST fanciers there seems to be a tacit understanding that breeding egglayers is far more difficult than breeding livebearers. To some extent this can be borne out by the number of people keeping egglayers who fail to breed them, but I wonder how many people know how often some of their egglayers spawn in their community tanks, unobserved and the eggs or fry have been eaten? Granted, some of the egglayers are at present almost impossible to breed in normal sized aquariums under our usual conditions, but this does not apply to a great number of the varieties kept. It is, however, necessary to get the conditions right.

All fishes will breed if the correct conditions are supplied to them—in some varieties it is not possible to imitate their natural conditions, but this can be approximated for many others with success, particularly amongst the smaller kinds. Perhaps the easiest to breed are some of the cichlids, which very obligingly will rear their progeny for you, but a little more care in rearing is necessary for the egg-scattering fishes. One of the main difficulties is that the fry are much smaller than

---

their counterparts amongst the livebearers and, consequently, more care in feeding is needed.

It often seems that we aquarists make things as difficult as possible, and one of the fetishes at present in vogue is that very small fry cannot be reared without Infusoria being given. Keeping a variety of worms and other messy cultures never adds to the enjoyment of fishkeeping, and adding cultures of Infusoria lacks a certain amount of appeal, so I decided to proceed without them, and to try to succeed, using a proprietary fry food only (Liquifry). Having a supply of 'green' (livebearer) Liquifry I used this, and have never bothered about the type labelled 'egglayers'.

Amongst all the advice on breeding given in books is the frequent admonition to put together a suitable pair in a specially sterilised tank, when they should spawn in the morning etc. (I wonder

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By F. W. COLES

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who sterilises the rivers for them under natural conditions?) This again, I think, is making things more difficult, because so many of the smaller kinds of fishes are shoal spawners, and do not take kindly to being segregated in pairs, monogamy not being one of their strong points.

Granted that the more fish there are present, the more there are to eat the eggs and fry, but usually, if the fish are well fed they will let the eggs hatch naturally, and the fry live, as they do in Nature. The closer confinement of an aquarium does increase the risks, but good feeding can overcome this to a large extent. It is the fish denied live food that turn to egg-eating and fry-catching usually.

Another instruction given concerns planting the aquarium to be used for breeding. Plants and gravel in breeding tanks can be a nuisance, the one becoming uprooted, dying etc., and the other concealing the amount of mulm on the bottom of the tank. Floating plants can be a real asset and can cover the whole of the water if available. Lighting is another thing to be considered, and of the two

alternatives, daylight is much the more natural and, indeed, effective, both for the fish and the surface plants.

Having all these things in mind, I purchased six chequer barbs, the species to be tried, and whilst they were getting used to the local water in a tank with platys, another tank was set up for them in a wooden outhouse.

This was a 24 in. by 12 in. by 12 in. normal angle-iron aquarium, and it was placed with the top level with the bottom of the window glass (facing west), where it receives the afternoon sun (if any). It was lagged on all four sides with 12 in. ceiling tiles, three thick, so no light reached the tank other than from the top. A 4 in. inspection panel was cut in the front and the three 4 in. squares were cemented together to form a plug which could be removed for inspection and replaced when not needed for that purpose. The water, which was taken from the tap and left for 2 weeks to get rid of the chlorine, was covered with water lettuce, and some plastic plants were placed at one end to provide both shelter and a spawning



# An

Photographs  
by  
R. ZUKAL

Pair of *Aplocheilichthys lineatus* (male above, without vertical bars)

**T**HERE is at the present time an ever-increasing interest in the keeping and breeding of killifishes. Many people are first introduced to these from the rather limited selection of them that appears in dealers' tanks from time to time. One of my favourites is *Aplocheilichthys lineatus*. Although by no means a rare fish, it is what must be called uncommon as few people seem to keep it. For the newcomer to killifishes it is just one of a large

number of fishes which are highly suitable for him to breed. It is a hardy fish and is both prolific and very attractive.

The male will grow to about 3½ in. and the females to 3 in. Sexing the fish is easy when they are in good condition. The male has no vertical bars, whereas the female has seven, and a small dot at the end of the dorsal fin. The ventral fin of the male is tinted with orange. The males also have more

medium.

The six barbs were then introduced, and after a day or so of standing on their noses to show their dissatisfaction, disdain or whatever, they settled down to a normal existence. The tap water is soft and about neutral. The pH does not seem important to the fish, but soft water does seem to be necessary for them. Setting up this tank coincided with a stretch of warm weather and the tank temperature was in the low eighties (°F) for days on end without the thermostat ever coming on, unless at night.

They were watched very carefully but no signs of spawning were apparent, this being perhaps because they got up rather earlier than I do, daylight coming rather early in the summer months.

However, one morning it was noticed that numerous small fry were free swimming and they were immediately treated to a feed of Liquifry. As, however, the parents had been in the tank for a few weeks, no doubt there was *Infusoria* also present to a certain extent. The fry were completely

unmolested by the parents and appeared to be feeding satisfactorily. During the whole time they were being reared I never noticed any dead ones, and growth was steady and normal.

During the whole time of rearing, tubifex was purchased weekly and was supplemented by home-produced whiteworms. Worms were given mashed, and so live food was always available for both the fry and their parents.

Since then the parents have spawned twice more, and no doubt will do so again. The original youngsters are now transferred to a tank of their own and are progressing well. These spawnings would seem to show that a combination of soft water, fairly high temperature, and natural daylight form the kind of conditions which more nearly approximate their natural ones and so induce them to breed.

Previously, placing pairs in freshly set up tanks, with artificial light, has always proved abortive, and I have no doubt that these described conditions would suit many more of the smaller shoaling fishes, and induce them to rear youngsters successfully.

## Easy Killie

By P. K. BROWN

pointed dorsal and anal fins; the female's fin is more rounded. A precise description of the coloration is difficult to give as the hues can change depending on the angle from which the fish is viewed.

I prefer to keep my fish in a 24 in. by 12 in. by 12 in. tank, filled to a depth of 9-10 in. One essential with these fish is a well-fitting lid, as they are great jumpers capable of going through the smallest hole. A 24 in. tank gives the fish plenty of room to breed and also gives the fry a chance to escape from their parents, which are to a certain extent cannibalistic. The tanks are furnished on the bottom with a thin layer of boiled and well-washed peat. This serves to keep the water slightly acid and also to show off the colour of the fish. Too light a bottom will give a pale and rather frightened fish.

What else goes into the tank will depend on whether one wants to collect the eggs or leave the fry to grow up with their parents. I prefer to let the fry grow up with their parents because this method allows only the healthiest fry to survive, as any weaklings are eaten by both fry and the parents. When the eggs are raised separately there is not this natural check.



Pair of *Aplocheilichthys lineatus* spawning in moss on the aquarium gravel

When raising the fry with their parents sphagnum moss makes an ideal spawning medium for the fish. This moss is obtainable from florists, who use it as a foundation for wreaths and crosses. Fry and obtain it as green as possible as then it will live and grow in the tank. Also a fine floating plant, such as *Nitella*, is very useful for acting as a hide

for the young fish. A nylon spawning mop is also useful as it means that some eggs can be collected for giving away to friends.

*A. lineatus* are greedy eaters and must be well fed to be kept in the best condition; they do well on glassworm, daphnia, tubifex, and the frozen mysis shrimp. When feeding with tubifex one must be careful that too much is not given otherwise the excess worms may well die and foul the peat in the tank. So long as the fish are well fed there is no reason why they should not produce 8-12 eggs a day for some months. The fish only need to be reconditioned if one is getting battered.

For breeding a temperature of 76°F (24°C) would seem to be ideal; the addition of 2 table-spoons of salt per 24 in. tank is beneficial, as it will act as a preventive against velvet disease. The eggs are laid singly and will be deposited all over the tank. If it is wished to collect any eggs this can be done from the moss. The eggs are fairly tough and the best way of dealing with them is to place them in a small margarine container, which has been well washed, with some water from the tank

from which the eggs were taken. A fungicide is not normally required.

The eggs will hatch in 10-14 days, depending upon water temperature. Once the fry are first seen in the tank, I then start feeding with brine shrimp and micro worm. At this stage one can also remove the parents from the tank, and rear the fry on their own, thus leaving about a month's supply of eggs in the tank. After a couple of weeks the fry should be gradually introduced to dried food, otherwise if the change is left for too long some difficulty will be experienced in making this change. When the fry are about 1/4 in. long they can be removed to another tank to finish their growing on. If large fry are left with their parents, the larger fry will start to eat any other fry that appear.

In all, *Aplocheilichthys lineatus* is a most attractive and obliging killie for anyone interested in breeding fishes of this group. Further information regarding killies can be obtained from the Membership Secretary of the British Killifish Association, Rushen, Elm Grove, Eccleston Park, Prescot, Lancs.

## An Arum for the Aquarium

By K. RATAJ

Photographs by R. ZUKAL



*Spathiphyllum wallisi*. A cluster of young plants is forming from the rhizome of this specimen.

PLANTS of the genus *Spathiphyllum*, belonging to the arum family (Araceae), are found chiefly in South and Central America, some also occurring in south-east Asia, and there are about 36 species. Many of the species are popular in the U.K. as ornamental indoor or greenhouse plants. Although quite a few of these plants grow in moist places, only one species, *Spathiphyllum wallisi*, has been shown to grow successfully under water.

This species comes from Columbia and Venezuela. In Nature it grows as a perennial marsh plant, up to 50 cm high, usually shorter, however, and only about 30 cm if cultivated under water. It grows from a rhizome up to 4 cm thick, from which arise petiolate leaves each with a long lanceolate blade. The petiole (stalk) is usually longer than the leaf blade, which is brightly green, 3 to 6 cm wide, with moderately undulate margins, ornamented by moderately elevated veins.

The floral stalk is up to 50 cm tall, and the

inflorescence is covered in a cream-white spathe.

In aquaria *Spathiphyllum wallisi* can be cultivated similarly to the cryptocorynes, but unlike these plants it is not sensitive to excess of light and is tolerant of lower water temperatures. Although under submerged conditions the plant can survive for several years it grows extremely slowly and may form only a single new leaf in a year. Only rarely does this plant develop root runners under water. It is necessary therefore to use plants cultivated out of water for propagation. They do well in flower pots, treated like other species cultivated commonly in greenhouses, and from a piece cut off the rhizome 10 to 15 young plants are obtained.



Inflorescence of *Spathiphyllum wallisi*

## Readers' Queries Answered



### Development of Hoods

*I bought some brambleheads at the end of the summer and was assured that the hoods would develop 'by next year'. There is no sign of this yet, and I am wondering whether these fish are going to develop hoods at all.*

The time taken for the hood to develop does vary. Dr Y. Matsui in his book *GOLDFISH GUIDE* states that generally the hood should first be visible to the naked eye at the end of a month (120 days), but this would be seen under very close scrutiny. Its development is controlled by water temperature, diet, general health of the fish and particularly, it has been suggested, by the presence or otherwise of algae in the water. Finally, as you imply, some fish never do acquire their hood. If it is going to develop it should be appearing by the end of its first year, and it may well take another 2 or even 3 years before it is completely formed. The entire hood should stretch back to the gill plates and cover them.

### Festive Cichlids

*My two newly bought festive cichlids are taking a long time to settle down. They are about 2 in. long and very nervous, although I have them in a tank with a community of only medium sized fishes such as black scolorax and swordtails. The other fishes don't seem to be attacking them at all.*

Although members of the cichlid family, festive cichlids are not only peaceful fish that can be kept safely with fishes smaller than themselves, but they are really inclined to be timid, at least when small and transferred to new quarters. Even when adult they will never appreciate very boisterous tank companions. But if they have plenty of plant coverage they will gradually settle in. They should be fed with small live food, white worms, tubifex and daphnia, though at their present size they are probably eating a fair amount of dried food. They are going to grow to somewhere near

6 in. in length so they should be housed on a permanent basis in a fairly large (at least 30 in. in length), well planted, clean and well aerated tank with the temperature kept in the 78°F region.

### Spiny Eels

*What should I feed spiny eels on? They seem to have very small mouths and are not eating the dried food, which is all I can offer them.*

These fish are ideally constructed for rooting about for tiny live worms and this is the food they will most appreciate. Tubifex worms, white worms and, in the summer, bloodworms are ideal foods, and they will also take daphnia. If you are unable to purchase tubifex, or if you do not approve of its use, then it is necessary, and quite simple, to start a white worm culture that will supply suitable food for your fish throughout the year.

### Water Gardener

*As a newcomer to the hobby and a keen gardener anyway I can't believe that I can get a good plant growth using just the coarse gravel as a base for the tank. In fact, my plants aren't doing very well and I am thinking of resetting the tank with a mixture of clay and peat underneath the gravel. I can see problems arising from this but it irks me not to be able to grow water plants as well as plants in the garden.*

It is true that it is most unusual

to find as a substrate for plants in their natural habitat just the uncompacted gravel that is used in aquarium tanks. In the wild, plants will be found growing in rich clay, loam or humus. But then, in Nature, many of our aquarium plants grow largely emersed or at least are totally inundated for only part of the year. So that conditions in the aquarium tank are far from natural anyway for the majority of the plants grown in it. And it is perfectly possible to obtain a very adequate plant growth in a tank without the use of an underlayer of clay.

The decision to use or not use a heavy substrate in the aquarium must be influenced by one's basic interest in the tank. As a keen gardener it may well be that your main interest will become concentrated on the plant side and you will strive for a planted tank to rival those magnificently planted Dutch tanks described for us by our contributor, Mr. W. Tinsley. Many Dutch aquarists cover their tank with a layer of unwashed gravel, a layer of mixed peat and clay, covered with a deep layer of washed gravel. A vast amount of lighting is used and time must be found to prune the plants regularly to prevent excessive growth. Some care must also be exercised in the choice of fish—bottom-grubbers, plant nibblers or plant-movers must be excluded from such a set-up.

It is likely that a part of your poor plant growth problem is due to the fact that your tank is not yet well established (you state that you are a newcomer to the hobby) and it may be underpopulated with fish so that the nutriment available to the plants is rather on the thin side. It may also be that the plants are simply not getting enough light. It is, of course, quite possible to give extra nutriment to a particular specimen by planting it in a small flower pot filled with clay, peat and a top layer of gravel. If you should decide to go ahead with a clay subsoil mixed with peat and a small amount of charcoal (although we think that the advantage of this will be slight), a  $\frac{1}{2}$  in.-1 in. layer of this must be covered by a good layer, some 3 in. deep, of gravel. The tank must also be tested for pollution before the main body of fishes is added—by ensuring that two or three guppies will keep healthy in it for 2 weeks or so.

## AquaGLOSSARY

No. 15

A PFM guide to the meanings and accepted pronunciation of the scientific names of aquarium subjects, arranged by word-roots in alphabetical order

**Fluvi** (Latin): river, stream. Pronounced 'flu-vee'. In the trivial parts of the scientific names of the puffer fish *Tetraodon lineatus* ('tet-rah-oh-don flu-vee-ati-liss') and of the freshwater crayfish (*Astacus fluviatilis*) the root is indicative of habitat.

**Mono** (Greek): single. Pronounced 'mon-oh'. Often used as a prefix to a name denoting a single conspicuous feature of a genus, as in the marine fishes *Monacanthus* ('mon-ah-kanth-uss') and *Monocentrus* ('mon-oh-sent(kent)-russ'), which have single strong dorsal spines (*acantho*, Greek: spiny) (*astro*, Greek: point, prickle). Also the leaf fish, *Monocirrhus polyacanthus* ('mon-oh-



The leaf fish (*Monocirrhus polyacanthus*) has a single lip barbel

Photo  
MARCUSE

*viriss* polly-ah-kanth-uss'), having a single lip barbel ('whisker') (*cirro*, Latin: hair curl), the 'finger fishes' *Monodactylus* ('mon-oh-dak-till-uss'), having one 'finger'—the stumpy dorsal and anal fins (*dactylo*, Greek: finger) and the apparently single-finned eel (*Monopterus* ('mon-op-terr-uss').

**Sphaer** (Greek): ball, sphere. Pronounced 'sphere'. For example, the generic name *Sphaerichthys* ('sphere-ik-thiss') means literally 'spherical fish'.

## COLDWATER SCENE



By FRANK W. ORME

**D**AYLIGHT hours are becoming lengthier, as spring approaches, and our goldfish are showing signs of increased activity. Feeds of small amounts of chopped earthworm, or other live foods, can be offered as the water warms up, and the fish will soon be eating readily.

If it is your intention to breed the fish this year, now would be a good time to separate the sexes and prepare the spawning quarters, which should preferably have 36 inches by 12 inches minimum surface area. The separation of the males and females, after their winter rest, encourages the fish to give a vigorous spawning with an increased percentage of fertile eggs. With adequate feeding of meaty foods the fish will quite soon be exhibiting those signs of good health and first-class condition: bright eyes and shining scales with fins erect. The sexual characteristics of the males will become evident; small white tubercles appearing upon the front rays of the pectoral fins and gill plates will show the fish to be in breeding condition. The females will become plump with ova.

When the water in the tanks reaches a temperature of 60°F (16°C) thought can be given to placing the selected parents together. Wait for a settled spell of mild weather to set in during early March, which is early enough to begin your breeding programme, and then set up the spawning tank with bunches of fine-leaved plants or nylon wool mops at both ends to catch the eggs. Make sure that any plants which are used have been well cleaned and be absolutely certain that all snails and/or their eggs are removed; failure to observe this precaution could mean that many of the fish eggs will be eaten by the snails.

When you have decided that the right time has arrived, and the fish are alert and in good breeding condition, the chosen male can be placed into the prepared quarters and allowed to settle down for 24 hours. The following evening the female can also be gently placed into the tank. If the male swims straight to her and after a while commences to quietly push and nudge at her as he follows her around, then, in all probability, you may be lucky enough to find that the following morning the spawning will be in full swing.

Around mid-day an inspection should reveal many eggs, each about the size of a pin head,

## Preparations for the Breeding Season Ahead

adhering to the spawning medium, base and sides of the tank. The fish must now be removed to prevent them eating the eggs, which they will do if they are left in the tank. Install a heater and thermostat and slowly raise the temperature to 70°F (21°C); this will ensure that the eggs hatch in around 4 days.

If you have not been successful in obtaining a spawning after 3 or 4 days, separate the fish and try again after a further week of feeding them with earthworms and daphnia. However, assuming that everything has gone according to plan so far, it is essential that you ensure that you have a plentiful supply of small food available, with which to feed the tiny fish when they become free-swimming. Brine shrimp eggs can be placed, according to the supplier's instructions, in containers to hatch. The newly hatched brine shrimp can then be strained on a fine material, such as an old well-washed handkerchief, and then swilled into the tank of baby fish. Goldfish fry can, in fact, be maintained upon this food until they reach a size of almost half an inch.

Before the spawn hatches it will be seen that a great many of the eggs will become white and develop fungus; these will be the dead and infertile eggs, but do not worry, for the fungus will not attack any of the eggs which are fertile. After a time it will be possible to see the minute alevin, within the egg, making sudden and vigorous twisting movements, which is a sure sign that they will soon be hatching out.

Quite possibly on inspection of the tank the day after noticing the movement of the alevins, tiny glass-like splinters will be seen hanging from the glass sides of the aquarium; be very careful not to disturb them for these are the young fish. Look closely and you will be able to see the air-sac, a rudimentary backbone and even a minute heart beating. Before long they will commence, in short spasmodic bursts of energy, their journey to the water surface, where they take in a small amount of air to 'inflate' the swim bladder. Owing to the water pressure this demands great effort and any fish that has the misfortune to sink to the bottom may have some difficulty in again struggling to the surface. Indeed some fry will fail to fill the swim bladder and are doomed not to survive. For this

reason spawning and hatching tanks should have no greater depth than 12 inches, and many breeders suggest the ideal depth should be a maximum of 9 inches.

The day after the swim bladders have been 'inflated' the alevins have recovered sufficient strength to swim freely. They have used up the food which was contained in their yolk-sac, and they will be actively hunting for the microscopic food, which forms a newly hatched fish's diet. It is at this stage that the brine shrimp naupli can be fed to the young. If the shrimps are available in sufficient quantity the little bellies of the fry will be filled to bursting point, and will take on the red coloration of the shrimp; such feeding will lead to quite a rapid growth. It is quite possible to have, after 7 to 10 days, a tank of young fish of up to half an inch in length.

\* \* \*

During the following months I shall be giving further suggestions for the novice. Each article will be written to cover the action that should be taken in the month after the publication of *PFM*. This will give the beginner sufficient notice to prepare for any action which should be taken at that time. By following the advice given perhaps a few of the difficulties that the would-be breeder encounters can be avoided.

To the person who is keen to take up the hobby of keeping goldfish—whether common or fancy—I offer the following advice, which applies equally to any other branch of the fishkeeping hobby. Do not be too ambitious at first; learn to exercise patience and progress slowly, but surely, as you gain experience.

The wise will make certain that they can provide the right conditions in which to maintain their fish with the best possible chance of success. Purchase the largest tank you can afford, certainly no smaller than 24 in. by 15 in. wide and 12 in. deep; a 36 in. tank would be preferable. Having obtained the aquarium, set it up, in position, and allow at least a week for everything to settle down. I would suggest that the first inhabitants are either common goldfish or Bristol shubunkins. Any losses are likely to be less expensive than would be the case with the more fancy varieties. Obtain the fish from a reliable healthy source, avoiding any fish that does not appear alert and active, and do not waste money by over-stocking. A good method of calculating the number of fish a tank will safely accommodate is to allow 24 square inches of surface area to each inch of fish.

Read all the available literature on the subject of coldwater fish. Do not be afraid to question more experienced fishkeepers. Learn all you can and then apply it. In this way you will gain the necessary knowledge that leads to success. As your experi-

ence broadens, and when you have learnt to maintain your fish in good health, then you can advance to the fancier varieties.

Before embarking upon the purchase of your first fancy goldfish learn the points to look for; there is no point in buying rubbish! If possible obtain young fish from a breeder around July or August, but do not expect to buy his best fish—he would not sell them anyway! If half a dozen youngsters of the chosen variety are taken home it is reasonably certain that you will have a pair amongst them. It is at this point that you should be prepared to pay for the best specimens that you can afford. Good stock is the basis upon which you will build any future breeding programme and from which you will pick your future show fish. Remember you will not be considered a real aquarist or goldfish fancier until you breed your own fish.

\* \* \*

From what I believe to be a very reliable source I have heard that the Midland Show held at Bingley Hall, Birmingham, may soon be a thing of the past. The Midland Aquarium and Pool Society, who are responsible for arranging and staging this fine exhibition, are having very great difficulty in finding the finance required. This exhibition is one of the top aquatic events and has been staged each year for the past 30 years without a break, attracting the top breeders and exhibitors in the country to its show benches. It is also one of the very few shows to stage comprehensive coldwater classes for both adult and young fish.

What a great pity it would be if this show were to disappear from the Midland scene, and what a great gap it would leave. The Midland Aquarium and Pool Society must be admired and applauded for keeping the show 'on the road' for as long and successfully as they have done.

\* \* \*

Last month I wrote in *PFM* about the confusion existing within our hobby due to the various show standards that are in use at the present time. Ours is the only fancy that is in the deplorable and ridiculous position of not having a single set of National Show Standards for fancy goldfish. It is a situation that should be put right without further delay.

The position of the various committees who have spent considerable time in drawing up and agreeing a set of standards, together with the cost of having them produced in print, is fully realised. They have a sense of pride and satisfaction in a job well done, and would be loath to see their work destroyed; they are, after all, convinced that the standards they have produced are far superior to any other and would not give them up without strongly opposing any such suggestion.





If delegates to any convention, arranged for the purpose of agreeing upon National Standards, attend the conference with this understandable resistance then nothing worthwhile will be settled. All those who may attend any future meetings must do so in an attitude of flexibility; like all good diplomats they must be prepared to discuss the problem and compromise in order to reach agreement.

A month has passed, in which I hope that some serious thought has been given to the problem of standardising the Goldfish Standards by all enthusiasts, both novices and old hands, but more particularly by those who are in a position to bring some sense and reason to the matter of agreeing that it is both desirable and essential that there should be only one set of standards against which fancy goldfish are judged—National Standards.

To be constructive I offer the following suggestion: request that the editors of the aquatic press

conduct a unified opinion poll, publishing the outlines of the various standards and placing those for each single variety alongside each other for comparison, without revealing whose standards they are. Each could carry an identification letter, goldfish keepers then being invited to vote for one only of each of the outlines. The outlines which received the greatest number of votes should then be accepted as the National Standard, having been placed there in a democratic fashion by public opinion.

It only requires the agreement of all interested parties, and of course the magazine editors, for the problem of National Standards to be settled to the satisfaction of the majority with no 'loss of face' for the minority. What about it FBAS, GSGB, Bristol and Midlands groups, and all your other interested parties—surely it is worth trying? With sufficient goodwill, 1974 could become the year of common-sense and unity in our particular sphere, if not in others.

## Amateur Aquarist 130 Years Ago

RONALD WEBBER presents some observations of a lady goldfish keeper of the nineteenth century

**G**OLD and silver fish are very ornamental and suitable objects to keep in a lady's morning room. It is generally supposed that they are quite incapable of affection; but some that we have certainly knew me again when I came back after having been out of town; and one, which I call Goldy, and which we have had four or five years, will come and nibble my finger when I put it into the water.

I take care of these fish myself, and keep them in a glass bowl during the day, and in an earthen pan at night. I do this that I may be sure their water is changed twice in the twenty-four hours; as, when I am indisposed, or very much occupied, I might perchance forget them at night, were I not reminded of their wants by seeing them still in their glass globe. I never suffer any food to be given to my fish, save what they find in the water. Bread is decidedly bad for them; and one that I was very fond of was killed by my maid Susan giving it flies. I always take care that my fish have never or pond water, as spring water is too cold for them, and often

contains some mineral which would be injurious; and I keep them in a room with a fire during the winter, through they appear injured by too much heat.

The above was written by Jane Loudon in one of her books *THE LADY'S COUNTRY COMPANION, OR, HOW TO ENJOY A COUNTRY LIFE RATIONALLY* published in 1845. Jane was the wife of a famous horticultural journalist and author and after his death Jane carried on the writing of many books for women such as *GARDENING FOR LADIES* etc. In her *COUNTRY COMPANION* she goes on:

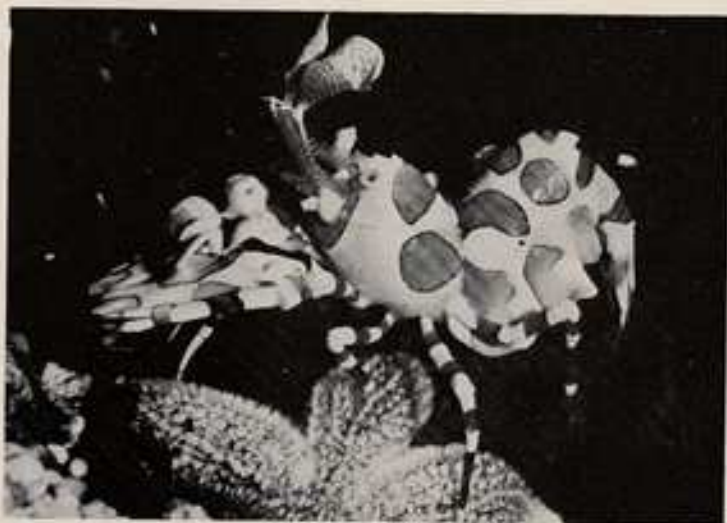
'However, notwithstanding all the care I take of my fish, I have lost a great many, particularly since I have kept them during the day in a glass globe. Formerly, when I kept my fish in a china vase of oblong shape during the day and in an earthen pan at night, they were remarkably healthy, and I only lost one in five years; but within the last six months that I have had a glass globe I have lost four. It is true that the year 1845 appears to have been very unfavourable for gold fish, as a

great many have died, even in ponds where they are generally much more healthy than when kept in rooms.

"In one instance, also, I have been informed that nearly twenty have died in the marble basin of a fountain, where fish had been kept for years with an average of not more than two or three deaths in a year. I cannot at all account for the death of my fish, who were all attacked in the same manner; swimming on one side, but bent so as to form an almost right angle in the water, and generally dying a few hours after the first attack. In many cases, however, the cause is evidently a plant nearly allied to the green scum formed on stagnant water. This plant which is called *Achyla prolifera*, consists principally of threads so exceedingly fine as to be imperceptible to the naked eye, and probably arises from the water continuing too long unchanged. When it has continued some time, it appears like little tufts of cotton wool on the gills and tail. No remedy appears to have been discovered; but keeping the fish in rain water is said to prevent the appearance of the plant.'

## TROPICAL MARINE INVERTEBRATE

## Attractive and Interesting 'Shrimp'

Harlequin 'shrimp' (*Hymenocera picta*) with its prey, the starfish

NEXT to my interest in seahorses I have a great interest in the so-called 'lower animals', of which different kinds can be kept together with seahorses without any trouble. Animals like prawns, shrimps and other crustaceans such as small hermit crabs, and snails, sea anemones and the beautiful tube-worms such as *Sporoglyphis* and *Sabella*, are the ones of principal interest to me.

On one of my collecting trips I discovered at the importers Eurofish in Rotterdam some very remarkable animals which reminded me of rubber toys for children in their colour and form. Their basic colour is bright rose and the ground colour is adorned with sharply defined irregular circles and spots of darker hue; they walk on thin, alternately banded white and blue legs. On further consideration, they appeared to me to be a sort of shrimp, with a strange shape, pretty colours and enormously broad pincers. I hardly assumed that these small (about 1 in. long) and fragile animals would be able to pull a starfish of considerable size to pieces! Against the dark back glass of my home-made all-glass sea-aquarium, upon which red and green algae are growing here and there, I thought

By W. A. TOMEY

Photographs by  
the author

these animals could make a beautiful colour effect.

It is very important, particularly before buying, to consider whether the existing population of the tank will be disturbed by new additions. In view of the low population in my tank and the fact that a good algae development was present, with *Caulerpa prolifera* growing richly, I assumed that the circumstances were biologically not unfavourable and decided to take the risk. In this way a pair of harlequin shrimps (*Hymenocera picta*) came into my tropical marine aquarium.

*Hymenocera picta* has an enormous distribution in the sea, stretching from the Red Sea to East Africa, from Polynesia to the Indian Ocean, but they are considered rather rare animals and we know very little about them at present. We might

assume that they were from tropical reefs by their colour and form. Among the variegated colours of coral formations and brightly coloured reefs, and in the moving play of light and shadow caused by the breaking up of the light as it passes through the waves, these harlequin shrimps are almost invisible against the coral reef; and this excellent camouflage is due not least to the special shape of their body and the outline-breaking colour of their skin.

The name *Hymenocera picta* relates to their form and design: *hymen* (Greek)—thin skin or membrane, *oera* (Greek)—to grow; *picta* (Greek)—pictured or spotted. Most remarkable are the very broad but thin pincers and the membranous protuberances above the rostrum on the head, which are continuously in movement and can even be directed downwards. It may be that these prettily designed protuberances are sensory instruments. The numerous appendages, such as walking legs, swimming legs, jaw-legs, filaments and protuberances of crustaceans are confusing to the observer, and in this the harlequin shrimp is no exception! The body consists of a head/chest region (cephalothorax) and the after-part (abdomen) made of segments terminated by the telson. We can distinguish feelers, composite eyes, jaws, filaments, jaw-legs, walking legs, swimming legs etc., which all have their particular function and may contain sensitive organs.

When the shrimp is walking, the rear part of the body balances here and there as if it were connected to the breast part only by a rubber band, which enhances the impression of a child's rubber toy. A pair of extremely thin and almost invisible feelers reach the tail and are in continuous movement. The pincers are razor sharp and provided with broad, thin skin membranes which can be so well developed on adult animals that a part of the prey can be kept concealed under them. The shrimps are really imposing when they threaten each other, or a seahorse as it swims by, with their fluttering pincers.

Gills are situated in the respiratory cavity under the carapace. Unlike fishes, in which water is brought to the gill cavity through the mouth and then streams from the front to the back, in the shrimp the water comes under the shell from the back into the cavity where it passes over the gills and is expelled on the foreside of the head by a continuously propelling filament. Well-oxygenated water in continuous movement is a requirement for keeping the lower animals and also for our harlequin shrimp. Partial water changes must be made and shock from temperature and salinity variations and other circumstances are to be avoided.

The remarkable shell changes of many crustaceans are well known; the animals discard their 'old clothes' in order to replace them by new ones

that have been formed under the old. It is thus not exceptional to find an empty shell or cast in the aquarium that is almost entire. Only the opening in the cast between the cephalothorax and the abdomen reveals how this complicated process is performed. However, at first I didn't find any complete cast of *Hymenocera picta* in the tank but only extremely thin and entirely transparent 'scales'. I found an old 'coat' later on that seemed to be whole. I don't know whether the phenomenon of 'scale'-shedding is to be considered normal for *Hymenocera picta*, but the transport of these animals, their capture, and the inadequate composition of the sea water and the lack of natural milieu are perhaps the cause of the phenomenon.

I was absolutely in the dark about their feeding requirements, particularly because only very little information has been published on these attractive reef inhabitants. I tried them with fresh mussel flesh, pieces of fish flesh, fish eggs, shrimps and pieces of seaweed but all were refused. Then I found a short article in a German publication in which it was stated that these shrimps would feed on starfishes. So first I went to the beach, where no starfishes were to be seen by high water; then a friend brought me three animals the day after and so my problem was solved. As I was not absolutely sure that the starfish was still alive, I gave an arm to each of the starving shrimps, and I saw with surprise that these bits were eagerly accepted and the shrimps became stronger again. Their behaviour may have been influenced by the starvation period, because later I never saw a starfish immediately pulled to pieces. From the observations I have made with *Hymenocera picta* in the aquarium, it would appear that the animals are completely unconcerned by, say, 2 weeks' fast, and we can assume that they don't find a meal every day in Nature!

A few days later I received some small live starfishes (*Asterias rubens*), which were put into the aquarium after a somewhat brief acclimatisation. One of the starfishes moved towards the male *Hymenocera*, which began to stir its 'razor-blades' at the approach of the starfish, keeping its small but sharp pincers clearly open. The starfish crept slowly to a stone that was lightly covered with algae; the shrimp jumped upon its back and pushed its sharp pincers hard into the starfish's strong skin. The shrimp then tried to cut off an arm of the starfish with its jaw-legs. It rapidly succeeded in this and the starfish turned under-surface up, lying on its back. What then happened was hidden from me by the waving pincers but I glimpsed several times the 'daggers' of the jaw-legs penetrating the star's flesh strongly and deeply, almost into the middle of it. Shortly afterwards the arms of the starfish bent and movement was hampered.



But the back of each limb of the five-armed animal was not to escape this treatment; the starfish was no longer able to escape, although its many adhesive 'feet' still moved quite well. The question is whether the muscles or nerves of the starfish are put out of function temporarily as it remains alive and is only paralysed in its movements. I also don't know whether the bending of the arms is an habitual way of defence of *Asterias rubens*; it can persist all day long. It is also a most curious fact that as long as the shrimp remains near the starfish the latter does not move, but as soon as *Hymenocera picta* withdraws the starfish opens its arms and swims away.

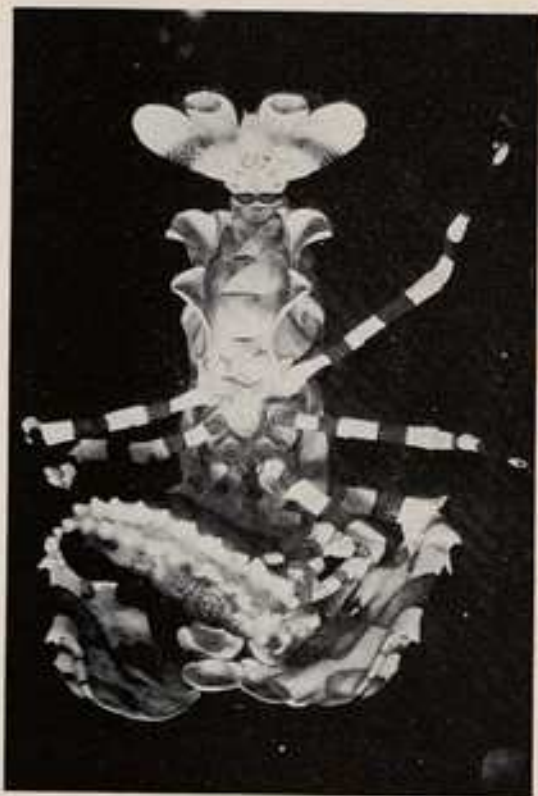
As these harlequin shrimps live mostly in pairs, live prey is not only shared but also commonly defended by being kept concealed beneath the skin of the pincers. It is also remarkable to see how *Hymenocera* shrimps are able to carry starfishes several times bigger and heavier than themselves.

In the two top photographs *Hymenocera* is seen carrying an immobilised starfish (left) and cutting off an arm (right). Left: the living amputated arm of the starfish shows movement of the tube 'feet'.

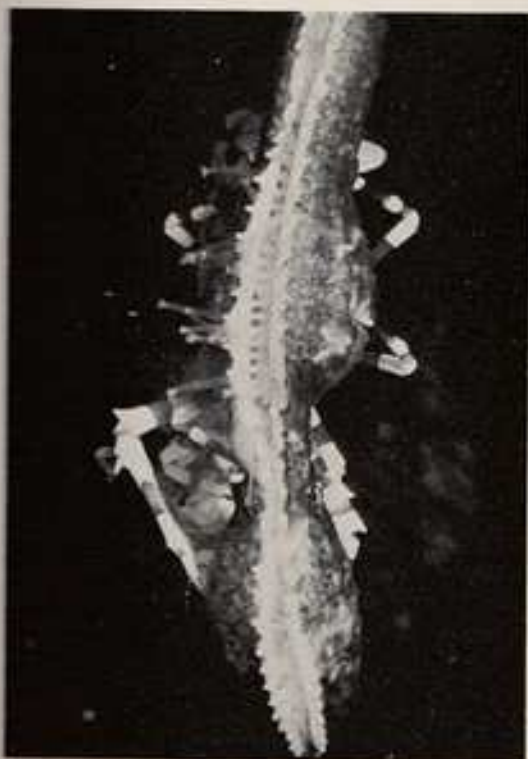
over stones or a back wall featuring in an aquarium. Sometimes the live starfish's arm is cut off by means of the sharp thin pincers and then eaten. Our harlequin shrimps thus enjoy the benefits of the fabulous regenerating power of the starfishes, as an amputated arm does not die but remains alive. So the shrimps always have fresh live food at their disposal. If a starfish does die under the treatment inflicted by the harlequin shrimps, the latter immediately abandon it and look for another one.

An important advantage of this in the aquarium is that the sea water, very prone to pollution from dead organisms in the limited volume of the tank, is not polluted as the starfish remains alive. However, it may be useful to repeat here that the normal provisions, such as strong oxygenation, water circulation and good filtration, are still necessary.

It seems that these magnificent shrimps do not have any preference for a particular starfish species and are quite satisfied with the common starfishes of European coasts. As these starfishes can be found in great numbers on our shores in summer and winter, the feeding of the shrimps is no problem. To keep the shrimps a little stock of small starfishes should be collected and placed in your tropical marine aquarium. The starfishes of our coasts are sensitive to higher temperatures and



Undersurface of *Hymenocera*, seen feeding on a piece of starfish (tail of the 'shrimp' is at the top of the picture). Swelling of a starfish arm after attack by *Hymenocera* is shown in the picture on the left



sometimes die rapidly, despite their enormous resistance and regenerating power, and pollute the aquarium water. This occurs chiefly in winter, when the temperature of the sea water along our coasts is very low (2-6°C), and in these circumstances I would advise you to use only small starfishes until they are entirely eaten. It is even better to acclimatise the starfishes progressively to higher temperatures before they are placed in the aquarium. Very small starfishes become accustomed to tank conditions more quickly than do bigger ones. Since when big *Asterias* die they can pollute the water more rapidly I prefer to use small ones. *Hymenocera* are found near or on their natural food, the starfish, most of the time and this somewhat resembles an example of symbiosis. However, symbiosis gives advantages to both partners and here there is advantage for the shrimp but not for the starfish!

During a merciless attack by one of my harlequin shrimps upon a sub-tropical starfish (*Echinaster sepositus*), I observed that the latter's defence is entirely passive though extremely efficient. The



*Hymenocera picta* is capable of making a rapid backward jump if disturbed suddenly although normally the animal is slowly moving and remains within a circumscribed region of an aquarium.

shrimp alternately buried its 'daggers' deeply into the starfish's arm at two different places and this enabled me to see how this arm was made useless. About 5 minutes after this operation, during which time the starfish remained almost motionless, a part of the arm was hanging quite paralysed. Shortly afterwards the paralysed parts swelled up to bursting point, and the tension of the skin visibly increased. Suddenly some tissue fluids of the starfish clouded the water in the vicinity. The empty bits of the starfish arm then looked like a punctured tyre. To my astonishment I saw that the separated parts of the starfish arm coiled in a rapid constriction, took in water and then went their own way! And the starfish, which now had no more than four and a half arms, also moved away on its feet; so we can conclude that the paralysing effect is only momentary. The swelling of the attacked parts is caused by the starfish, which uses constriction and coiling as a way of defence—the loss of an arm seeming a somewhat expensive way of gaining liberty! The tissues could be clearly seen at the wound at the extremity

of the damaged arm, but a few hours later, these were no longer visible although the arm had become shorter by three-quarters. The two severed arm parts were stroked and then eaten by both shrimps. Eating may take up to 3 weeks, depending on the size of the piece of starfish. I never observed this passive defence with *Stomatopoda*, but only a coiling of a whole arm starting from a fracture situated near the middle of the animal. Perhaps these 'escape-fractures' of starfishes are comparable with the well-known phenomenon of the separation of the tail of a tuatara lizard.

Sex differences in the shrimps are difficult to judge because the animals differ from each other very little as regards constitution, size and shape. However, if we examine them closely, it can be seen that the colours are not completely identical in the sexes. Those shrimps with a pale rose basic colour and pretty blue designs around the spots are perhaps the females, and those with a bright salmon basic colour and lightly coloured and less well-defined spots the males. Mostly the pairs stay together; these animals don't wander great distances but always stay within a small area of about a square foot in the tank. According to where the food (starfishes) is to be found, this relatively small territory can slowly change to another area. Individuals of the same sex are extremely intolerant of each other and fight if a 'stranger' makes so bold as to enter their small territory. Fights do not inevitably end in death and in the happier cases the most damaged crustacean 'sounds the retreat'.

In discussions with other hobbyists I have heard some say that these shrimps die if one partner of a pair is separated from the other or has died in the struggle for life. However, I have never remarked anything like this in my marine tank although three *Hymenocera picta* have been living in it for a long time and there was a pair with a partner that died later on; despite all this, everything was O.K. If food is required and the shrimps wander on a food search and thereby go out of their own territory, it does sometimes come to fighting, but die of grief—no, I can't believe it!

If harlequin shrimps are violently disturbed, these peaceful and slow animals can jump rapidly backwards and save themselves by swimming movements made with their typical swimming legs, which are visible as thin membranes, in this way escaping from their enemy.

I saw how bitterly these little shrimps can fight when I opened a plastic bag in which were two *Hymenocera picta*. Even while being transported and placed in the tank they clinched with each other and I had to separate them with some vigour or there would have been a fatality. In such battles the size of the shrimp seems of almost no importance since the smallest one can be the winner. I

once observed a tentacle of a small sea anemone that came in contact with one of the strong pincers of a harlequin shrimp simply cut off. Later, I heard the report of a Rotterdam aquarist that he

had observed one of his harlequin shrimps being eaten by a *Cerianthus* (tube rose). My *Hymenocera picta* also showed a great interest in some of my decorative snails, which I didn't appreciate at all!

## MARINIST'S Notebook

By ROY PINKS

If the new marinist is to prosper he will need to develop his powers of discrimination to the fullest degree possible. There is a bewildering mass of attractions to beguile him, together with numerous blind alleys in which he can lose both his way and his money. Despite the urgings of certain parts of the trade and, regrettably, of several writers, not every newcomer is a dyed-in-the-wool enthusiast: many marinists simply haven't the money, the time or the inclination to immerse themselves as completely in the hobby as do others, yet their claims on our attention and advice are as valid as those of the case-hardened specialist with a houseful of tanks. In fact, it could be argued that, numerically, the modest marinist is the norm.

It is a tiresome fact that just as soon as he has got his new tank in running order our hero is assailed from all quarters with gratuitous advice to fill it with every imaginable marine thing he can lay his hands on, and if one urges caution one is accused of halting the advance of scientific learning. When one thinks for a moment precisely to what extent the average aquarist actually contributes to the sum total of hitherto unknown facts, it will be realised that most exhortations to plunge deeply at the outset are as mischievous as they are misleading. For this reason I welcome efforts in any quarter to foster the study of individual facets of the hobby, rather than to over-press the claims, doubtful as they are, of the community aquarium. I think this is one point at which the freshwater enthusiast and the marinist must really sort out their respective priorities, because whereas a freshwater community tank is usually a great success, the marine counterpart seldom is, at least in the long term.

This is not so much that one cannot, by careful selection and handling, build up a collection of compatible marine fishes, but that the result is often, on analysis, a Steptoe's Yard of incongruities and visual offences which do little for one's self respect. The alternative may not be all that easy to achieve, but it would help considerably if every new marinist could at least equip himself with a plan of campaign before buying even a single fish. Supposing that it is wished to equip and maintain a

30 gallon tank in one of the main rooms of your house, principally for decoration and perhaps to interest your visitors. You may spend immense effort on arranging the coral and buying some pretty fish and, having completed the whole thing, will realise that something is horribly wrong. It could be that you had unconsciously bought some red and some white coral and introduced two blue damsels. Twenty or more years ago even the most patriotic gardeners had to admit that red geraniums, white alyssum and blue lobelia left a lot to be desired as visual attractions when associated as a trio, yet each as a sole act was a potential traffic stopper.

It would be thoroughly mean to suggest that the new marinist should confine his first tankful of fish to a single species, but he should carefully visualise the final effect before committing himself to any purchase. In the case we have chosen a most satisfactory basis could be formed by the use of coral sand on the floor of the tank, with groupings of white coral in its numerous forms to constitute as large a feature as the tank will allow. Eight or ten percula clowns and two regal tangs would provide a highly significant colour contrast, and their unique body shape and swimming habits label them as being something special and distinct from freshwater species, which, to some (but not to me!) are considered faintly passé.

If only the possessor of a tank like this could contain himself for a few months he would see his stock improve in colour and size, and he might even find out a few things about their communal lives, though this is really only of relevance to his particular collection. At all events such a modest approach is a safe one as well as being effective. It would be less so if he bought eight mixed clowns and two different tangs, whose diversity would be merely irritating. The discrimination for which I have counselled would have achieved a far more arresting effect, quite apart from the incidental tranquillity as between the species which would have been most unlikely in the case of the alternative selection.



by  
ARPEE

## Personal COMMENT

**P**ROSPECTIVE buyers of fish are often perplexed at the disparity in size of fish of any given species which are offered for sale at the same price. The effect of this is that one gets no credit for having bought undersized fish, and as one might expect, one is charged a premium for fish of above average size. There is a rough sort of justice about this, I suppose, and I wouldn't quarrel too forcibly with the prices charged for fish of average size and above. Below that point I am very far from satisfied that things are as they should be. The sale of juvenile fish may be a lucrative occupation, but from the buyer's point of view it needs to be studied carefully. Much as I dislike over-regulation of business activity by statute I must admit that I would welcome much tighter control of standards in the pet trade, and this matter of sizing would come fairly high on my list of things that need doing.

It is true that there is a wide difference between the risks of buying a juvenile neon and a juvenile oscar. The former has much of a chance of survival only in a tank containing fishes of the same size, and this seldom happens after the setting up of a new tank, when it is quite a good idea to buy small specimens and let them grow on. With the oscar the juvenile fish has a very good chance of survival in almost any company, though I have seen cases where the most absurdly small cichlids were on sale in a tank containing larger fishes which were having a fine old time nibbling here and biting there: the outcome could have scarcely been other than disastrous for all concerned.

There is, of course, a vast difference between undersized fish and young adult fish, the latter being probably the best general buy for the average aquarist. At this stage the inoffensive fish will have passed the stage where they are simply tempting nourishment for anything senior to them. Perhaps they have ceased to be tasty or they have found out how to keep out of harm's way—at any rate, there seems to be a point at which they find it comparatively simple to survive. At the same point the more aggressive fish have not found the full range of their nastier characteristics, and may, with discretion, be associated with gentler species in the considered hope that they may find it possible to

co-exist peaceably. It reminds one somewhat of the temporary immunity which a whiteworm enjoys when offered to a fish in its transit bag. When the fish is released into its new quarters it will fend straightaway on the whiteworm it so recently spurned.

I introduced some youngish knife tetras to one of my tanks some time ago which contained the usual small neons and pencilfish etc. Complete peace has prevailed, though the knife tetras are now vast by comparison, and I would certainly not have risked introducing them at this size to a tank containing smaller fishes. This guideline would not apply, of course, to the larger and more pugnacious cichlids, different species of which simply will not mix even when not fully adult, so it is important to study the habits of all the fishes likely to be included in any given collection before admitting newcomers of markedly different size from the 'residents'.

On the marine side of the hobby there is increasing evidence that undersized fish are being put on to the market, and since there is no home breeding of these species the blame must be laid fairly and squarely on the importers, and dealers should refuse absolutely to handle material of this sort. There are ways and means of coping with some of the too small freshwater species, unwanted though these may be, but with saltwater fishes there are very few of which it can truly be said that size does not count. The neon goby does come to mind as a species which is fairly safe even when quite small (it never grows large, anyway), but here are two very good reasons why most others should be excluded. In the first place, the extreme territorial outlook of most marine species puts every newcomer to a tank at some risk, and more particularly a small new entrant is in considerable danger of mutilation or complete destruction. The consequences of introducing undersized fishes are therefore fairly obvious. The other aspect is that whilst, in isolation, certain undersized specimens of given species may well grow on tolerably well, given plenty of room, there are some groups of fish, like the butterflies, whose juveniles, let alone undersized fish, seem to require foodstuffs which we cannot muster for them. They therefore last but a short time in captivity and die most miserably, a wretched waste of life if ever there was one.



The preparation of pond fish for the ordeals of winter need not be the formidable task which many pondkeepers suppose it to be, but it is true that a certain amount of anticipation pays off hand-



somely. In the well-established pool which is understocked with fish, few problems will ever arise from the fact that the owner has failed to feed them during the summer and autumn, though earthworms, cut to size if necessary, are useful additions to natural captures by the fish themselves, and presumably help to maintain the peak of condition which fish should have reached before their winter rest. With newer ponds, and especially where there has been a tendency to overcrowd, the fish may need something of a booster from early autumn until the air chills and they sink into a state of inactivity.

As much live food as can be contrived should be introduced during this period, and discreet amounts of dried or pelleted food can be added. Careful watch should be kept on how quickly the fish actually dispose of the dried food: it will be found that they take far less than ever they did during the warmer days, and the quantities will diminish even more rapidly as time passes. Needless to say, any quantity of uneaten food will contribute to the dangers of pollution below ice if there is a sudden severe cold snap, though many writers greatly exaggerate the actual dangers of surplus dried food. If there are snails present in the pond, only gross overfeeding is likely to cause real trouble, as the danger margins are pretty wide. The bigger and older the pond and the fewer the fish, of course, the less the trouble.

If adequate precautions are taken, before the onset of freezing weather, to prevent surplus vegetation from building up (and this includes the intrusion of unwanted tree leaves), the pond can usually be left severely alone until spring time. If, nevertheless, there are vegetable surpluses to be seen, it is wise to take advantage of every spell of mild weather to dispose of them without disturbing the pond floor, in the mud of which numerous fish will probably be resting. One is often recommended to clean out a pond every few years, but I have consistently dodged this issue and apart from some overgrown water lilies and marginals, no intolerable excesses seem to have occurred. The real point about this is that if your pond is comparable with a natural one, which is both understocked with fish and overstocked with decomposing vegetation, you

will probably get by with minimal losses, even in the severest of winters. If you have the balance the wrong way, though, you are likely to lose fish because of the build-up of noxious gases beneath the ice.

Many writers recommend the use of a pool electric immersion heater. This is claimed by the makers to maintain a hold in the ice, and this enables any unwelcome gases to escape, and oxygen to enter. In a very small and shallow pool I must admit that there is something to be said for this device, but I am much less happy about its real worth in circumstances where there is a lot of water. I was told the other day by one of their users that his heater worked perfectly—it made a nice ice-free hole in the ice, and all the fish came and swam round and round and round in that area, and wouldn't go anywhere else! Now, I very much hope that those fish will have enjoyed their mid-winter warm bath, but I equally hope that I shall not hear that, after all, they failed to survive the winter for some inexplicable reason. I fear there will be circumstances where the fish are attracted from very cold water to a much warmer stratum, in which they will become more active, without food, at a time of great stress. If they are suddenly frightened away into the colder depths it seems to me that there is a danger of chilling, leading to secondary infections of one sort or another. I can see that with very deep ponds and very big ones, the effect of the heater may not penetrate to the fish, which are out of harm's way, well down below, but the pondkeeper contemplating one of these accessories should assess quite carefully how he proposes to use it. It may be possible to make a perforated screen and place the heater in the centre of it, keeping all fish at least 2 feet away from its influence. Used with thought and some imagination, a pool heater can indeed remove one of the worst causes of pond fish loss during winter; where there is any doubt about the matter, it will be found that there are many ways of making holes in ice, and some can be quite fun. On no account, however, must ice be hit or banged because the sound vibrations through the water can seriously derange and even kill the fish which are within the pond basin.

## Meetings and Changes of Officers

**ANNON AC.** Chairman, Mr F. Smith; treasurer, Mrs R. Howe; secretary, Miss C. Stone (22 Macfarlane Road, Shepherds Bush, London W12); show secretary, Mr K. Carter (134 Gladstone Park Gardens, Dollis Hill, London NW2); show manager, Mr B. [unclear]

**BARRY AS.** Chairman, Mr A. Wallace; vice-chairman, Mr G. Parker; secretary, Mr M. C. Guthrie (4 Nurston Close, Rhosce, Glamorgan); show secretaries, Mr A. Wallace, Mr K. Thomas; technical advisor, Mr D. Warrant. Meetings: 4th Wednesday of month, 7.30 p.m., The Red Cross Rooms,

High Street, Barry. New members welcome, senior citizens reduced rates.

**BRACKNELL AS.** President, vice-president, Mr & Mrs K. Roberts, of the Admiral Cunningham Hotel, Bracknell; chairman, Mr L. Jordan; vice-chairman, Mr D. Arkell; treasurer, Mr K. Phillips; secretary, Mr T. Crockett (15 The Larches, Warfield Park, Bracknell; phone Winkfield Row 459); show secretary, Mr J. Nicholls; programme arranger, Miss Mary Morgan.

**BRITISH AQUARIST STUDY SOCIETY.** President, Mr J. Williams; chairman, Mr P. Bird; vice-chairman, Dr G. Cuss; secretary, Mr D. Cooke. Research com-

vice-chairman Mr R. Exeler; secretary, Mr E. Venton; Mr H. J. Aylott & Mr M. Thomas.

**BRITISH ICHTHYOLOGICAL SOCIETY.** Chairman, Executive Committee, Major N. A. Lunn; secretary, Mr D. Merthborough (The Newfields Wildlife Garden City, Hants); editor, Mr G. K. Southport (21 Holmston Avenue, Lanes, Beds.); librarian, Mr W. Butler.

**BRITISH Koi-KEEPERS' SOCIETY.** ANGLIAN SECTION. Details from Mr R. Chapman, 270 Heath Road, Ipswich, Suffolk.

**BKKS. EAST MIDLANDS SECTION.** Details from Mr D. Budge, The Cottage, Oxford Lane, Harby, Leicesters.

**BKKS. NORTHERN SECTION.** Details from Mr R. Seal, 7 Highfields Road, Olferton, Stockport, Cheshire.

**BKKS. WATFORD & DISTRICT SECTION.** Details from Mr J. H. Hunt, Pondsence Cottage, Springfield, Bushey Heath, Herts.

**BKKS. WEST MIDLANDS SECTION.** Details from Mr & Mrs A. Danks, 43 Field Barn Road, Hampton Magna, Warwick, CV18 8RN.

**CHINGFORD & DAS.** New Secretary, Mr G. B. Toller (11, Kenwood Road, Chadwell Heath, Basildon, Essex) phone 44-889 (0742).

**EAST LONDON A & PA.** President, Mr P. Campbell; vice-president, Mr P. Arnold; Mr J. Brydon; Mr A. Field; Mr Peter; Mr Taylor; chairman, Mr M. Freeman; vice-chairman, Mr K. Wyllinton; general secretary, Mr F. Harris; treasurer, Mr A. Harris; show secretary, Mrs J. Atney; show organizer, Mr D. Atney; social secretary, Mr J. Bass; librarian, Mr C. Brown; editor, Mr B. Argent; Press secretary, Mr R. Priest (11 Molehill Avenue, Newbury Park, Hod, Essex); programme secretary, Mr D. Flock; equipment officer, Mr L. Balon. Meetings: 1st & 3rd Friday of month.

**ERITH & DAS.** Secretary, Mr E. A. Beadle (118 Broadway, Bexleyheath, Kent, DA5 2ER); show secretary, Mr M. Thomas (4 Mayfield Close, Bexleyheath, Kent). Meetings: alternate Wednesdays, 8.30 p.m. till 10.15 p.m., Elmer Community Centre, Haux Road, Bexley, Kent.

**HIGH WYCOMBE AS.** Chairman, Mr I. Pierce; vice-chairman and assistant show secretary, Mr A. Hall; treasurer, Mr S. Wilkinson; secretary, Mr J. Buxley (phone: Pons 1849); FBAS and Trade-Committee delegate, Mr D. Lynn; Trade-Committee delegate, Mr R. Cox; librarian, Mr D. Schreiner; equipment officer, Mr R. Cox; P.R.O., Mr T. Green (12 Gosswood Meadow, Chisney, Oxford); editor, Mrs B. Buxley.

**LINCOLN & DAS.** President, Mr H. Kellin; treasurer, Mr Kenneth; secretary, Mrs B. Selton (44 Hambley Avenue, Cherry Willingham, Lincoln LN9 4JF). Meetings: 1st Monday in month, 7.30 p.m., The Leland Club, 36 Southwell Square, Lincoln.

**NAILSEA & DAS.** New Society, Chairman, Mr W. Hollett; vice-chairman, Mr P. Finch; secretary, Mr M. J. Ellick (4 Berrington Close, Nailsea phone: Nailsea 4195); assistant, Mrs F. Garret; treasurer, Mr P. Stamp.

**NEW FOREST AS.** Meetings: 1st Monday of month, 7.45 p.m., Community Centre, New Street, Lymington, Hants.

**NEWBURY & DAS.** Chairman, Mr G. N. Shaw; vice-chairman, Mr R. Bennett; secretary, Mr G. Taylor; treasurer, Mr R.

Brown; show manager, Mr P. Legg; show secretary, Mr G. Foster; P.R.O., Mr R. K. Lewis (77 Digby Road, Newbury, Berks).

**NEWCASTLE GUPPY & LIVEBARKER SOCIETY.** Chairman, Mr J. A. Ludlow; vice-chairman, Mr R. Rorty; secretary, Mrs J. Burton (128 Dunstan Tower, Garth 18, Jillingworth, Newcastle upon Tyne, NE14 6TX); treasurer, Mrs J. Fenwick; librarian, P.R.O., Mr G. Fenwick.

**OLDHAM & DAS.** New secretary, Mr E. Birchwood (10 Iversham Avenue, Blackley, Manchester 9).

**PETERSFIELD & DAS.** New Society. Secretary, Mrs J. M. Upton (18 The Caseway, Petersfield, Hants, GU31 4JF) phone Petersfield 4881. Meetings: alternate Tuesdays, 7.45 p.m., The Garden Room, High Street, Petersfield.

**PONTEFRAC & DAS.** Chairman, Mr D. Cohen; secretary, Mrs P. Dickinson (8 Hatfield Lane, Newton, Pontefract); show secretary, Mrs R. Cohen (24 St Oswald Avenue, Pontefract); treasurer, Mr J. Dickinson; publicity officer, Mrs D. Conley; Meetings: 1st Wednesday in month, 7.30 p.m., Pontefract Boys Secondary School, Cuslton, Pontefract.

**ROEHAMPTON AS.** Chairman, Mr N. Sackel (phone: 01-846 1787); treasurer, Mr J. Hughes; secretary, Mrs P. Lambourn (7 Wheeler Court, Plough Road, London SW11 2AN) phone 01-842 8730; show secretary, Mr D. Lambourn; social secretary, P.R.O., Mrs G. Scrymgeour; Meetings: alternate Wednesdays, Memorial Gardens, 654 Peoples Hall, Minstead Gardens, Rushington, London NW11. New members welcomed.

**STROUD & DAS.** Chairman, Mr C. Whitaker; secretary, Mrs D. Cole (Avignon, The Hill, Redrock Street, Gloucester; phone: Stroud 4904).

**SUFFOLK A & PA.** New P.R.O., Mr E. Cook (449 London Road, Ipswich, Suffolk).

**THORNE AS.** Secretary, Mr P. H. Powell (204 Southfield Road, South Cottingham, Thorne, 20, Doncaster, Yorks).

**TORRAY AS.** Chairman, Mrs R. Mansfield; vice-chairman, Mr G. Thompson; secretary, Mr J. Denton; show secretary, Mrs Griffiths; assistant, Mr Geoffrey; treasurer, Mr Cowley; editor, Mr M. Matthews; librarian, Mr McMillan; social secretary and P.R.O., Mrs P. Brown (18 Marston Close, Torquay, Tor 8JF); junior members representative, Mavis Liffa.

**VILLAGE AS.** Chairman, Mr J. Beasley; secretary, Mr F. Thomas (18 Minter Drive, Chasde, Chesham, SR3 4JL); treasurer, Mr B. Gutter; show secretary, Mr A. Collins.

**WEDNESBURY & DAS.** New Secretary, Mr R. Law (14 Row Hughes, Bowler Road, Walsley, Wyo. BR 6DT).

**WELWYN GARDEN CITY AS.** Chairman, Mr R. Nicks; secretary, Mr L. Pons (25 Lidsale, Welwyn Garden City, Herts.); treasurer, Mr D. Pitts; programme secretary, P.R.O., Mr M. Graham; show secretary/librarian, Mr A. Mergrove (63 Blythways, Welwyn Garden City); district and social secretary, Susan Pitts; junior representative, Mr P. Loun; Meetings: 1st & 3rd Monday of month, 8.00 p.m., The Scout Hut, Great Dull, Welwyn Garden City, Herts.

**YATE & DAS.** Chairman, Mr J. Powell; vice-chairman, Mr C. Stockland; treasurer, Mr M. Ridge; secretary, Mr & Mrs B. Heywood (26 Deerhurst, Yate, Bristol, BS7 4JH) phone Chipping Sodbury 313741; editor, Mr B. Seal; show manager, P.R.O., Mr R. A. Bennett. Meetings: 1st Monday of month, The Hall House, Cusins Heath, New members and visitors welcomed.



THE first exhibition of tropical and coldwater fish to be held by the **BURY ST EDMUNDS & DAS** was a great success and attracted a lot of interest and enquiries regarding the Society. Displays mounted by the Muckfield Fish Centre and The Great Ouse River Authority contributed to this and Mr Birch and Mr Keen are thanked for their help. The table show was judged by Mr Yates of Cambridge, an FBAS class judge; the best fish from the 20 in the show was judged to be a ramirezii (83 points) owned by Mr V. Green (trophy donated by Mr E. Webb & Sons), closely followed by a Norman's headstander (72 points) owned by Mr R. Kent. Class winners were:

B: 1 & 2, Mr V. Green; C: 1, Mr R. Kent; 2, Mr V. Green; D: 1, Mr R. Kent; 2, Mr V. Green; E: 1, Mr J. Woodhouse; G: 1 & 2, Mr R. Kent; 1, Mr E. Keen; 2, Mr V. Green; M: 1, Mr D. Keen; 2, Mr E. Woodhouse; N: 1, Mr V. Green; 2, Mrs W. B. Collins; O: 1, Mr W. S. Clarke; Q: 1, Mrs E. Keen; 2, Mr E. Keen; R: 1, Mr W. S. Clarke; 2, Mr V. Green; S: 1, Mr W. S. Clarke; 2, Mr D. Keen; Breeder: 1, Mr V. Green; 2, Mr D. Keen; V: 1 & 2, Mr W. A. Clark.

OVER 600 entries were received at the **NEWBURY & DAS** Open Show. Winners of the trophy awards were: Peggy Dixon trophy and gold pin, best fish in show, Mr A. Bann (Basingstoke); FBAS Championship trophy, Mr A. Baker; G. Swat trophy, best guppy, Mr A. J. Cree (WADAS); J. Lloyd's trophy for best

Canary, Mr L. Little (Beckenell); C. Dixon tankard, best cichlid, Mr A. Tall (Salisbury); G. Foster trophy, best killifish, Mr J. Gerrard (Runnymede); Queensborough trophy, best angelfish, Mr J. Nethersell (River-side); N. Richards trophy, best *Corydoras*, Mr M. Nethersell (River-side); Brian Barrett trophy, best goldfish, Mr R. C. Cowley (Gosport); A. Taylor trophy, best (DB) cichlid, Mr A. Tall (Salisbury); best Ladies Entry trophy, Mrs J. Lloyds (Newbury); best Junior Entry trophy, Mr K. Basson (Basingstoke); R. Lloyds trophy, best furnished aquaria, Mrs B. Jackson (Basingstoke); NDAS trophy, best Labco, Mr D. Purchard (Tonbridge);

*Mr J. Thorne, secretary of VIL-LAGE AS makes the following announcement with deep regret: 'It is with deep sorrow that I report the death of the founder and honorary secretary of our Society, Mr S. Hoop, at the age of only 33 years. Mr Hoop was an enthusiastic and hardworking secretary, and was for several years a member of Belle Vue AS, and was for the past 12 months a member of both societies. Last Easter he and other members of Belle Vue took a stand in the Scottish Aquarists Festival and made many friends north of the border. He also was Best in Show award at the 1973 British Aquarists Festival at Belle Vue. Mr Hoop leaves a young widow and will be sadly missed by his friends in the fishkeeping community.'*

NDAS trophy, best loach, Mrs J. Lloyds (Newbury); G. Turner Cup, best rainbow, Mr J. Pollard (Kingston); Berkshire Aquatics trophy, best labyrinth, Mr D. Markay (S.D.A.S.). Other results were:

1. Mrs B. Jackson (Basingstoke); 2. Mr K. Basson (Newbury); 3. Mr R. Mowat (Tonbridge); 4. Mr D. B. Studdell (Tonbridge); 5. Mr A. Marshall (Basingstoke); 6. Mr B. Lofsey (NDAS); 7. Mr A. Hales (Basingstoke); 8. Mr D. Studdell; 9. Mr A. Marshall; 10. Mr L. Lane (Tonbridge); 11. Mr B. Basson; 12. Mr Alan Carter; 13. Mr J. Jackson (Basingstoke); 14. Mr Turner; 15. Mr B. Basson; 16. Mr J. & S. Hoop (Newbury); 17. Mr A. Tall; 18. Mr K. Basson; 19. Mr B. Basson; 20. Mr W. Cooper (Luton); 21. Mr H.G. (Tonbridge); 22. Mr Lane (Gosport); 23. Mr T. Taylor; 24. Mr H.G.; 25. Mr D. Purchard; 26. Mr J. & S. Hoop; 27. Mr & Mrs Marry (Gosport); 28. Mr J. Gerrard; 29. Mr Gibson (Tonbridge); 30. Mr M. Coot (Gosport); 31. Mrs Northcott; 32. Mrs Lewis; 33. Mr B. Basson; 34. Mr M. Nethersell; 35. Mr A. Hales; 36. Mrs J. Lloyds; 37. Mr Purchard; 38. Mr B. Basson; 39. Mr J. Jackson; 40. Mrs J. Lloyds; 41. Mr A. Baker; 42. Mr J.

## FEDERATION Extension of Services to Federated Societies



WITH the current fuel crisis, societies are finding themselves without a visiting speaker and the Federation's Tape/Slide lecture programme service is being heavily used. However, two new titles should be available (conditions permitting) during March: 1. 'A.O.S. Catfishes' by D. Lambourn, Rotherham AS and Catfish Society; 2. 'Breeding Techniques with Killifish' by C. Brown, Herdon AS and secretary, FBAS Judges & Standards Committee. Two new booklets 12 & 13 will be available in the Spring: no. 4. 'National Goldfish Standards' (filling an obvious gap in the National Standards Series); no. 5. 'FBAS Constitution and Rules' (which with the Maximum Sizes Sheets for all classes will give the competing aquarist all the facts for a successful season). Enquiries please to the general secretary, Mr H. Parrish, 18 The Basons, St Margarets, Twickenham, TW4 2AP.

Wilson, Mr. J., Mr D. Purchard, 2. Mr Carnegie (Scribble); 3. Mr J. Northcott; Mr J. Lloyds; 4. Mr A. Miller; 5. Mr J. Taylor; 6. Mr A. Coo (Widley); 7. Mrs Canning (Basingstoke); 8. Mr A. Watts (Luton); 9. Mr & Mrs Marry (Gosport); 10. Mr A. Watts; 11. Mr E. Adams; 12. Mr L. Porter (High Wycombe); 13. Mr W. Gallow; 14. Mr J. Northcott; 15. Mr F. Coot; 16. Mr L. Little; 17. Mr Lloyds (Maidenhead); 18. Mrs Northcott; 19. Mr P. Marshall (Gosport); 20. Mr A. Coo; 21. Mr M. Burgess; 22. Mr B. Oulton; 23. Mr R. James; 24. Mr D. Sheridan (Newbury); 25. Mr G. Dixon; 26. Mr B. Oulton; 27. Mr A. Tall; 28. Mr E. Thomas (Basingstoke); 29. Mr R. Cowley; 30. Mr J. Cooper; 31. Mr Bernard (Farnborough); 32. Mr B. Oulton; 33. Mr J. Pollard; 34. Mr A. Marshall; 35. S. & D. Jackson (Basingstoke); 36. W. & S.; 37. Mr V. Hunt (Basingstoke); 38. Mr N. Wood (Gosport); 39. Mr V. Hunt (Havant); 40. Mrs Gales (SPASS); 41. Mr G. Herring (SPASS).

THERE were 848 entries from 35 societies at the DONCASTER & DAS Open Show, the Best Fish in Show was exhibited by Mr H. Kuhn (Lincoln); best exhibitor, Mr Reid (Workop); Society with most points, Ayrborough.

Gosport: 1. Mr & D. Lanyon (Shaft Valley); 2 & 3. Mr J. Smith (Castledare); 4 & 5. Mr Andrews (Hull); 6. Mr W. Blundell (Gosport); 7. Mr A.

Brown (Castledare); 7 & 8. Mr & Mrs R. & Scott (Shaft Valley); 9 & 10. Mr Douglas (Hull); 11. Mr & Mrs Norton (Shaft Valley); 12. Mr J. Tans (Shaft Valley); 13. Mr J. Furness (Castledare); 14. Mr R. Latham (Darby Rogent); 15. Mr & Mrs Dixon (Doncaster); 16. Mr J. A. Whaley (Ayrborough); 17. Small cichlids: 1. Mr & D. Lanyon (Shaft Valley); 2. Mr & Mrs Cohen (Pontriffract); 3. Mr R. Elliott (Carby); 4. Mr Chenevix; 5. Mr & B. Booker (Ayrborough); 6. Mr R. Hallow (Darby Rogent); 7. Mr J. A. Whaley (Ayrborough); 8. Dwarf cichlids: 1. Mr H. Kuhn (Lincoln); 2. Mr J. A. Wiley (77); 3. Mr J. Bowers (Harlepool); 4. Angelfish: 1. Mr B. Bailey (Shaft Valley); 2. Mrs Igan (74); 3. Mr G. Wilkinson (Hills); 4. Mr Cichlids; 5. Mr Reid (Workop); 6 & 7. Mr & Mrs Walker (Shaft Valley); 8 & 9. Mr & Mrs Harris (Milton cichlids); 10. Mr & Mrs Harris (Gainsborough); 11. Mr J. Bowers (74); 12. Mr Scott (Castledare); 13. Small barbs; 14. Mr & Mrs Tovey (Shaft Valley); 15. Mr & Mrs Dickenson (Pontriffract); 16. Mrs G. Oulton (Barns); 17. Mr Barro; 18. Mr G. G. (Pontriffract); 19. Mr & Mrs Cohen (Pontriffract); 20. Mr T. South (Shaft Valley); 21. Corydoras cichlids; 1. Mr & Mrs Wells (Doncaster); 2. Mr B. Bailey (75); 3. Mr Gillespie (74); 4. Mr J. S. Hall (Ayrborough); 5. Mr & Mrs Gale (77); 6. Mr K. Price (73); 7. Mr & Mrs Simpson (74); 8. Mr & Mrs B. Booker (71); 9. Mr & Mrs Tiffin (72); 10. Ayrborough; 11. Mr L. Smith (Castledare); 12. Mr H. Carr (Doncaster); 13. Mr F. Bainton (73); 14. Mr & Mrs Anderson (Doncaster); 15. Mr & Mrs Aldington (Doncaster); 16. Mr & Mrs Toulburn; 17. Mr N. Carr (78); 18. Mr H. Kuhn (77); 19. Mr & Mrs Torrie (74); 20. Small cichlids: 1. Mr K. Burrett (74); 2. Mr & Mrs Townsend (71); 3. Mr Gaten (72); 4. Mr & Mrs Cohen (74); 5. Mr D. E. Carnegie (71); 6. Mr G. Williams (Shaft Valley); 7. Mr J. Bowers (75); 8. Mr & Mrs Cohen (73); 9. Mr & Mrs Barrell (72); 10. Mr & Mrs Thickbroom (Castledare); 11. Mr W. Blundell (77 & 78); 12. Basingstoke; 13. Mr & Mrs B. & R. Booker (75); 14. Mr B. Mrs Walls (74); 15. Mr & Mrs Tiffin (74).

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FUNGUS CURE

Nov Tropical: 1, Mr A. Barrett (80); 2, Mr & Mrs Burr (78); 3, Mr & Mrs Gabe (76).

Pairs, livebearers: 1, Mr & Mrs Parks (Sheffield, 76); 2, Mr & Mrs Toyne (74); 3, Mr J. Furness (72). Pairs, egg-layers: 1, Mr & Mrs Wells (78); 2, Mr Reid (77); 3, Mr & Mrs Gilling (Gainsborough, 76). Breeders, livebearers: 1 & 2, Mr & Mrs Toyne (75 & 76); 2, Mr W. Blundell (73). Breeders, egg-layers: 1, Mr Reid (82); 2, Mr Rhodes (Scunthorpe 80); 3, Mr & Mrs Gilling (70).

Goldfish & comets: 1 & 2, Mr J. S. Hall (75 & 72); 3, Mr M. Bower (68). Shubunkins, fancy goldfish: 1, 2 & 3, Mr J. S. Hall (78, 75 & 73). Nov Coldwater: 1, 2 & 3, Mr J. S. Hall (74, 72 & 71). Junior, livebearer: 1, Mr P. Hampson (8th Humber, 74); 2, Mr K. Stephenson (Sherwood, 73); 3, Mr A. Barrett (Castleford, 72). Junior, egg-layers: 1, Master Furness (Castleford, 75); 2, Master Elliott (Corby, 74); 3, Miss Perkins (Workington, 72). Novice, livebearers: 1, Master Wilson (8th Humber, 76); 2, Mr A. F. Clark (8th Humber, 72); 3, Mr A. Clarke (8th Humber, 71). Novice, egg-layers: 1, Mr S. Withers (Gainsborough, 77); 2, Mr F. W. Stuart (Eboracum, 76); 3, Mrs Asquith (Castleford, 74). Plants: 1, Mr & Mrs King (Doncaster, 79); 2, Mr G. Ibbotson (Kettleby, 74); 3, Mr L. Smith (72). Furnished jars: 1, Mr R. Haslow (76); 2, Mr & Mrs Toyne (74); 3, Mr & Mrs Gabe (74). Ladies, livebearers: 1, Mrs Birdsall (Aireborough, 72); 2, Mrs Hall (Aireborough, 71); Mrs Cohen (Portefer, 68). Ladies, egg-layers: 1, Mrs Booker (Metcumbe Bay, 80); 2, Mrs Hall (78); 3, Mrs Copley (Doncaster, 74).

**WREXHAM TFS** members have been enlightened at recent meetings about a variety of subjects in talks given by committee members Mr T. Pound, Mrs V. Oliver, Mr E. Jones, and Mr R. Mathers on subjects varying from 'How to set up a furnished jar' to 'Diseases' and 'Live Food Cultures'. They have also been entertained by a very enjoyable picture quiz deviously thought up and put together by Mr R. Mathers and Mr E. Jones. At the Annual Presentation Dinner at the Whitesands Hotel, Cefn-y-bedd, the various trophies won by members were presented by show secretary Mr C. Pritchard and by Mr F. Oliver who held the three major trophies during the past season. Winners were: Paramount trophy (Fish of the Year), Mr T. Pound; Cunliffe trophy (Home Aquarium Competition), Mr E. Jones, with a special award to Ian St Clare for an outstanding junior effort; Endeavour trophy (most points gained during year), Mr E. Jones, with Mr T. Pound runner up and Mr R. Mathers third. The prize for the highest pointed junior was awarded to Brett Roberts.

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AQUARIUM  
FERTILIZER TABLETS

## In Brief . . .

. . . **WHEN YATE & DAS** held their social evening, visitors from Bath AS & Bristol Aero AS joined in the Christmas draw and an enjoyable evening was had by all. The Society wish all in Severnside AA a happy 1974.

. . . **MR A. COOK** of **SUFFOLK A & PA** was sincerely thanked for the hard work he had put into the position of P.R.O. when he retired at the end of last year. The new P.R.O. is Mr K. Cook.

. . . **NEW Society, NAILSEA & DAS**, has now started a small library for its members. The Society has enjoyed a slide lecture given by Mr Gordon Churchill. Prospective new members are invited to contact secretary Mr M. J. Ellick (Nailsea 4158) for further details about the Society, which hopes to make great progress in growth during 1974.

. . . A **VERY** successful year for B. & F. Hirst of **COVENTRY P & AS** culminated in the award presentations at the Society's AGM when they received the Hogarth Cup (all classes), the Stone Cup (tropical), Essam Bowl (egg-layer broods) and Society Cup (livebearer broods); Bradbury Cup (coldwater), Mr D. Easingwood and the Society Cup for coldwater home aquaria; Dymond Cup (garden pool), Mr J. Wyleman; Court plaque (tropical home aquaria), Mr D. Ketchell; the Clarke plaque for best fish of the year was won jointly by Mr R. Patterson and Mr J. Bailey; the Elsie Herson Cup for coldwater fish of the year, Mr F.

*A DAY out for the whole family in early summer! This pleasant thought is provided by news of the MID-SUSSEX AS Fish Exhibition being held on the 26th-27th May at The Park Centre, Burgess Hill, Sussex. It is open to the public all day on Sunday and Monday (26th, 27th) and will once again feature the world-famous Crab Derby together with all sorts of other 'entertainments' that will make it an ideal day-out for all ages.*

Watts; the Farran plaque for best member, Austin Simmons; the Mayer Cup (best junior), A. Simmons.

. . . **MR B. HAMBERG** of **SWIL-LINGTON AS** won the Society's home furnished aquaria competition, judged by Mr & Mrs G. Binix (2, Mr B. Williams; 3, Mr J. Abbott). Results of the quarterly table show, judged by Mr J. S. Hall, were: Rasboras, carps & minnows: 1, Mr M. E. Hall; 2, Mrs P. Hislop; 3, Mrs A. Hislop. Livebearer pairs: 1, Mr W. Hislop; 2, Mr M. E. Hall; 3, Mrs A. Hislop. Egg-layer pairs: 1, Mr C. Townsend; 2 & 3, Mr J. Abbott. Aov: 1, Mr J. Abbott; 2, Mr M. E. Hall; 3, Mr A. Townsend. Please note that the date of the Society's Open Show is 16th June, not the previous day as originally reported.

. . . **IN** the second round of the **LLANTWIT MAJOR AS** annual table show competition for the Miles Thomas Cup, judge Mr D. Glover awarded first and third places to Mr H. Chick (2, Mr R. S. Wigg). The evening was completed with a slide show 'The Fin & Gill Club' depicting fishkeeping activities in one of America's State Prisons.

. . . **NEW FOREST AS** members have been discussing jointly alternative ways of heating and insulating aquariums during the present electricity crisis. Mr R. Travers won the table show class for mollies and Mr M. Aust that for *Corydoras* (2, Mr B. Rowe).

. . . **HASTINGS & ST LEONARDS AS** much enjoyed the slide lecture by Mr B. Funnell on pet fish. Mrs & Miss H. French won the table show for aov livebearers, judge Mr C. Pannell. Another interesting meeting had a number of speakers giving hints on rearing and breeding their 'favourite family'. The table show, judges Mr & Mrs Grieg, for miniature aquaria was won by Mr J. Mann.

. . . **MR D. Lyne** has won the **HIGH WYCOMBE AS** annual table show competition with 85½ points (2, Mr I. Pierce, 49; 3, Mr R. Leslie, 40½).

. . . **WELWYN GARDEN CITY AS** enjoyed one of its most interesting evenings when members heard Mr Alan Tuffs give a highly explicit talk

and practical demonstration on Anaesthesia and Tranquillisation of Fish. 20 of Mr Tufts' fish were anaesthetised entirely successfully with a drug called MS 222 (Sandoz), the ethyl ester of aminobenzoic acid methanesulphonate. The technique was so well demonstrated and explained, showing its simplicity in use, that the audience were persuaded that it will soon be commonly used in fishkeeping for catching, transporting, treating and generally handling fish.

NEXT TIME ASK  
FOR  
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FISH FOOD

... WHEN BARRY AS held its first annual dinner, trophies for the year were presented by president Mr C. Harding. Winner of the senior table

show competition was Mr M. C. Guthrie and of the junior table show competition, K. Thomas. Two special awards went to show secretaries Mr D. Maciver and Mr A. Wallace for their work during the year.

... MR G. Lupton of 53 Richlands Avenue, Stoneleigh, Surrey is willing to organise a local section of the **BRITISH KOI-KEEPERS SOCIETY** in his area and would be pleased to hear from anyone who is interested.

## Dates for Your Diary

2nd March. **FRAS ASSEMBLY**. Conway Hall, Red Lion Square, Holborn, London WC1, 2.30 p.m.

26th March. **MIDLAND ASSOCIATION OF AQUARIUM SOCIETIES**, Delgates Hall, Digbeth Civic Hall, Room 3, 7.30 p.m.

26th March. **CATFISH ASSOCIATION** (L&E) Open Show, Hays Hall, Hays Close, Haslemere, Surrey. Eighteen classes in 2 H. Show secretary: Mr D. Lamberton, 7 Waverley Court, Finch Road, London, SW11 2JQ (phone) 91-423 49341.

26th March. **GSGB AGM**, Conway Hall, Red Lion Square, Holborn, London WC1, 1.00 p.m.

26th March. **TINE-TREE AREA ASSOCIATION** Conference, Ray Hotel, Seabourne, Somerset. Lecturers include: Dr R. Tompsett of the British Museum. Tickets £2.50. Mr G. T. Liddle, 2 Conner Street, Law Hill, Glastonbury, Somerset, TA9 5UJ.

26th April. **NELSON AS** Open Show, (L&E) Centre, Beadley Street, Nelson, Lancs. Mr H. Hingworth, 24 Broadwood Road, Colton, Luton.

26th April (Easter Monday). **SOUTH-GLOUCESTER AS** Open Show, Avenue Hall, Southampton. Details: Mr P. Brown, 211 Seavey Road, Slating, Southampton.

26th April. **RIVERSIDE AS** Open Show, St Barnaby Church Hall, Cobbold Road, London, W.14. Details: Mr W. Netherell, 25 Greenhead Road, Fulham, London, S.W.6.

26th April. **BLAKEBOROUGH AS** Open Show, 1, Elizabethburgh & Sons, Cornish, Rose Street, Bideford Lane, Bideford, Devon. Details: Mr T. Butler, 41-43 Canon Street, Bideford, Devon, TD9 6UE.

26th April. **COVENTRY POOL & AQUARIUM SOCIETY** Open Show. Further details (L&E) from Mr S. Woodcock, 14 Ridgeway Avenue, Coventry, CV7 5JF.

26th May. **OSRAM AS** Open Show, Beaumont, Scarra, Refuge Street, Scarra, in Chalfont, Luton.

27th May. **SOUTHEND, LEIGH & DAB** Open Show, St Clements Hall, Leigh-

ton-Sea, Essex. Club and individual members, sponsors and major donors. Secretary: Mr D. Durrant, 172 Trinity Road, Southend-on-Sea, Essex; phone 842976.

16th May. **GLOUCESTER AS** Open Show, Education and Leisure Centre, Paternock Road, Gloucester, Gloucestershire (February); Mr R. Walker, 41 Hulse Road, Gloucester.

17th May. **MERSEYSIDE AS** Open Show. Venue to be announced.

16th May. **YEovil & DAS** Open Show. (Details later.)

19th-27th May. **MID-SHREX AS** Fish Exhibition, The Park Centre, Thompson Hill, Swasey, Northampton. 27th May. Open to public, 26th-27th May. 3-6p.m. for the family—entertainments include the famous Crab Derby.

26th May. **BRIDGINGTON & DAS** first Open Show, Alexandra Hotel, Redington, E. Yorks. Details to follow.

26th May. **CORRY & DAS** Open Show, Corry Civic Centre. Details to follow.

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

1st June. **GSGB General Meeting**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

2nd June. **BRITISH CICHLID ASSOCIATION** (Northants Area). Show for cichlids only. Further details to follow.

2nd June. **SUDBURY AS** Open Show, St Andrew's Hall, Sudbury, Warricks, Middlesex. Details: Mr L. Beaman, 10 Gessway Way, Keston, Middlesex (phone) 47-224 2374.

8th June. **LLANTWY MAJOR AS** 200th Anniversary Open Show, The Town Hall, Llanrwst Major, Belper, Derbyshire. Details for all classes. Secretary: Mr J. J. Edwards, Glanford, Mill Park, Llanrwst, Derbyshire, G17 5DB.

8th June. **HAVANT & DAS** 27th Open Show, St George's Hall, Waterlooville, Southampton. Mr V. E. Hunt, Coughton, 122 London Road, Wallis, nr. Portsmouth, Hants, PO7 1E9.

9th June. **LINGDEN & DAS** Open Show. Venue to be announced. Details: Mr S. Hill, 74 Hurley Street, Lincoln.

9th June. **BRIGHTON & SOUTHERN AS** Open Show & Exhibition, St Barnabas Church Hall, Beckwith Road, Hove.

17th June. **SWILLINGTON AS** Open Show, John Beaman School, Barkick Road, Swarth, Leeds.

16th June. **SALISBURY & DAS** Open Show, The City Hall, Fisherton Street, Salisbury. Details to follow.

17th June. **BISHOP CLEEVE AS** Open Show. Details to follow.

17th June. **ALFRETON & DAS** Open Show, Education Centre, Alfreton Hall, Alfreton. Details: Mr R. Hocking, Parkview, 13 Coppice Drive, Eastwood, Nottingham; phone Langley Mill 4104.

16th June. **HIGH WYCOMBE AS** Open Show, Low End Hall, High Wycombe, Bucks. Details: Mr R. Leslie, 22 Meadow Walk, Tyler's Green, Bucks. HP22 8DG; phone Fern 4386.

17th July. **GSGB General Meeting**, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

4th August. **TONBRIDGE & DAS** Open Show. Details: Mr I. T. Mathison, 22 Neptune Way, Five Oak Green, Tonbridge, Kent.

11th August. **GRIMSBY & CLEETHORPES AS** 2nd Open Show, Memorial Hall, Cleethorpes, Scunthorpe later.

18th August. **STROUD & DAS** Open Show, Strood Subscription Rooms. Details: Mrs D. Cole, Arington, The Hill, Banbrook, Strood, Glos.

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

22nd September. **TORRAY AS**, Open Show, Torrey Town Hall.

22th September. **HUCKNALL & BULWELL AS** Open Show. Details to follow.

19th-27th October. **THE AQUARIUM SHOW '74**, at the Royal Horticultural Society's Old Hall, Vincent Square, London S.W.1. Preserved by the Federation of British Aquatic Societies. Aquarist societies fishkeeping exhibits invited. Details from the Organiser, 998, 714 Grosvenor Lane, London SW17 0NY (91-947 4963).

27th October. **DONCASTER & DAS** Open Show, Broadworth, Mount Wollie, William Road, Woodhouse.

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

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### REPTILES

**REPTILES, AMPHIBIANS.** Free list. J. & D. Naturalists, 31 Sandy Road, Seaforth, Liverpool, 21.

### BOOKS

**MARINE HOBBYIST NEWS.** International monthly newspaper. Articles for beginner, advanced and professional aquarist. 1 year, 12 issues, \$6.00. Marine Hobbyist News, 205 Orr Drive Normal, Illinois 61761, USA.

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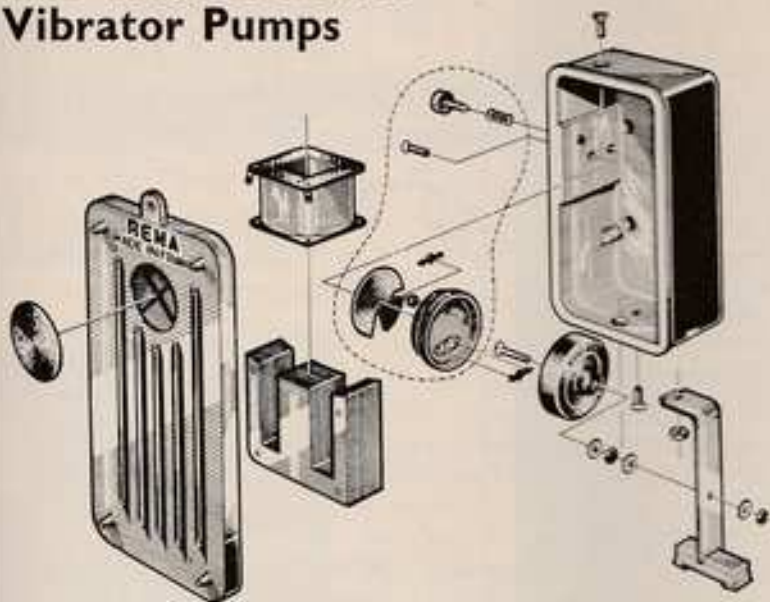
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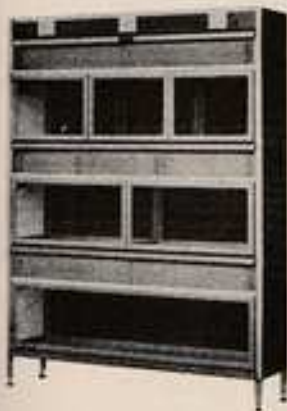


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