

FEBRUARY 1976

20p

Pet **Fish**

# PRACTICAL FISHKEEPING MONTHLY



Contents include:

Breeding the Fireglow Barb  
Coldwater Scenery  
Marinist's Notebook  
What's New?

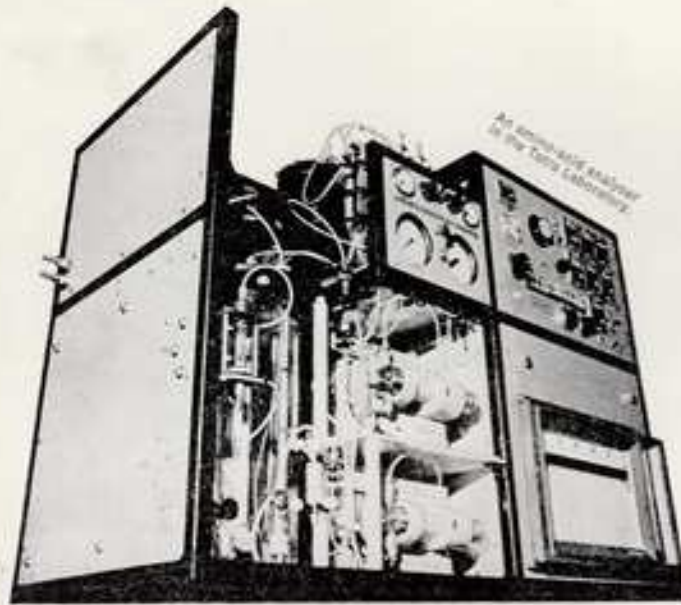
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## Comments and Quotes

- What happens to neglected varieties
- Example of inherited behaviour

### Keeping the Variety

NOT that fancy fish breeders require the reminder, but a recently published comment from the Poultry Rare Breeds Society showed what can happen very quickly to apparently well-established fancy varieties of animals — whether poultry, canaries, rabbits or fish. Unless there is devoted application to the variety by specialist breeders these strains die out. The breeder is battling against Nature — and time and patience are more likely to be stacked in Nature's favour. Certainly the list of extinct poultry breeds is now a very long one indeed. How are fish faring in this respect?

Perhaps the goldfish is the species coming first for consideration, as the forerunner of all sources of fancy fish breeds. Of course, a decision was taken to decrease the number of 'recognised' varieties of fancy goldfish by the Goldfish Society of Great Britain some years ago, a change of heart to include further varieties in the list subsequently taking place. It is not easy to be certain, but there are probably now fewer, rather than more, dedicated breeders keeping the varieties going in this country than there were, say, 20 years ago. The present-day breeders are without doubt better equipped and better informed than the breeders of yesteryear, but if they are a diminishing band some types of goldfish, never plentifully available, could be on a danger list as far

as U.K.-bred stocks are concerned.

On the other hand, we think that to some extent there has been a trend positively encouraging the disappearance of some of the more freakishly fancy forms — not only of goldfish but of guppies, too, and many will say that this is a good thing. There has been a change of opinion about and altered regard for some of these forms. However, those who are, in the idiom of today, 'turned on' by the quirks of fish genetics have to stick with the fancy varieties for only with these can the intricacies of patterns of inheritance be worked out.

As an example of the challenge beloved by the specialist, it was interesting to read in the latest Bulletin of the Goldfish Society of Great Britain an announcement by its editor, the well-known breeder Mr Roger Whittington, that he is hoping to establish a rare goldfish variety, the Jikin, he has received from Japan — the first to be imported into the U.K. His notes show the problems he faces — the Jikin's unusual caudal fin turns up in only 1-2% of fry from a good strain and the colour pattern is correct in less than 0.05%! At least the Jikin would appear not to be a potential threat to 'established' varieties for a breeding season or two!

### Inherited Cannibalism

WHETHER or not one livebearing tropical fish species will eat its young appears to be con-



trolled by inheritance. Work with the livebearer genus *Poeciliopsis* by Dr Roger E. Thibault at the University of Connecticut has revealed that *P. monacha* females are cannibalistic whereas *P. lucida* females are not, and that this event is determined genetically, a first-time demonstration that such behaviour is heritable. For the guppy the occurrence of cannibalism has previously been the subject of a hypothesis that when numbers of this fish are allowed to increase in a

tank there develops a chemical stimulus in the water that makes the parents more prone to eat their young. But in the work on *Poeciliopsis* that has been reported in the scientific journal *NATURE* this type of stimulus did not operate.

The genetic character of the cannibalism was revealed by discriminating species-crossing (hybridising) tests with the two species. Although cannibalism can be viewed as a means of regulating the size of the fish population, any other

advantage to the species that could provide a reason for its existence can only be speculated about. However, since in species of *Poeciliopsis* the phenomenon of superfoetation occurs, in which several broods at different stages can be developing in the livebearer's ovary at any one time, Dr Thibault suggests that 'cannibalism appears to be tolerated in the evolution of natural populations when superfoetation is present as a reproductive strategy'.



## LETTERS



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

### Unusual Livebearer

WITH reference to Mr D. Cheswright's letter (PFM, November 1974), I would like to raise a few points concerning *Pseudoxiphophorus bimaculatus*. I acquired my initial stock from Mr Preston over 2½ years ago, and have had considerable success in breeding and raising these interesting livebearers, now concentrating on rearing my second-generation-removed wild stock.

I would disagree with the sizes quoted for the sexes by Mr Cheswright, and I believe that 3½ inches for females and 2½ inches for males would be more accurate.

It is not a prolific species, with an average brood of about 15-20, and, peculiarly, only one male per brood sexing out (in my experience). They are not ideally suited to community aquaria, but successive generations may prove to lose their aggressive characteristics; but nonetheless, a very attractive and appealing species.

Harlow, Essex.

STEVE JORDAN  
Harlow AS

I REFER to Mr S. Jordan's reply concerning my comments on the two-spot livebearer (*Pseudoxiphophorus bimaculatus*). I must congratulate him on achieving second generation removed from the wild

stock. I feel, however, that the small numbers of fry quoted are due to the female eating its young and/or the female being on the young side; from wild stock I have had broods exceeding 100. With the next generation I have had premature births (all dead) of from 40 to 50 fry; the only success with this generation has been a brood of 13 born on 30th December 1974 to a half-grown female. Many premature births have been reported to me, even from the wild stock, and it seems that something is missing in our aquarium conditions — could it be the wrong type of foods? The point is that this fish is predatory and, being unsuitable for keeping with small species, would most likely devour its own fry with relish. From the figures above it is as prolific as other livebearers.

The sizes quoted by me were of the wild stock (female) and from home-bred stock (male). I have found about a 60:40 ratio of males to females. Many males do not sex out until over 2 inches long and they appear to grow larger than the wild males. Similar premature and dead births have occurred with a *Gambusia* species brought from the wild by Mr Preston.

Wickford, Essex

D. M. CHESWRIGHT  
Southend, Leigh & DAS

More Letters on page 477

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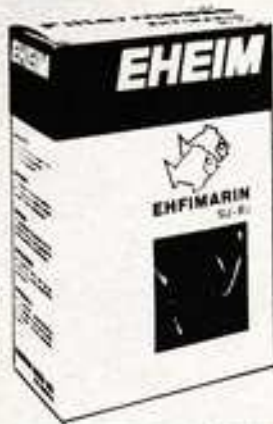
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# LETTERS

continued from page 470

## Newcomer to Marines

HAVING kept freshwater tropicals for a number of years, I decided to venture into the more difficult aspect of tropical marines. I bought a few books and found that there are three types of systems to keep marines, namely natural, semi-natural and clinical. I decided to try the semi-natural system and proceeded to set up my 36 in. by 12 in. by 15 in. cabinet-style tank. First, I washed out the tank with clean warm water. I then lowered the undergravel filter-plate into the tank and covered this with a 1 in. layer of crushed shell. A 1 in. layer of white silica gravel covered this, and finally a 1 in. layer of very fine particles of crushed shell on top of all. I filled the tank, using the old cup-saucer method so as not to disturb the gravel. After connecting the air-line to each of the air pumps (one pump to each air lift), I filtered the fresh water through the gravel before adding the synthetic salts.

With the specific gravity at 1.020 and the water temperature at 75°F, I added some large pieces of coral (after bleaching them) and arranged them to simulate a coral reef. After 2 days I added a brilliantly coloured fire clown and two electric blue damselfish and used these to cultivate the vital bacteria in the filter-gravel. I dosed these fish with medication when the nitrite level was high. The fish settled down and took all the foods I offered, being dried brine shrimp, tubifex worms and live brine shrimp, daphnia and glassworm.

For lighting I use a 30-watt tube, normal white, and algae are already growing on the back, front and sides of the tank; the coral is quickly becoming covered as well. I know that some aquarists don't seem to tolerate algae, but on the other hand I think in marine aquaria it helps to stabilise the pH of the seawater and provides a natural food for the fish. Almost all the

tangs and surgeons, and also some of the angels, must have algae in their diet.

Recently I have introduced three new fishes into my tank. They are all butterfly fish: sunburst butterfly, two-tone butterfly and the brown butterfly. The first two started feeding almost at once, but the brown refused for a while. I am relieved to say it has now started showing signs of interest and is pecking away at foods on the bottom of the tank.

Would any other aquarist interested in marines like to write to me and exchange ideas and experiences?

20 Berwick Drive,  
Fulwood, Preston, Lancs.

A. J. MADDOCK

## Cons and Feds

REGARDING Mr M. Strange's letter in your current issue criticising the attitude of the FNAS officials at the British Aquarists' Festival at Belle Vue, I think most people will not be surprised, in view of the shortsighted and intolerant attitude that was adopted towards Mr Strange's own club and that club's exhibit. Making the society take down all reference to the FBAS on their stand is not likely to foster good relations, nor is it likely to increase participation from clubs travelling the distance they did.

These are enthusiastic and dedicated aquarists who should be encouraged, not discriminated against. They have put on really excellent displays at Manchester these last few years and are entitled to membership in whatever parent organisation they wish.

Gilstead, Bingley, Yorks. P. W. COLES

We regret that recent issues of PETFISH MONTHLY have been published later in the month than is usual, owing to production difficulties. We hope that future issues will be appearing on the scheduled dates and apologise to our distributors and readers for past inconvenience.



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## MARINIST'S Notebook

---

By ROY PINKS

OVER a period of years I viewed with some horror the condition of pufferfish which appeared from time to time in local dealers' tanks. It was usual to house these little creatures in tanks containing also fish such as Malayan angels and sea-t, and combinations like this under crowded circumstances brought out the worst in each of these very attractive species.

It is true that most dealers find it difficult to maintain permanent tanks with the right water conditions for each fish they stock, and those who provide brackish water for those which thrive in this medium naturally try to economise in the space so dedicated. I often felt, though, that this policy was mistaken if it meant that the fish were overcrowded to the point at which aggression was encouraged by the crude nature of the environment. The result, as often as not, was that many fish sustained injuries to both body and fin, and that those already in a state of shock or exhaustion after transit were hastened towards untimely death.

It seems that importers have come to realise that it pays off to house fish in separate tanks, species by species, and it has scarcely yielded better dividends, to the viewer, at any rate, than in the case of the hitherto outraged brackish species. In uncrowded conditions these fishes will live quite agreeably together, though it is true that individuals will sometimes react badly and unpredictably and a little trial and error may become necessary.

The pufferfish group, perhaps because the species are rather odd-looking, often gets bad publicity because it also lacks adherents with real experience of all the possibilities. I hope that now that we are getting a chance of seeing such fish in their normal splendour more aquarists will try them out.

Many would-be purchasers are discouraged from buying them because they do not really understand the real significance of the water conditions. I stand to be corrected, but there seems to be some evidence that if ever a fish was tolerant about

this aspect, it may be found in the Tetraodontidae group. Members of the group are found in fresh water, in brackish water and in salt water, and it seems not unduly difficult to effect the transition from one of these to another, given that the conditioning is gradual. In theory there is no reason why any member should not be trained through these stages, kindly and intelligently, but I cannot guarantee that every individual fish will react favourably.

It may be noted that Günther Sterba lists *Tetraodon schoutedeni* as a purely fresh-water species and *T. fluviatilis* as amenable to both fresh and brackish water; I am fairly sure that I have seen the former doing reasonably well in brackish water, and I certainly have one of the latter in one of my normal marine tanks. I do not think that it is out of place to experiment with these fish, provided that the changes are applied gradually. If the fish are first got into superb condition in the water they are used to and then subjected to regulation they will be less likely to suffer from any over-exposure they may encounter. In any case it is not difficult to reverse a gradual process if individual specimens do show adverse signs.

Nearly all the species available are attractive, but *T. fluviatilis* and *T. palembangensis* are especially so, as in both fish the iridescence, which is such a feature of the group, comes into particular prominence. It is pretty poor taste to buy these fish in order to compel them to puff themselves up. Instead, buy them with a view to treating them as rather special pets which can be trained to recognise their owner and to accept food from his (not too near) hand. I have one at present in this category and my daughter is devoted to it: it is certainly a personality, and as it is now in its third year with us it has indeed be-

come something rather more than just another long-lived fish. Longevity was scarcely an attribute of aquarium specimens of these species in years past, and perhaps with greater understanding of them we shall manage to do better in the future.

My particular pufferfish has overcome worse tank conditions than I normally allow. This arose because it was in a tank which I was running down, and it ultimately became the sole inhabitant. When the state of neglect became intolerable I decided to transfer this fish to marine conditions, and it didn't even 'turn a hair' after a 48-hour 'decompression chamber' type of transfer. It is now in the company of an aggressive yellowtail damsel, a tomato clown, a domino and two tiny dusky damsels. It is peaceful in most things at present and takes a certain amount of punishment from the former (the boss) fish. In this it is not alone!

Feeding has never been any problem and it seems to relish the larger flaked food, which it crunches so loudly that it sounds like my small son disposing of his breakfast cornflakes; by contrast it eats almost anything without protest, and I have to keep my fingertips out of the way at meal-times, as I don't altogether trust the strong 'beak' it uses to crush its intake. It is simply compatibility which makes a collection of puffers something of a challenge, but I sometimes think that this sort of risk is exaggerated. Marinists know full well that if they believed everything they read they would only have a single specimen fish in each tank, so aggressive are the true marines. Of course, it usually turns out that communities can be built up quite satisfactorily by applying normal selection skills, so I hope that some readers will try to develop this group. I saw some absolutely glorious specimens of the striped puffer (or 'figure of eight') on sale at 75p recently, and they compared very favourably indeed with many marines at ten times this figure.

★ ★ ★

The ardent marinist will speak at length about almost every aspect of his fish — their extraordinary colouring, shape and habits, to say nothing of their size and rarity, but when it comes to longevity there is a rather awful silence. I cannot quite fathom why collectors of tropical

marines will persist in going from one expensive failure to another without so much as a look towards the possible causes of their difficulties. It seems to be an occupational hazard, and I have experienced it myself: for a time one seems blind to all the possible perils and many quite avoidable deaths are occasioned because of an incurable optimism which infects us in the early days of our marine fishkeeping.

In large measure I think we are misled by the behaviour of the 'starter fish' which we introduce to our systems. If we are honest many of us must confess that it was the greatest possible surprise to see our first marines surviving for more than a week or so, and on the strength of this we allowed ourselves to be persuaded that once the tank seasoning period was past, all was plain sailing. As we all now know, we select the hardest species as starter fish, and it is only because they are tough that they get away with the abuse to which they are usually subjected. It is quite wrong to assume that other species of salt-water fishes will necessarily react similarly, but all too often we do just this. To make matters worse, the odd specimen of a normally touchy species will sometimes thrive in conditions which would deter others, and the fishkeeper will be misled, perhaps expensively.

I have been analysing some back numbers of the monthly bulletin of the British Marine Aquarists' Association in an

Species	Individual life-spans (years and months)			
<i>Acanthurus leucosternon</i>	.1	.1		
<i>Amphiprion percula</i>	2.1	1.0	0.1	0.1
<i>Amphiprion ephippium</i>	1.6			
<i>Balistapus</i> sp.	1.0			
<i>Centropyge bispinosus</i>	.5			
<i>Chaetodon collaris</i>	.2			
<i>Chaetodon mesoluceus</i>	.5			
<i>Chaetodon vagabundus</i>	.1			
<i>Chelmon rostratus</i>	2	1.0		
<i>Coris formosa</i>	.10			
<i>Dascyllus trimaculatus</i>	.1	.1		
<i>Holocanthus tricolor</i>	.5			
<i>Macropharyngodon meleagris</i>	1.2			
<i>Plectrolychnus orientalis</i>	.2			
<i>Plectrolychnus chaetodonoides</i>	.1	.1	.9	
<i>Pomacanthus annularis</i>	.9			
<i>Premnas biaculeatus</i>	1.6	1.0		
<i>Pterois volitans</i>	1.9	2.6		
<i>Synchiropus splendidus</i>	1.6			
<i>Tetraodon lineatus</i>	1.5			
<i>Thalassoma</i> sp.	.1			
<i>Zanclus cornatus</i>	.8	.4		



endeavour to assess the life-spans of specimens of fish belonging to members, and the list that emerged is shown.

It is important that this list should not be taken out of context, but on the other hand it is so difficult to persuade aquarists to provide statistical information that one is often driven to subsist on such skeletal fare as this — or to perish. The life-spans noted related very largely to fish kept by beginners in their first year or so in the hobby, and there was hardly any information (as seems obvious) from more experienced aquarists — I can hardly accept that the higher figures quoted ranked as some of the better performances. In a way this is odd. In most walks of life those who write to magazines about their interests show off about their achievements, but it would seem that in marine fishkeeping we all indulge in an orgy of confession of our failures.

If typical, the table of life-spans is a pretty shocking condemnation of tropical marine fishkeeping, and no-one would deny that in the early stages we have come to accept that the wastage rate is fairly high. That it actually need be so is another matter, and there are marinists who would claim to have suffered hardly any losses at

all. I think they would prove to be the cautious and careful members of our hobby, and many of us would do well to take a leaf out of their books. In practice, however, I believe that marinists who have weathered the rather awful disappointments of their first 2 years — and who have persevered nevertheless — manage to achieve survival figures well in excess of the examples quoted, and I hope that we shall soon have adequate proof of this. At the other end of the scale there are marinists who aver that the cult is no more difficult than freshwater tropicals.

It will be noted that *Z. cornutus* features at the end of my list. The figures were not impressive, but I have just found some details about the keeping of these fish by Mr Keith Hobbley, who was kind enough to write to me some time ago about this wonderful fish, and was optimistic about developing a way with it. I hope that those who have managed to keep tropical marinists consistently for 3 years or more will be encouraged to write some commentary on their success — it may well be that if enough respond we may detect some thread, however fine, which will lead us to greater all-round effectiveness in our culture methods.

## What's New?

### Power Converter

THE new Tower Power Converter has a 500 watt capacity at 230 volts. This miniature AC converter provides emergency power for approximately 3 hours at a time and is only 6½ in. by 9 in. by 4 in. in size. Finished in matt black, the model operates by connection to two ordinary 12-volt car batteries; it is air-cooled and the manufacturers state that it is almost silent in operation. It is supplied complete with jump-leads

for connection to the batteries at a retail price of £80 plus VAT. Recharging the batteries is achieved when mains power is restored by plugging in the cable at the back of the converter to a mains supply socket, setting the switch to 'charge', and leaving overnight. For further information contact Mr E. M. Grice, Tower Plus Components Ltd., Morley Road, Tonbridge, Kent TN9 1RA; phone Tonbridge 67635.

### Foods in Variety

THE new range of Season Freeze-dried Aquarium Fish Foods being marketed by Fantasy Pet Products Ltd (13 Nutley Lane, Reigate, Surrey RH2 9HR) makes a most delectable addition to the diet of any tank inhabitants. So far available are River Shrimp, White Shrimp, Mysis Shrimp,

Mini Shrimp, Mosquito Larvae and Tubifex Worms. They are packaged in uniform-sized clear plastic drums with flexible white plastic screw lids; and in order to make life easier both for the customer and the retailer they are a one-price range, with a suggested retail price of 30p including VAT. The freeze-dried material comes from Taipei, Taiwan and is clearly visible in the containers as freeze-dried whole material whether it be white or river shrimp or mosquito larvae. The guaranteed minimum crude protein analysis and weight of material in the containers is as follows: Tubifex worms, 5 g., 57.25%; river shrimp, 5 g., 71.75%; mini shrimp, 8 g., 46.31%; mysis shrimp, 5 g., 46.31%; mosquito larvae, 8 g., 55%; white shrimp, 5 g., 57%. Suitable for tropical freshwater, goldfish and marine fishes, the foods in this range supply a happy variety to enliven any fish's diet.



## Book REVIEW

**THE LIVING SEASHORE** by Joan M. Clayton.  
204 pages, 32 plates, over 80 line drawings.  
Frederick Warne, London and New York. 1974. £6

**T**HIS book has two main parts, the first being concerned with the characteristics of the seashore, and the second with the fauna associated with it. Part One is something of an excursion to the various types of shore we may encounter around the British Isles, and in the most unstuffy style possible the author ranges from the basics of tides and zonation to the catching of prawns with a bicycle wheel. She sketches in some detail the way in which animal and plant species have adapted to life at the edge of the sea, and has clearly shown the characteristics of the discrete zones into which the seashore itself is subdivided. There is the right emphasis on the need to collect specimens in a responsible fashion, which includes consideration of the mutual compatibility of the available species. The short section on aquaria is adequate but lacks the balance one would have hoped for. Few marine aquarists these days would think of setting up any tank without a subgravel filter, which simply gets a passing mention. It is, of course, an absolute basic and its use would circumvent some of the pitfalls mentioned.

Part Two consists of detailed discussion of the seashore fauna, together with adequate notes on the structure, locomotion, feeding, reproduction etc. of the species mentioned. Some very fine line drawings support this part of the book, and two collections of both monochrome and colour plates complement the presentation.

Somehow the writer has managed to pitch her argument at several levels without losing fluency at any of them. The student, the traveller, the holidaymaker and the aquarist will all find much satisfying material, and the conservationist, too, will also note with some pleasure, that rostrerity has not been overlooked. Even the general reader will be beguiled by the style which so easily isolates some of the fundamental peculiarities of the way of marine life, and which gets the message

across. The stark facts shown by the food chain pyramid of numbers, the picture of the infinitely varying nature of the plankton, and the painstaking analysis of the various types of seashore we may visit, are examples of subjects which will make the general reader read on, not only to the end of the book, but to the copious bibliography which concludes it. Having reached this point it becomes clear that this is a good reference book, too.

Measuring some 6 by 9 inches, this book is mercifully far more easily portable than many other prestige publications which have virtually no practical appeal. Its binding, paper quality and the proof reading are impeccable. I am, however, totally baffled by the decision of the publishers to market this at such a high price. I have always understood that the price of a book is related to its estimated selling power, and yet in this case the UK market for the book must have been widened very considerably by the bursting of the foreign holiday bubble, which will mean that millions will have to put up with holidays at home for some years to come.

Roy Pinks

**TROPICAL MARINE INVERTEBRATES OF SOUTHERN FLORIDA AND THE BAHAMA ISLANDS**  
by Warren Zeiler. 132 pages, 248 colour photographs. John Wiley and Sons, New York and London. 1974.  
£10.75.

AS admitted by the author in so many words, "this is definitely not a 'how to do it' book". His publishers will certainly be asked for such a book, however, since there is no doubt that this present work well and truly achieves the author's purpose — "to stimulate interest and action". The beautiful colour pictures of gorgeous marine polyps, flatworms, polychaetes, molluscs, crustaceans and echinoderms that occupy the book's pages cannot do other than excite the mariner and cause him to scream for more information about how the animals can be kept.

In the main the text is little more than captions to the photographs — interesting notes on names, occurrence, habits and, less frequently, an indication of the specimen's suitability for aquarium life. However, in the Introduction a cautionary note, and a refreshingly honest one, is given in the statement that keeping these animals



alive (truly live, that is, and not merely "holding them for a time until they die of starvation or other causes") is no easy matter in closed-system aquaria and not without problems for ocean-side installations on the open system. Feeding is still a major difficulty with many of the invertebrates under aquarium conditions.

Warren Zeiller, who is managing curator and a director of the Miami Seaquarium, acknowledges that the hobbyist can con-

tribute as much as anyone to knowledge of these animals' requirements, so that enthusiasts who are prepared to experiment and never give up the search for what is needed for success with any particular specimen, who believe they can devote the necessary time and effort, need not be put off. Mr Zeiller's book gives an exciting glimpse of the rewards there could be.

A.E.

## Marine Aquarium Cleaner Shrimp

By W. A. TOMEY

Photographs by the author

AS interest in keeping marine aquaria increases, importation of many species of animals that live in tropical seas also improves. In fact, it is the lower animals that often catch the attention of the public rather than the coral fishes themselves. This is not only because of the attractive colours that these animals exhibit but because of the strange shapes and extremely interesting behaviour of this extensive group, in which the Crustacea, among many others, are included.

The hobbyist's interest is caught at the sight of the many mobile appendages — legs, pincers, feelers, filaments and brushes — which are so characteristic of many crustaceans. Most of these protuberances have several functions and make all sorts of mysterious movements, the reasons for which we do not understand, but are almost certainly directly concerned with locomotion, respiration and feeding.

There are many crustaceans that live in holes or deep down and that are concealed during the day and move about at night; others are active during daylight and live on the reefs, while yet others live in symbiosis with animals of a different kind. Among the latter we encounter *Stenopus hispidus* — a most beautiful animal in shape and colour and one that presents a most interesting way of life. I was quite surprised to find some of these

magnificent banded coral shrimps in Rotterdam amid a considerable collection of tropical marine invertebrates that had been brought in by a fish importer.

*Stenopus hispidus* comes from the Indo-Pacific area, from the Red Sea and South Africa round to Hawaii and the Tuamotu Islands, and they are encountered in the western Atlantic from Bermuda and South Florida to the northern coasts of South America. The shrimps are also very common in the Bahamas, Puerto Rico and the Virgin Islands. I do not myself know of any reports of their presence in the eastern Pacific and eastern Atlantic oceans.

It is a beautiful and quite large cleaner shrimp with long, slender legs up to 3 inches (7.5 cm.) in length. The body and legs are brilliant white with dark red bands and in the adult shrimp the base of the leg is bright blue. The eyes vary in colour from brown to golden brown and are almost unstalked; the feelers are much longer than the body and bright white in colour. The body is rather 'hairy' and the long legs are spiny.

Their vivid colours form a brilliant contrast with the rather darker backgrounds of the coral reefs or the back panel of the aquarium. The shrimps prefer to live under an inclined or propped-up stone, where they hang from the 'ceiling'. The red colour of the body hardly shows up in such a



The cleaner shrimp (*Stenopus hispidus*) takes up a vantage point on an algal frond in the aquarium.

milieu, just as the bright white of the continuously moving feelers fades in the sunshine as the shrimp itself remains concealed under the stone or in the fissure.

*Stenopus hispidus* may be the largest of all the cleaner shrimps known to us; in their natural habitat they live in a very limited area and neither the adults nor

the youngsters move beyond a radius of 20 inches, except when they are disturbed. In fact, they remain for months, maybe even years, in the same area of less than a square yard. A remarkable thing is that the pairs try to remain together even when they are disturbed — behaviour which can also be seen in the aquarium.





Magnified view of a cleaner shrimp larva born in the author's aquarium (actual overall length of the larva was 3 millimetres)

I have now had quite some experience of *Stenopus hispidus* and I think that I can say they are ideal aquarium pets — beautiful in colour and shape, not dainty in their food requirements and prepared to live in a small space.

Taking due note of the warnings in an article in the Dutch periodical *HEE AQUARIUM* by Mr Frank de Graaf about the sensitivity of most lower animals to variations in water composition, salinity, oxygenation and to transportation, my pair of adult *Stenopus* was introduced into one of my marine tanks only after the most careful acclimatisation. The all-glass tank was put together with silicone rubber sealant, with a plastic back panel attached; it was 26 in. by 16 in. by 14 in. Strong aeration gave plenty of water movement and I put a small box filter filled with charcoal in the tank. The bottom was composed of a 2 in. layer of coral sand and there was abundant light for the rich

growth of algae and *Caulerpa prolifera*. The temperature was about 72°F (22°C). Clean water from the North Sea coast was used, plus some made up with a small quantity of artificial (hw) sea salt. The tank's population consisted of two adult seahorses (*Hippocampus kuda*), three harlequin shrimps (*Hymenocera picta*), some anemones (*Actinia equina*), some very small red-blue hermit crabs of an unknown species and two edible periwinkles to clean all the detritus and algae from the tank. As you can see, a fairly sparse population to which my cleaner shrimps could easily be added.

As soon as they were released into the tank the *Stenopus*, those inhabitants of holes in their natural home, began to investigate the back plastic panel against which some stones formed a natural cavern into which they could withdraw themselves. The animals obviously felt better in and near these holes but this does not mean that they were therefore inactive. On the contrary, my cleaners made a number of reconnaissances through the entire tank and moved about the back panel quite a lot, sometimes balancing on their tall, thin, transparent legs and continually stirring their white feelers.

As do some other shrimps, the cleaner shrimp ministers to all sorts of reef fishes and the latter are stripped of skin parasites and dead tissue in the proximity of wounds. All of these items are eaten by the cleaner shrimp. This cleaning process is thus closely related to its food requirements and the shrimp is, of course, specially adapted to performing this task. In my tank, as I have indicated, suitable fish were missing; the small seahorses have such hard skin that even parasites could not get a footing on it and I could not see that they were cleaned. But this presented feeding problems and I wondered what I should do.

I had noticed that when I carefully fed the anemones with small quantities of fresh mussel flesh the *Stenopus* were then particularly active and continually waved their white feelers. Like most crustaceans, cleaner shrimps are very sensitive to impressions of taste and smell which are probably given by infinitely delicate organs in the feelers. So I started to feed my shrimps with mussel flesh cut very fine and with the flesh of periwinkles, though this they obviously disliked and accepted

only reluctantly in spite of being hungry. But when I fed with brine shrimps (*Artemia*) the shrimps' interest was roused and I could observe how they tried to catch the little 'food shrimps' with rapid movements of their catching legs.

These 'catching' legs obviously have a double design. They are provided with a series of small, stiff hairs which can touch a fish's skin without damaging it and, since they are so sensitive, help in detecting small parasites. If fish and parasites are missing, however, *Stenopus* will remain alive by using these catching legs, with their hair screen, in rapid movement to catch small food animals that live in the water.

Feeding with white midge larvae (*Corethra plumicornis*) enables us to see how quickly and precisely the shrimps can catch them and carry them up to their mouths with their pincers (sometimes using the water current to assist in this). To my surprise I have found that white midge larvae remain alive in sea water without any difficulty though they become considerably smaller with the change from fresh to salt water. The advantages of this are many. The water is not polluted by the presence of quick-dying mosquito larvae and the animals in the tank enjoy hunting for live prey. But as with all food, it is better to feed sparingly but often. The rich plankton of the North Sea coasts also gives an abundant supply of live food for *Stenopus*.

After about a month my cleaner shrimps were eating small tubifex, provided the worms were gently brought within reach by means of a plant fork or with tweezers. They are also interested in the young guppies I supply as food for the seahorses, and I have noticed on several occasions that the anemones are not entirely safe from the shrimps. I saw a *Stenopus* female carefully approach the anemone, take a firm stand and reach out with its little claws to a tentacle, which it caught just under the tip, drew it toward it and munched it, all the while taking care to remain out of reach of the rest of the anemone! Generally speaking cleaner shrimps have few enemies, although they come into almost daily contact with crab-eating fishes! Observations made in 1960, however, have established that *Stenopus hispidus* are not entirely without enemies as two complete remainders of this shrimp

were found in the stomach of a *Epinephelus merra* (rock cod).

If conditions are right the animals will even reproduce in the aquarium. I did not observe how the actual mating process or reproductive behaviour was carried out but I found that the female was carrying eggs. Possibly there is some relation between shell-change and reproduction because the eggs appear most often shortly after the shrimp has cast its 'old clothes'. As with most shrimps, the space beneath the abdomen forms the breeding cavity, in which a great number of tiny eggs can be carried while they are developing. The thin, hairy and mobile swimming legs close the space from below and the swimming movements create a stream of well oxygenated water that can enter the brood chamber. It is not quite clear to me whether water temperature influences the time of incubation; reports from different hobbyists give divergent information on this point.



The large defensive pincers of the cleaner shrimp and (to the right) the jaws or mandibles (magnified views)



The eggs of *Stenopus hispidus* are bright white shortly after they appear and extraordinarily small, so that a great number can be carried under the abdomen. I estimated the number of eggs being carried by my female to be about 800! Hatching requires 16 days and as the development inside advances, the eggs become more and more transparent and the eyes of the larvae can be clearly seen, sometimes even through the wall of the breeding cavity. During this time the *Stenopus* female is particularly active and continually caring for the eggs, which are held together by a tough but invisible substance. This substance dissolves when the larvae come out and reach the surrounding water. Largely by the aid of the second and third pairs of legs, which are provided with small pincers, the eggs are treated and turned and those that are unfertilised or damaged are expelled from the cavity, to be immediately eaten. In order to reach the depth of the breeding cavity the female has to stand vertically. This always makes a great impression on the spectator and the wonderment is enhanced by the incredible flexibility of the legs.

I had never been able to distinguish young crustaceans in my aquarium because most of the time the eggs were eaten by the female long before they hatched. I was therefore completely taken by surprise when a friend remarked on the 'jumping splinters' in my marine tank, which, on closer inspection, turned out to be hundreds of *Stenopus hispidus* larvae! They jumped in the water like cyclops, staying chiefly on the bottom and close to the panes of glass. These larvae were about 3 mm. long including the feelers and they lived for about 2 days. Some of them went into the filter and a bigger proportion served as a banquet for the seahorses. At first I thought that the female had let all the larvae out into the water but on further observation it seemed that she had kept a few of the completely developed eggs in her breeding cavity. Through the fairly transparent wall of the cavity the eyes of the larvae in the egg-membrane could be seen distinctly and these youngsters were only liberated 3 days after the first ones.

This phenomenon of the birth of the youngsters can also be observed in freshwater prawns and it raises some questions



Magnified views of food-catching appendages of the cleaner shrimp — food animals can be trapped on the comb-like structures

that can only be answered by detailed and continual observation of the live animals. Can the development of a small quantity of eggs be delayed deliberately and the youngsters be produced later? Is this connected with the maintenance of the species? Does it occur regularly in Nature as well as in captivity, or is it a consequence of captivity and the lack of natural conditions?

For lack of time I have not been able myself to undertake any further attempts at breeding, and it is probable that it would be condemned to failure by lack of adequate food. But it would be worth trying.

As *Stenopus hispidus*, the banded cleaner shrimp, naturally lives in a small area and is not difficult to feed, the mariculturist with the experimental turn of mind will find an interesting subject here. We await reports of the first successful breeding of *Stenopus hispidus* in the aquarium with interest.





## Personal COMMENT

by  
ARPEE

**A** BURNING topic of conversation around the country at the present moment is the question of how one can protect one's money (if one has any) from the ravages of inflation. Whilst the truthful and only practicable answer is that we should all work harder for less money, this is an unpopular notion, ergo it cannot be right, so the circle continues, viciously, to turn more sharply and more often. The pet keeper is, by nature, a bit of a spendthrift, but this is not to say that he remains unaffected by it all and that it is not possible to improve one's purchasing power by a certain amount of forethought.

There are some obvious ways of buying wisely, and first and foremost there are the advertising pages of PFM to guide us. But look closely at advertisements and compare the products and the prices asked for them: in the case of fish foods, consider very carefully whether you can afford *not* to buy the larger sizes, as bulk purchasing here can be very lucrative. Whilst it is poor economics to buy too large quantities, as deterioration may set in and render the food poisonous to fish, some of the dried foods last for surprisingly long periods. It may be found that you can buy the monster sizes and split the contents with your friends. At all events the tiny boxes are really not at all worthwhile for those with collections of more than one small tank.

When it comes to tanks it will be found that the cheap tank is a poor investment, and that something in the middle price range will probably pay off far better. In the top bracket there are some splendid aquaria, but they are simply prestige material, and unless this characteristic is what you want, the top price does not necessarily guarantee that the life of the article will be proportionately longer. Very serious consideration should certainly be

directed to the possibility of home-made aquaria, and here, again, is an opportunity for co-operative action, and clubs may well find that 'construction' evenings have some appeal for a proportion of their members. Some of us have no confidence in our ability to make bookshelves, let alone tanks, but a little encouragement from the handy-men works wonders, and the pooling of materials can often be so organised as to eliminate waste completely.

Some of the specialist plant nurseries market excellent collections of aquarium plants, which if purchased in large enough quantities can also be parcelled out amongst club members, or amongst smaller groups of organised buyers. A visit to these establishments will also enable the buyer to select plants which look most appealing. Inevitably, and with the best will in the world on the part of the nurseries, some species always look better at some times than others, and self-service virtually guarantees customer satisfaction. Once again, it will be found that buying of plants by units is not the best way of disposing of your money.

When it comes to fish, the average fish-keeper must accept that there is no such thing as a good investment. On the whole it is probably truer to say that some purchases are very considerably worse than others. The breeder is excepted from this sweeping generalisation: of course, he may be forgiven for spending the contents of his wallet on stock which he recognises as being of high potential. For most of us, though, it is just a matter of buying what we fancy whenever we can afford it. About eighty per cent of our buying, therefore, is going to show no return whatever excepting that of the sheer pleasure of keeping the species we favour. Certainly, some fishes live much longer than others and others, still, deteriorate badly with old age.

Given a wide choice of species at the present moment, then, what might prove to be the most sensible purchases? Fashion, it is true, will sometimes take us by surprise, but fishes I would now seek out are small specimens of the sharks and the botias. I saw some clown loaches recently — quite tiny, in fact, but they were only about 30p each. These are admittedly a somewhat capricious species, but in the right conditions they rapidly put on weight and size. Sharks are very much less tem-





"I want one that will be a good investment . . ."

peramental and fetch really high prices when they have reached adulthood. It is far from true that the cichlids follow the same pattern, and some become a positive embarrassment when they have grown up.

Although the turnover price is not quite comparable with that of the sharks, the adult tinfoil barbs are well worth the trouble (not that it amounts to much) to get them to this size, and if you have the space to accommodate them, the young fish are good candidates for your anti-inflation measures. Fish are probably the exception to recommendations for bulk buying, as, apart from the attendant risks it is a very inelegant and unsatisfying way of obtaining specimens, and I would always recommend that they should be subject to personal selection.



Every so often the members of hobby associations indulge in some form of self-examination. They question whether their published aims are what the majority want, they ask whether their membership is adequate in size or quality, and they attempt to look into the future to determine whether they are going to keep up with the tide of progress. A pungent letter appeared in a recent number of 'Marine', the bulletin of the British Marine Aquarists' Association, from P. J. Ireland, in

which he poses the question, *inter alia*, whether the BMAA is to be a body for the serious study of marine life or simply a glorified fish club. The question itself will take a lot of answering, but the fact that it has been asked at all is an indication of a growing conscience and of a concern for many matters which have either been ignored in the past or swept under the carpet because the answers might have been embarrassing to certain factions within the association.

Whilst the members of the BMAA will no doubt make their feelings known, the enquiry might well apply right across the hobby, and I wonder whether it would be a popular one? Superficially one must support any movement which results in the development of greater responsibility within a group, but it is vitally important that this should not create divisions within the group which might lead to its downfall. Thus one would hope that the BMAA would foster within its compass a group of specialists which would benefit the hobby as a whole. However, there may arise such member-apathy that those who are fired with interest and determination to exploit the byways may be driven into a form of isolation which they do not seek. It will be extremely interesting to note how this enterprise fares. It certainly acts as a stimulant to all who have an interest in the strategy of the hobby.

Such developments cause mere columnists like me to ponder yet again on the ever-important matter of the audience to whom the magazine is addressed. It is true that many readers will consider that the beginner is spoon-fed, whilst others will bemoan the fact that the articles are all too specialised. Others will think that the trade have too much of a say, and some businessmen will regret that I always seem to be on the side of the customer. The exhibitor is never satisfied that there are enough hints on how to win the big prizes, whilst the teenager with just one tank may claim that it is only the pot hunter we really bother about. Indeed the hobby covers a lot of ground, and there are innumerable facets of opinion and interest. It seems to me that, over a period, all these different sorts of readers have to be — and are — catered for in our pages, for they are the stuff of the hobby itself. Undue

Continued on page 408

## The Fish Called *Barbodes fasciatus* **Fireglow Barb**



*Barbodes fasciatus*

By S. FRANK and RUDOLPH ZUKAL

Photographs by RUDOLPH ZUKAL      Microphotographs by S. FRANK

Translated by F. MARSH

**I**N the belief that *Barbodes fasciatus* is known only to relatively few aquarists we offer this somewhat longer and rather more detailed article than usual to introduce this beautiful barb to the reader.

The first report on the care of this barb (known in German as Glühkohlenbarbe — the fireglow barb) came from the pen of Dr E. Schmidt, in an article entitled 'Die Glühkohlenbarbe (*Puntius melanymphyx*)' in the magazine TROPISCHE FISCH (1961, vol. 12, pp. 572-574). The fish was not

always correctly labelled and in some magazines the name was changed to the incorrect version *Puntius (Barbodes) fasciatus* (syn. *P. melanymphyx*).

From the description it would seem that the fish imported at that time were probably a somewhat differently coloured variety from those kept in the aquarium today, but the basic facts about their behaviour that Dr Schmidt supplied then are applicable, with the species being described as pugnacious, the female often



being attacked and killed by the male; the female laying a comparatively small number of large eggs, say 50-60 (exceptionally, the author of that paper reared 200 young fish). At spawning time the males turn fiery red; kept in captivity the largest specimens reach a size of 3 inches (8 cm.). These are the basic facts from the aquatic literature.

To learn more about *Barbodes fasciatus* we need to refer to some of the older ichthyological literature where some important statements are made, particularly about the correct designation of the species. To simplify matters we list the synonyms by which this fish has been described:

*Cirrhinus fasciatus* Jerdon (1849),  
*Madras Journal of Literature and  
Science*, p. 305 (not Bleeker 1853).

*Labeo melanampyx* Day (1865), *Proc.  
Zool.Soc.*, p. 298.

*Puntius melanampyx*, Day (1865),  
*FISHES OF MALABAR*, p. 210.

*Barbus melanampyx*, Day (1878-88),  
*FISHES OF INDIA*, vol. 1, pp. 570-571.

According to these authors this barb comes from the south-east part of north India (the hill ranges of Travancore); it reaches a length of 2½ inches (7.5 cm.), has four barbels and three bands (the first behind the eye, a broad second band from the base of the dorsal fin to the beginning of the ventral, and a third band from behind the base of the dorsal fin extending round the sides but not reaching the base of the anal fin). Sometimes there may be a fourth bar at the root of the caudal fin. The eye is red. D 3/8-9, A 2/5-7; lateral line 19-20, transverse line 4/3. The background colouring of the body is red-brown. The last, i.e. the fourth, undivided fin ray in the dorsal is pliable. The description of the colouring of the adult male must have conformed with the authors' experience. A dark diagonal band on a bright whitish gold ground is characteristic of young fish and of females outside spawning periods. In general, the young of both sexes have three bars (behind the eye, under the dorsal and at the root of the tail); older individuals of both sexes and females have five bars.

On the grounds of priority the correct name should be *Barbodes fasciatus* (Jerdon, 1849), the name *Barbus (Barbodes) fasciatus* (Bleeker, 1853) must be held to be a secondary homonym. How-

ever, the distinct species described by Bleeker remains, without the species name; *B. B. fasciatus* (Bleeker, 1853) should therefore really be described again under a new name. The available aquarist literature, however, identifies this species with *Barbus (Puntius) lineatus* (Duncker, 1904), though this cannot be held as a definite conclusion in view of the further morphological differences in the original descriptions of the two species mentioned, and also their various sub-genera. For these two distinct species here are just a few noticeable characteristics by means of which they can be distinguished from each other at first sight:

*Barbus (Barbodes) fasciatus* (Bleeker, 1853). Sumatra, Banka, Borneo. Reaches 4½ inches (12 cm.); has four barbels, six to seven horizontal stripes (one horizontal stripe in the middle of the back line); the body is flattened; background colouring is yellow-brown, belly silvery yellow; propagation in the aquarium unknown.

*Barbus (Puntius) lineatus* (Duncker, 1904). Malayan peninsula (Johore). Reaches length of 3¼ inches (10 cm.); without barbels; four to five horizontal stripes; deep head; background colouring olive green to yellow-grey; transparent, colourless fins though the dorsal and anal fins are reddish. A prolific breeder in the aquarium.

It is a maxim that there can be no practice without theory but all the same we turn back very happily to the main theme of our story — the practical breeding and rearing of *B. fasciatus* in the aquarium. The young fish we had received from friends in East Germany were kept in a community tank with various characins and barbs. The fish were about 10 weeks old and about 1½ inches long. Their background colour reminded one of the well-known five-banded barb (*Barbus pentazona*), only the bands were rather more intense. It was impossible to distinguish sex differences for a long time and it was not until they were 6-8 months old that the characteristic white fleck in the middle of the male's upper jaw could be distinguished. In the community tank there were fights between the rival males though the weaker fish came to no harm because they were able to hide from the dominant males in the plant thickets, but it was a different story in the smaller spawning tanks, where the chances of



In this picture and in the one on page 488 the lower fish is the male. During courtship display his colour darkens and the bars become broad flecks



escape were less. But more of that later.

Adult fish do not require water of any particular condition and mine did well in tap water (18° DH, pH 7) that had been left to stand and was then continuously filtered in the community tank. Regular tank cleaning and part renewal of the old water with fresh water warmed to the same temperature gave rise to noticeably

heightened activity in the fish (this is similar to the behaviour of the four-banded barb, which also does not much care for old, stale, water). The breeding preparations were carried out bearing all these points in mind — although these had to wait until not only could the males be recognised with certainty but until the females were 'full' enough.



Different phases in the male's courtship behaviour are shown on this page. The circling movements around the female (top of the page) are made with fins folded. Shortly before spawning the male gently lifts the female by pressure with his head (left)



To prepare for breeding, an all-glass tank (6-7 gallons, 30 litres) was used and filled with water from the tap. After this had stood for 3 days a tuft of myriophyllum was planted in the substrate and a piece of Java moss laid on the tank bottom. Stones were built up in a back corner so that the female should have somewhere to hide from the attacks of the male. The temperature was raised to 79°F (26°C). The male was put into the tank in the evening and the female the first thing next morning. Immediately the female was put in the male's colouring changed. The jaws became completely white, the bands seemed to broaden and the male's entire body took on a violet tinge. The female was immediately violently attacked and after a few hours had to be taken out of the tank because she had been so badly bitten, mostly on the caudal fin. Almost half of the lower lobe was missing. None of the other females were full enough for spawning so there was nothing to do but wait for the recovery of the injured female. After 10 days we tried again. Perhaps I should mention that this time a day before we put the fish into the spawning tank there was a steep fall in barometric pressure and the night before it rained hard. The female was in the tank only 10 minutes before the spawning began.

Spawning behaviour was like that of

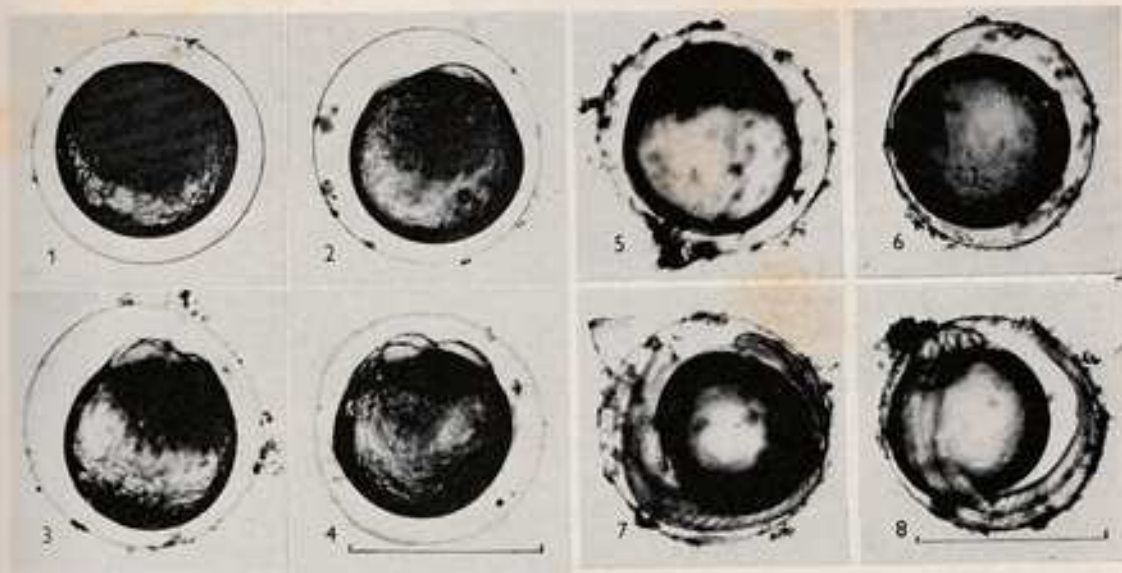
most barbs. The female looked for a suitable place; the male immediately approached her, touched her belly gently with his jaws and, when she stayed in one place, turned towards her and in a flash folded his caudal fin over the back of her body. The fish parted and the eggs were laid and fertilised. From a single spawning act there was only a small number of eggs, mostly two or three but occasionally up to ten. The spawning was repeated immediately, though it was interrupted by the male's display, his whole body fluttering like that of a butterfly. The behaviour of the fish just before the final act of spawning reminded me somewhat of the fish *Nannostomus marginatus*, including the greedy eating of the eggs, which were picked up straight from the female. The spawning as a whole, however, is identical with that of fish from the genera *Capoeta* and *Puntius*. The whole spawning lasted 2-4 hours and the number of eggs is dependent on the size and fullness of the female. It can vary between 50 and 300.

These fish are notorious cannibals. They eat the eggs during the spawning and it is important that they should be removed immediately afterwards. Above all, when the fish are put to spawn they must be watched because if the female is not ready she will almost certainly be bitten to death by the male. Also, after the spawn-



Spawning takes place in or close to plants. The contact between the pair is very brief and as they part the eggs are released and become stuck to the plants, while the parents fall through the water. The exact spawning site is frequently changed.





Development of *B. fasciatus* embryos (times after fertilisation): 1, egg at fertilisation (1.3 mm); 2 and 3, embryo (15½ minutes) at two-cell stage; 4, left cell at the top has again divided, the right cell is still single (45-60 minutes); 5, embryo (4 hours) at blastula stage, with numerous cells forming a cap above the yolk; 6, embryo (8 hours) at gastrula stage, with numerous cells enveloping the yolk sac; 7, at 21 hours, segmentation in the back part of the embryo can be seen; 8, fully developed fry shortly before hatching (30 hours). Lines beneath pictures 4 and 8 represent 1 mm.

ing, the male remains active and his displaying activities very soon turn to aggression.

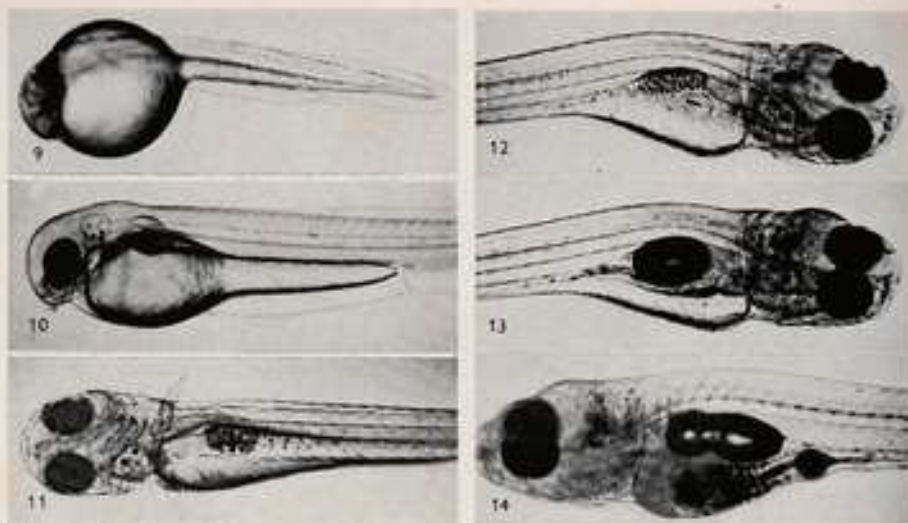
So here we have a fish that is not too large, that is very active and not too demanding in its requirements — it readily takes any live or dried food. However, it does not always remain peaceful to other species. It is one of those species that, if you wish to keep them with certain others, must be provided with a tank that is sufficiently large and is heavily planted so that the weaker inhabitants have possibilities for hiding.

We should like to emphasise two very important points in the breeding and rearing of these fish, which could account for the fact that this beautiful barb has not been bred more often in fishkeepers' tanks. The first concerns the voracity of the parents and their destruction of the glutinous eggs. Without careful supervision on the part of the breeder almost none of the eggs will survive. It may help to have a longish tank with a variety of furnishings so that the female loses her orientation for where she has actually laid her eggs, and consequently does not find them all again to swallow them.

The second point concerns the choice

of water. The instructions given above are quite suitable for achieving a spawning for the purpose of photographing it but they are less suitable for caring for and rearing the young. The embryos develop best in soft water of 2-3° carbonate-free hardness and about pH 6.5. From the egg stage up to 1-2 months, the young fish are very susceptible to the presence of carbonates. So one must be very careful about the condition of the water in the spawning tank. Also, moving the young fish is not without difficulties. Even at the age of 5-6 weeks a sudden increase in the carbonate hardness above 2-3° (carbonate-free) has disastrous results. The fry swim in a shoal at first restlessly through the tank, don't eat, and then as their bands darken, they lose their balance, swim in an unco-ordinated manner and lie on the bottom on their sides. It becomes increasingly difficult for them to breathe, until after 2-3 days they die. If the water is changed without delay for a carbonate-free one they will recover after a few hours, demonstrating their recovery by their obvious appetite. With a low pH, below 6, the signs are similar. When free-swimming the brood will eat any live foods available — cyclops nauplii, and, best of all, newly hatched brine shrimp with later





Hatched *B. fasciatus* fry (times from fertilisation): 9, with large yolk sac (31 hours; length 2.9 mm); 10, with diminishing yolk (82 hours; length 4.1 mm); 11, black pigment cells accumulate at the site of the future swimbladder (104 hours; length 5.1 mm); 12, internal organs are further developed (125 hours; 5.3 mm); 13, swimbladder is inflated and as the yolk is gone the fry begins to feed (128 hours; 5.4 mm); 14, swimbladder now has two lobes (202 hours; 7.1 mm) and the intestine has food in it — including a brine shrimp egg case (to the right) swallowed by the fry.

perhaps small Grindal worm.

For our further research we amassed 20 eggs and recorded their measurements in section: average 1.32 (1.20-1.40) mm. Length of the larvae at hatching time (after 31 hours at 26°C) was 2.9 (2.8-3.2) mm. Length of the fry at the time of free swimming (128 hours after fertilisation) was 5.4 (5.25-5.60) mm. The brood grows relatively quickly so that at the age of 4-5 days a dark fleck at the root of the tail with a pale eye is visible. When they are 10-12 mm long (at the age of about 3 weeks), the fish already have three bands. A week later, at the age of 4 weeks, a further, fourth, band appears at the base of the caudal fin.

In this article we have recorded our experiences with this fish so far and detailed the information we have gleaned. We hope our readers will help in spreading more widely the number of aquarists keeping the fish even though it is not a very suitable fish for aquarium use.

Perhaps at this point it is fitting to mention two more African barbs. One bears a very similar name and until recently, certain authorities made no dis-

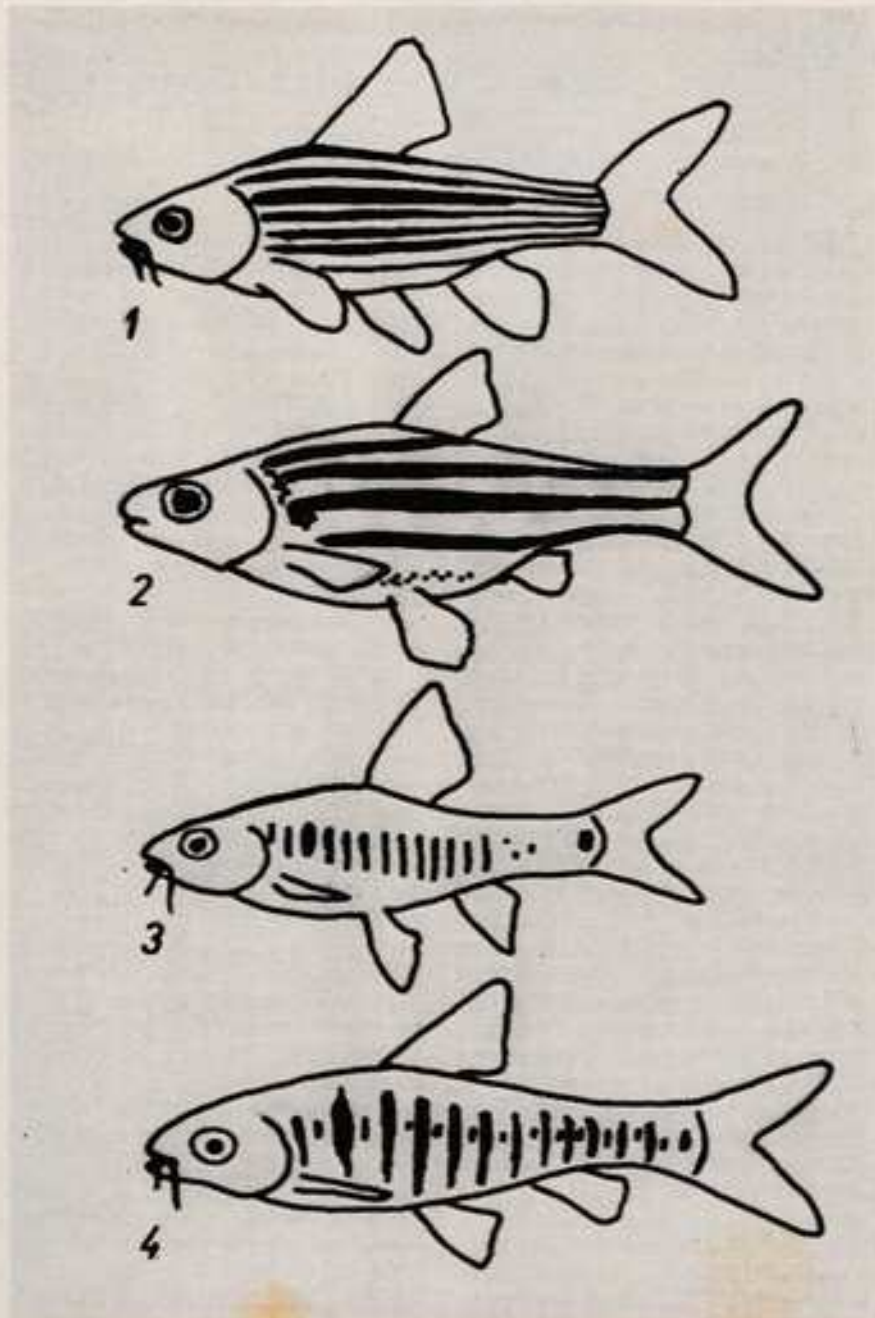
inction between either of them and placed them in a species without well-founded definition. Both fish can be distinguished from each other both in nature and in the aquaria. Here are a few guide lines which will help prevent the incorrect name being applied:

*Barbus (Barbodes) fasciatus*, Günther, 1868. Angola. Four barbels, 12-13 bars. Lateral line 25, overall; transverse line 7; colouring green, fins basically brown, anal fin blue-black; at the root of the tail a round black fleck. Not bred in the aquarium; aggressive.

*Barbus (Barbodes) bariloides*, Boulenger, 1914. S. Africa, northern Rhodesia (Zambia) and Katanga, Zambesi. Four barbels, 12-16 bars. Lateral line 28-30; transverse line 9. Ground colour orange to rust, belly whitish, striking red fleck on the dorsal and anal fins. Has been bred in the aquarium; shy, harmless to other fish.

For letting us have the living and preserved material on *B. fasciatus* we thank Dr H-J Franke, S. Zsitinszky and C. Lukes.

## Four African barbs that have been confused in reports



1. *Barbus (Barbodes) fasciatus* (Bleeker 1853) from Arnold & Ahl (1936)
2. *Barbus (Puntius) lineatus* (Duncker 1904) drawn from personal photograph
3. *Barbus (Barbodes) fasciatus* Guenther 1868 from Boulenger (1911)
4. *Barbus (Barbodes) bariloides* Boulenger 1914 drawn from personal photograph



## COLDWATER SCENE



By FRANK W. ORME

## Breeding is for Those Who can Make Fish Grow • First Foods for Fry

**H**OW quickly the months pass by — it seems not so long ago this column was giving advice for the successful overwintering of the goldfish varieties. Now the breeder should already be thinking of the breeding season. Eagerly the longer days are noted as each break-through of the sun raises hopes of an early spring. Thermometers are checked for signs of the longed-for coming of warmer conditions which will spur the fish into activity.

Many newcomers to the ranks of the goldfish enthusiasts imagine that they must spawn their fish at any cost if they are to be accepted by their fellow hobbyists. This is not the correct attitude, for, whilst the breeding and raising of your own stock gives a great deal of pleasure, it is essential that the art of keeping fish alive, healthy and growing be mastered — if art it be! Once this basic lesson of fish management has been well and truly learnt, then — and only then — should thought be given to the breeding of fish. If the would-be breeder finds difficulty in maintaining his adult fish in good health and fails to achieve any increase in the size of his fish — then he cannot hope to make a success of the raising of the young fish that any spawning could produce. I know a goldfish keeper, of some years' experience, who owing to lack of space has never attempted to breed his fish. Nevertheless, he gets a good deal of personal satisfaction when people remark upon the amount of strong healthy growth that is made by his fish.

If you have mastered the basic requirements of successful goldfish keeping, and have the space available to accommodate extra tanks, then there is no reason why you should not breed your own stock. I suggest that you decide upon just one variety, and then specialise in that type of goldfish by adopting a method of line-breeding. One method was described in 'Coldwater Scene' for the December, 1974

issue of PFM.

The essential requirements for the breeding and raising of goldfish are light, space and warmth, and ample nourishing food available in the correct size at the right time, in sufficient quantity to satisfy the appetites of all sizes of fish from the tiny alevins up to the large adults. Most of the successful goldfish breeders house their tanks in greenhouse-type buildings. These structures allow the maximum light to reach the aquaria, which are usually arranged on two-tier staging around the fish house.

Preferably, breeding tanks should not be any smaller than 36 inches by 15 inches with a depth no greater than 12 inches. Tanks of greater length and width could be employed with advantage, if space allows, thus providing a greater surface area of water. Many breeders use a standard range of tanks, in which all tanks measure 4 feet by 2 feet by 1 foot deep.

In order to obtain a quick hatch from the spawn and to keep the fish eating, which will induce good growth, it is necessary to provide some form of heating. My own preference is for each tank to be individually heated, by means of electric submersible heaters controlled by external thermostats. These are left permanently in place so that they can be brought into operation whenever they are required. Other methods are available and some breeders make use of space heating by radiated heat, such as electric tubular heaters, which tends to provide a uniform temperature throughout the fish house.

Nevertheless, I prefer a more flexible system, which allows me to have heat in some tanks whilst the others remain at normal temperature. When an adult pair of fish have spawned they can be moved to another tank. The tank containing the spawn has its heater switched on — to raise the water temperature to 70°F (21°C) to give a hatching in 3-4 days.



It is, of course, perfectly possible to breed goldfish in much less space — provided that the tanks are situated in a light position, especially one that allows the early morning sunlight to reach them, and the tanks are no smaller than the previously mentioned minimum of 3 feet by 15 inches. No attempt should be made to raise a large number of fish, as this will only lead to overcrowding, resulting in stunted growth. Ruthless culling will be the order of the day, the aim being to raise just a few decent well-grown specimens.

★       ★       ★

No matter whether fish are bred in a large or small set-up the fry will require plenty of food. It is no longer necessary to culture Infusoria for the first food, as was the general practice not so many years ago, which could sometimes become quite a messy and smelly business! Most goldfish, nowadays, are raised upon a first food of newly hatched brine shrimp, a food which the alevins will consume in large quantities. Provision must be made to ensure that an adequate supply is available when the tiny fish become free-swimming and start actively to search for food.

Possibly the simplest method of hatching brine shrimp eggs is as follows: arrange a 2 feet by 1 foot by 1 foot tank with a heater and thermostat set at 70°F (21°C). Into the tank place six glass sweet jars containing a brine solution; this solution should reach no higher than the shoulder in the jar. I find that a good hatching is made by dissolving eight tablets of Queens Salt Cubes into the jar of water. Each day a different jar should have a teaspoon of brine shrimp eggs sprinkled upon its water surface. It will help the hatching considerably if strong aeration can be supplied to each jar. On the sixth day the last jar will receive its spoonful of eggs and an inspection of the first jar should reveal a cloud of minute reddish brine shrimp nauplii.

Carefully siphon this live food into a piece of fine weave material; try to avoid picking up too much of the egg cases. Swirl the material into the tank of fish fry to disperse the tiny brine shrimps. Return the siphoned and filtered brine to the jar, and it should be possible to obtain two of three feeds from the jar during the

day. After full use the jar can be swilled out and refilled with fresh brine and eggs, it then being placed at the end of the battery of containers. By this method a jar of brine shrimp is maturing every sixth day, thus providing a jar of newly hatched brine shrimp every day of the week.

After the brine shrimp stage of feeding the fry can progress to micro worms or well-mashed white worms and sifted daphnia, with the occasional feed of fine dried food. These foods will also be required in some quantity for, if fed a little but often, the young fish will consume an astonishing amount of food during the course of a day. The more they eat the faster they will grow and the more space they will require!

The newcomer to the joys(?) of breeding will now realise that, if he is to be successful, he must give some thought to the preparatory work of providing sufficient space in which to accommodate not only the breeding pair but, also, the young fish as they grow. At the same time he must ensure that he has ample supplies of the correct size, and type, of food ready for feeding at the right time. It is no good starting the culture food supplies after the fry have hatched out. If you do many of the small fish will have starved to death before the food is ready. The early days are the most critical in the life of the young fish and underfed fry will not get off to a good start.

If, however, it has been decided that the necessary requirements can be provided, and that the basics of fishkeeping have been sufficiently mastered to assure a reasonable chance of success, then do not hesitate. Breeding and raising your own fish brings a special pleasure that the non-breeder does not experience. If you intend entering this aspect of the hobby this year, now is the time to prepare, in readiness for the coming season.

For the benefit of the first-time breeder — next month I will give some guidance upon the conditioning of the selected breeding pair and the setting up of the spawning tank.

★       ★       ★

In the latest issue received of the Newsletter of the British Koi-Keepers' Society there were interesting and informative items such as a list of the more common



varieties of koi. In this the variety name was given followed by an explanation; for instance — Matsuba means pine and refers to the pinecone effect created by each fish scale having a dark patch in its centre; thus the Aka-Matsuba is a red fish that has scales giving the appearance of a pinecone. There was an article entitled 'Septic Infections in Koi' in which the author, Tom Forman, described a disease that causes holes in the fish together with his method of bringing about a cure.

I found of particular interest a brief statement that the Northern Section hoped to hold a competitive show of koi sometime during next May. This followed hard upon the heels of a tentative suggestion that a specialist show, for lionheads and orandas, should be arranged. I must admit that I favour the idea of this type of competitive show — if the support is forthcoming from those who keep the particular variety of fish for which the show is arranged. Perhaps it will be possible to give more information in a future issue of *PFM*. In the meantime it would be interesting to learn what fellow coldwater fishkeepers think of the idea of such specialist shows.

On the subject of shows — goldfish enthusiasts may be interested in the open

show to be staged by Coventry P & AS on the 20th April (details will be found under 'Dates for your Diary'), at which I understand a much more comprehensive number of classes will be staged. This will be an improvement upon the more usual twintail, singletail, aov type of coldwater classes. Here is the opportunity to prove that the goldfish keeper can, and will, give support to those societies prepared to put on the classes for him. Sufficient support, by way of entries, could encourage other societies to improve their coldwater sections.

Finally, I have been requested by the Association of Midland Goldfish Keepers to extend an invitation to all interested fishkeepers in the area to attend a slide show and lecture about the Japanese goldfish keeper and the two varieties kept by amateurs in that country — the Azumanihiki and the Ranchu. The speaker will be Mr Alan Lawman, who spent a holiday in Japan visiting fishkeepers there. The meeting will commence at 2.30 p.m. on Sunday the 30th March at the Foleshill Community Centre, Coventry. Interested readers can obtain more information by making early application to me at 94, Newman Way, Rubery, Birmingham. Please enclose a s.a.e. for the reply.

## Personal Comment

*continued from page 488*

attention to any one group would tend to rock the boat, and possibly to overturn it.

Thus the BMAA might well find that it is profitable to have an intelligentsia but that it should forbear to admit of its existence! For this is a very democratic hobby (most hobbies are) — and no individual or group has any particular right to regard itself as something apart. It is perfectly true that brute ignorance and the starkest commercialism appear to coexist despite what I say, and for these unholy partners there can only be the greatest possible contempt.

The best way to dispel their worst effects is to unify all the better influences within the hobby in attempts to set and maintain standards of conduct and quality. The press is far and away the best medium in which to carry out debate on these things before our critical and discriminating audience, and every reader should, at some time or

the other, bare his soul to the Editor about how he feels about the way things are going. There are some who feel that they are not very good at putting things on paper: this, emphatically, does not matter, because every Editor is there to ensure that none of his readers looks foolish in the 'Letters' column, and it should also be remembered that the hesitant writer may often get his message across better than the specialist, who may get lost in technicalities or problems of style and politics.

Perhaps, then, it is not so much a Study Group which the BMAA needs as a regular flow of information at all levels on all matters. This would be of high educational value, but it may be something of a pipe dream because so much of its membership opts out of active participation in the monthly debate which their bulletin presents. In this the BMAA suffers from the malady of many another specialist society — growing pains. I hope, that for the good of all it will resolve its problems without surgery.



## Readers' Queries Answered



### Resting Aponogeton

*I am 'resting' an Aponogeton plant that I bought last year in an unheated tank, thinking that this would improve the plant, but I cannot believe that its present condition is just due to 'resting'. It looks as though it will never recover, but this is always advised so what is wrong?*

Advocates of this procedure suggest that it must only be adopted with mature plants. There is no indication of the size of your plant but if it was bought only last year it may well have been only a youngster then and it will not withstand being kept in a cold tank if it is a tiny plant. Until it is really well growing it requires moderately soft water of tropical tank temperature (70-75°F; 21-23°C) and diffused

light. The sprouted leaves must be of a good size and the corms fully developed, before the plant can be considered mature.

### Growth of Cryptocorynes

*Is there anything I can do to speed up the growth of cryptocorynes in my tank? I have had several red and green cryptocoryne plants for over 6 months now and although they are certainly bigger than they were, they don't look really robust. No amount of light seems to make any difference and they are not in new water.*

It is difficult to account for the poor growth of your *C. affinis*, which this red and green plant is likely to be. It is one of the best growing cryptocorynes, even in poor conditions. It would be advisable to check, first of all, that

the gravel has not become black underneath the surface so that it is no longer a suitable medium for plant roots. This species can grow to about 8 inches tall in the aquarium but it does take quite a few months to root itself thoroughly. Soft water is required for optimum growth, and water that is only mildly acid. Nor does it require a vast amount of direct light — it should be placed in the less brightly illuminated corners of the aquarium.

### Leeri Gouramis

*I have had a pair of leeri gouramis now for just about 2 months and am disappointed in them. They look very drab and are timid and nervous. They are quite a good size, too, about 3 inches long. The tank contains a usual mixture of community fishes, such as swords and neons, and these other fish are quite healthy and vigorous. The leeris don't seem to be diseased at all and the other fish have not developed anything since the leeris were put in.*

We would suspect that the tank conditions are not giving the leeris a chance to settle in. They are gentle fish and can react very nervously in a tank in which they have little cover

## Meetings and Changes of Officers

**CATERHAM NOMAD AS.** New secretary: Mr D. Charles (11 Homefield Road, Old Coulsdon, Surrey; phone Downland 51515). Meetings: Youth Centre, Crodstone Road, Caterham, Surrey (4th, 18th February). New members very welcome.

**EAST LONDON A & PA.** President, Mr P. Campkin; vice-presidents, Mr F. Arnold, Mr A. Field, Mr J. Pette, Mr J. Brydon, Mr Taylor; chairman, Mr K. Wrightson; vice-chairman, Mr K. Priest; secretary, Mrs P. Harris (85 Leigh Road, East Ham, London, E.8); social secretary, Mr J. Boss; programme secretary, Mr B. Corby; editor, Mr C. Ball; show secretary, Mr M. Pearson; show organiser, Mr L. Baker; equipment officer, Mr B. Argent; library, Mr C. Sweeting; P.O., Mr D. Flack. Meetings: 1st & 3rd Friday of month.

**HADEN AS.** See **HALESOWEN AS.**

**HALESOWEN AS.** New name (was Haden AS). Chairman, Mr F. Swift; treasurer, Mr D. Westhall; show sec-

retary, Mr J. Clews; secretary, Mr E. Poole (251 Howley Grange Road, Halesowen, West Midlands). Meetings: 1st Monday of month, 8.00 p.m. The Royal British Legion, Otterbourne Court, Bundle Hill, Halesowen.

**HIGH WYCOMBE AS.** Chairman, Mr R. Leslie; vice-chairman, Mr J. Pierce; secretary, Mr J. Bushby (3 Hawthorne Walk, Hazlemere, Bucks.; phone Penn 3825); P.R.O., Mr S. Friend. Meetings: alternate Thursdays. The White Horse Inn, West Wycombe Road (corner of Oakridge Road), High Wycombe. Visitors welcome to meetings.

**INDEPENDENT AS.** Chairman, Mr R. Bowes; secretary, Mr P. Coyle (100 Salop Road, Walthamstow, London, E.17; phone 01-521 0936); assistant, Mr R. D'Arcy; show secretary, Mr T. Kinsey; treasurer, Mr R. Bowes; assistant show secretary, Mr J. Gamble; P.R.O., Mr R. C. Burton. Meetings: alternate Thursdays (from 2nd January) St Stephens Church Hall,

Copeland Road, Leyton, E.10.

**LINCOLN & DAS.** New show secretary, Mr G. S. Hill (c/o 36 Richmond Road, Lincoln LN1 1LQ).

**NORTHWICH & DAS.** Chairman, Mr P. Hyland; show chairman, Mr I. Thorne; show secretary, Mr N. Thompson; assistant, Mr D. Valentine; social secretary, Mr B. Connolly; P.R.O., Mr H. Bockley; librarian, Mr A. Myers; treasurer, Mr S. Yates; secretary, Mr L. Bradley (4 Ash Road, Sandiway, Northwich).

**SOUTHEND, LEIGH & DAS.** President, Mr D. Edwards; secretary, Mr D. M. Cheawright (2 Cedar Avenue, Wickford, Essex; phone Wickford 2531). Meetings: 1st & 3rd Tuesday of month, 8.00 p.m. St Andrews Hall, Electric Avenue, Westcliff-on-Sea, Essex.

**VILLAGE AS.** Chairman, Mr F. Ansell; secretary, Mr G. Mollineux (60 Gandon Drive, Cheadle Hulme, Stockport, Cheshire; phone 061-485 4860); treasurer, Mr B. Grieves; show secretary, Mr B. Cross. New venue: The Hesketh Arms Hotel, Hulme Hall Road, Cheadle Hulme, Cheshire; 2nd Tuesday of month.



and boisterous companions. This is during the settling-in period — once they are settled they take their rightful place in the tank and are a most elegant addition to a community of medium-sized fishes. Although your community consists of fishes such as swords, medium-sized and healthy specimens of this and other species can be very boisterous and the newcomers may not have been used to such companions. To assist in acclimatising the leeris the plants should be really thick in the tank so that the gouramis can shelter there. A temperature of 70-75°F (21-23°C) is suitable. Leeri gouramis accept dried foods and should share readily in the diet already provided for your community fishes.

#### Giant or Not?

I have a suspicion that the fish sold to me as a giant gourami is in fact a thick-lip. I don't really mind too much but I would like to know for sure.

It has been 2½ inches in length for months now and it has just occurred to me that it should have been growing rather more quickly than this.

It is true that, as a species that could reach up to about 5 inches in length, *Colisa fasciata* (giant gourami) could be expected to continue to grow for some time yet. But confusion between *C. fasciata* and *C. labiosa* has existed in the past, particularly as both species share certain characteristics and even the thicker-lipped appearance of *C. labiosa* is to be found similarly in older giant gourami males. Colour differences alone are not to be trusted since the giant gouramis' colour can vary according to the type of original habitat of this widely distributed species. Nor does it help that the differences between the two species are likely to be most clearly visible in mature, well-coloured fish, since species identification is usually required for small, less

brightly coloured specimens! Compared with the giant gourami, *C. labiosa* is a stocky fish with a base to the dorsal fin that stretches much closer to its caudal than does that of *C. fasciata*. The dorsal fin of the coloured-up male does not have the red-spotted appearance of that of *C. fasciata*; the anal fin is rounder and tinted dull blue, with yellow to porcelain-white points to the rays.

#### Fruit-Fly Medium

In the article entitled 'Fruit-flies as Live Foods' by W. A. Toney (FHM, June 1974) mention is made of Nipagin. I am unable to purchase, or indeed find anyone who has heard of, Nipagin. Could you please tell me where and how I can obtain this as I expect my culture of flies to arrive at any time?

The manufacturers of Nipagin are Nipa Laboratories Ltd., Treforest, Glamorgan; phone Treforest 2128.



first prize was awarded to the chairman, Mr D. Soper, who also gained the first prize in the Home Aquarium Competition.

Enquiries regarding the Society should be addressed to the secretary, Mr J. Reeve (36 Rumbolds Lane, Haywards Heath).

THE MID-SUSSEX AS inter-club competition was judged by Mr J. Stillwell (FBAS), who awarded the prizes as follows: 1, Tonbridge AS (730 points); 2, Mid-Sussex AS (729); 3, Redhill & Reigate AS (704); 4, Southern Ind. AS (625); 5, Brighton & Southern AS (580); 6, Crawley AS (489). During the evening, Mr D. Soper, chairman, described his recent visit to Singapore and showed the slides he took whilst there. Members have also enjoyed a talk and slide show by Mr C. Corbin (FBAS) on tropical catfish in which it was emphasised that 'catfish must be fed properly and not left only to scavenge other fishes' left-overs.' At this meeting members judged a small tank (10 in. by 8 in. by 8 in.) design and the

## Fur, Feather and Aquaria Show

THE ESSEX, NORTH AND EAST LONDON AQUARIST ASSOCIATION reports, 'There was a greater number of entries at The Fur, Feather and Aquaria Show, held at The King's Hall, Lower Clapton Road, E.5. This was felt to be due to the improved central heating provided by the Hackney Borough Council and also to the use of under-tank heaters, which proved to be very satisfactory. This in conjunction with the new layout received several compliments at the time. The show was enjoyed by participants and visitors alike and we look forward to meeting friends old and new at this year's Show to

be held on Saturday, 22nd November, 1975. The Inter-club trophy was won by Bethnal Green AS; Best Fish in Show was won by Mr D. Lambourne (Riverside with a *Microglanis* offer; FBAS trophy for egg-laying toothcarps, Mr V. C. Green (Suffolk) with a *Cynolebias nigripinnis*; Best coldwater fish, Mrs S. Hedges (Bethnal Green) with a London shubunkin; Best Breeders, Mr G. Small (Walthamstow) with a team of platy coriatus.

Club furnished glass A&B: 1, Bethnal Green (Mr T. Kuderovitch); 2, Epsom (Mr D. Watts); 3, Chingford (Mr D. P. Ingle). Ind. aquascapists class A: 1, Mr G. Dallanegra (BGAS); 2, Martin S. Emotage (Walthamstow); 3, Mr B. Tarris (Chingford). Mid-fur, rished class Ad-c: 1, Mr B. Mrs Tolley (Chingford); 2, Mr B. Tarris; 3, Mr T. Kuderovitch. B: 1, Mr P.

Cats (Ind): 2, Mr G. Smith (Walthamstow); 3, Mr K. Walter (BGAS); C: 1, Mr P. Coyle; 3, Mr K. Adams (SLADAS); 3, Mr T. Woolley (Saraceni); C: 1, Miss R. Coyle; 3, Mr A. Chandler (Walthamstow); 3, Mr B. Mrs Tollyday, D: 1, Mrs M. Nebherrell (Surrey); 2, B: 3, Mr R. Thoday (Dunstable); D: 1, Mr J. Brown (Croydon); 3, Mr T. Woolley; 3, Miss F. Rogers (BGAS); E: 1, Mr A. Chandler (Walthamstow); 2, Mr R. Sowa (Ind); 3, Mr K. Adams, E: 1, Mr S. Tarrin; 2, Mr C. Breitkreutz (Suffolk); 3, Mr R. Bowen, F: 1, Mr G. C. Green; 2, B: 3, Mr B. Mrs C. Thomas (Walthamstow); G: 1, Mr D. Lambourne; 2, Mr & Mrs Tilly (Saraceni); 3, Mr A. Halsey (BGAS); H: 1, Mrs S. Hodges; 2, Mr F. Cottle (N. Kent); 3, Miss F. Rogers, J: 1, Mr G. Smith; 3, Mr C. Cheswright (SLADAS); 3, Mr R. Thoday, K: 1, Mr B. Mrs Tollyday; 2, Miss D. Winder (E. Giltwich); 3, Mr R. Sowa, L: 1, Mrs S. Hodges; 3, Mr D. Windsor; 3, Mr T. Coyle, M: 1, Mrs S. Hodges; 2, Mr J. Brown (Croydon); 3, Mr R. Thoday, N: 1, Mr G. Smith; 3, Mr P. Coyle; 3, Mr D. Dale (BGAS); O: 1, Mr G. R. Brett (N. Kent); 2, Mr K. Adams (SLADAS); 3, Mr A. E. Neeson (Orpington); P: 1, Mr A. E. Neeson; 2, Mr T. Woolley; 3, Mr B. Mrs S. Fry (N. Kent); Q: 1, B: 2, Mr A. V. Wakenell (Hornford & Beconwe); 2, Mr D. Dale; R: 1, Mr G. Smith; 2, Miss D. Winder; 3, Mr T. Woolley; S: 1, B: 3, Mr B. Terry; 2, Mr C. Breitkreutz; T: 1, B: 3, Mr D. Cheswright; 2, Mr A. Chandler; U: 1, B: 2, Mrs S. Hodges; 3, Mr K. Adams, U: 1, Mr H. Berger; 2, Mr B. Mrs B. Fry; 3, Mr T. Burlock, VA-G: 1, Mr H. Berger; 3, B: 3, Mr T. Sullock, WH-L: 1, B: 2, Miss R. Berger, W: 1, Mr B. Peacock; 2, Mr G. R. Brett; 3, Mrs S. Hodges, X-B-M: 1, Mr C. Breitkreutz (Suffolk); 2, Mr R. Sowa; 3, Mr V. C. Green, X-O-T: 1, Mr G. Smith (Walthamstow); 2, Mr A. E. Neeson; 3, Mr S. Baileys, XU-W: 1, Mrs K. Woolley (Saraceni); 2, B: 3, Mr B. Mrs Woodward (M. Kent); 2, 1, Mr D. Cheswright; 2, Mr D. Dale; 3, Mr A. Chandler.

## Ilford's Annual Show Results

ONCE again ILFORD & DA & PS had a record number of entries for their annual show and these were all of a very high standard. Trophy winners are as follows: Wade Cup for Best Furnished Aquaria, Mr D. Seaman; Arthur Stebbins Cup for Best Livebearer, Mr C. Hackshill; Ilford Rose Bowl for Best Ladies entry, won jointly by Mrs P. Read and Mrs B. Oakley; Berger Seaman cup for Best Egglayer, Mr J. Rendell; Baby tray for Best Breeders Team, Mr J. Rainbird; Victoria trophy for Best Child, Mr J. Rendell; Junior Shield, Best Junior entry, Master P. Barham.

**BASINGSTOKE AS** are holding a Twenty-first Anniversary Celebration this month (14th February) and all past members are invited to come and join present members and invited guests of the Society at the meeting place, Wote Street Hall, Basingstoke. Past members should contact Mr Adrian Blake, 59 Bounty Road, Basingstoke; phone Basingstoke (0256) 63461.

### The different class winners are:

Individual furnished aquaria: 1, Mr D. Seaman; 2, Mr H. Berger; 3, Mr M. Shadrack, av Barbs: 1 & 2, Mrs B. Oakley; 3, Mr R. Ruth, av Characini: 1, Mr D. Oakley; 2, Mrs B. Oakley; 3, Mr J. Rendell, av Cichlid: 1, Mr J. Rendell; 2, Mr J. Rainbird; 3, Mr D. Oakley, av Labynth: 1, Mr M. Shadrack; 2, Mr J. Rainbird; 3, Mrs S.

Risk, av Catfish: 1, Mr D. Oakley; 2, Mr J. Rainbird; 3, Mrs B. Oakley, W.C.M.M. & damon: 1, Mrs P. Read; 2, Mr D. Oakley; 3, Mrs B. Oakley, av Rasbora: 1 & 2, Mrs P. Read; 3, Mr T. Robinson, av Loach: 1, Mr R. Ruth; 2 & 3, Mr W. Rowe, Breeders livebearer team: 1, Mr D. Oakley; 2, Mr D. Seaman; 3, Mr M. Shadrack, Breeders egglayer team: 1, Mr J. Rainbird; 2, Mr C. Lomas; 3, Mr M. Shadrack.

av Mollies: 1 & 2, Mr C. Hackshill; 3, Mr F. Horley, av Swordtail: 1, Mr R. Ruth; 2, Mr D. Seaman; 3, Mr D. Knopp, av Platy: 1 & 2, Mr R. Ruth; 3, Mr G. Crosby, av Male guppy: 1, Mr C. Smith; 2 & 3, Mr C. Hackshill, av Female guppy: 1, Mr C. Hackshill; 2, Mr G. Pearson; 3, Mr W. Hart, av Singletail goldfish: 1 & 2, Mr M. Shadrack; 3, Mr H. Berger, av Twin-tail goldfish: 1, Mr G. Pearson; 2 & 3, Mr H. Berger, av Coldwater fish: 1, Mr A. Wright; 2, Mr F. Davidson; 3, Mr F. Horley.

av Tropical fish: 1, Mrs P. Read; 2, Mr D. Oakley; 3, Mrs B. Oakley, Tropical plant: 1, Mr M. Shadrack; 2, Mr D. Seaman; 3, Mrs P. Read, Cold-water plants: 1 & 3, Mr H. Berger; 2, Mr W. Rowe, Breeders pairs: 1, Mrs P. Read; 2, Mr D. Oakley; 3, Mr M. Shadrack.

## Well-Supported Show at Bradford

A RECORD number of entries made the BRADFORD & DAS Open Show a great success and Society support from many miles distance was given. Mr J. Robertson (Northumbrian) won the Best in Show award with the fish he entered in the av catfish class (78 points). Details are as follows:

Guppy: 1, Mr & Mrs Baldwin (Scaunthorpe, 70); 2, Mr & Mrs Hooton (Sandgrounders, 68); 3, Mr N. Blenkins (Bridlington, 67), Sword-tail: 1, Mr & Mrs King (Doncaster, 72); 2, Mr G. Allen (S. Humber-side, 69); 3, Mr Eason (Sandgrounders, 68), Platy: 1, D. & M. Laycock (Sheaf Valley, 71); 2, Mr & Mrs Baldwin (71); 3, C. P. & S. Norton (Sandgrounders, 68), Mollie: 1, Mr G. Brown (Northumbrian, 73); 2, Master Hedge (Sandgrounders, 71); 3, Mr S. Hooton (68), av Livebearers: 1, Mr J. A. Whitley (Aireborough, 73), section winner; 2 & 3, Mr K. Douglas (Hull, 71, 70), Barbs (up to and including rosy barbs): 1, Mr J. S. Hall (Aireborough, 68); 2, Mr B. Mrs Norton (S. Humber-side, 67); 3, C. P. & S. Norton (68), Large barbs (over rosy): 1, Mr & Mrs Riley (Leeds G.P.O., 73, section winner); 2, Mr & Mrs Rawlings (Castleford, 69); 3, Mr L. Glover (Castleford, 68), Characins (up to breeding heart size): 1, D. & M. Laycock (74, section winners); 2, Mr & Mrs Richardson (Scarborough, 72); 3, Mr & Mrs Copley (Doncaster, 71), Large characins: 1, Mr A. Frisby (Hull, 73); 2, Mr & Mrs Baldwin (72); 3, Mr S. Hooton (70), Carps & minnows: 1, C. P. & S. Norton (75); 2, Mr & Mrs Copley (73); 3, Mr & Mrs Green (Castleford, 70), Sharks & hyno taxa: 1, Miss S. Clark (Aireborough, 75),

section winner); 2, Mrs P. Hishop (Swillington, 74); 3, Mr D. Soper (Bradford, 73).

Killifish: 1, Mr A. Horsman (72, section winner); 2, Mr & Mrs Richardson (71); 3, Mr Reid (Workop, 70), Fishers: 1, D. & M. Laycock (72); 2 & 3, Mr L. Smith (Castleford, 70, 69), av Anabantids: 1, Mr & Mrs Simpson (Workop, 77, section winner); 2, Mr P. Halsey (Swillington, 72); 3, Mr & Mrs Emmerson (Castleford, 71), Dwarf cichlids: 1, Mr & Mrs Tyson (S. Humber-side, 72); 2 & 3, Mr & Mrs Holmes (Castleford, 69, 67), large cichlids: 1, Mr & Mrs Fletcher (Doncaster, 72), section winner; 2, Mr S. Wolstenholme (Heywood, 75); 3, Mr J. S. Hall, 70), Angel fish: 1, Mr N. Blenkins (Bridlington, 71); 2 & 3, Mr D. Grogan (Blackburn, 70, 67).

Corydoras and Brochis: 1, D. & M. Laycock (75); 2, Mr & Mrs Fletcher (73); 3, Mr & Mrs G. Sand (Sandgrounders, 71), Loaches and kolia: 1, Mr & Mrs Jones (Scaunthorpe, 74); 2, Mr & Mrs Daines (Doncaster, 72); 3, Mr & Mrs G. Muckle (Sandgrounders, 71), av Catfish: 1, Mr J. Robertson (Northumbrian, 78, section winner); 2, Mr J. S. Hall (76); 3, Mr & Mrs Copley (74), av Tropicals: 1, Mr & Mrs Copley (77), section winner); 2, Mr & Mrs Caldwell Scaunthorpe Museum, 76); 3, Lyn Reid (Workop, 73), Breeders livebearers (1-10): 1, Mr & Mrs Kivington (Doncaster, 71, section winner); 2, J. S. Hall (69); 3, D. & P. Birdall (Aireborough, 68), Breeders livebearers (11-20): 1 & 2, Mr & Mrs Kivington (70, 67), Breeders egglayers (1-10): 1, Mr N. Lynch (Stanley, 76, section winner); 2, Mr & Mrs Kivington (74); 3, Mr J. S. Hall (73), Breeders egglayers (11-20): 1, Mr & Mrs Fletcher (Doncaster, 75); 2, Mr S. Hooton (74); 3, Mr S. Nichols (Swillington, 73), Pairs livebearers: 1, D. & F. Birdall (Aireborough, 75, section



winner); 2, Mr & Mrs Kilmington (74); 3, Mr & Mrs Dimes (73). Pairs age layers: 1, Mr Reid (Workop, 73, section winner); 2, Mr & Mrs King (Doncaster, 75); 3, Master J. Emerson (Castledon, 74).

Common goldfish: 1, Mr & Mrs Richardson (74); 2 & 3, Mr J. S. Hall (72, 71). Fancy goldfish: 1 & 3, Mr J. S. Hall (76), section winner, 74); 2, Miss S. Clarke (75), one Coldwater: 1, Mr Short (Sheaf Valley, 76); 2, Miss L. Kerry (Sheaf Valley, 75); 3, Mr J. S. Hall (74). Marine fish: 1, Mr & Mrs Green (Castledon, 73, section winner).

## In Brief...

... **NORTHWICH & DAS** held their annual dinner recently where annual awards were presented by the chairman, Mr P. Hyland. Aquarist of the Year Cook trophy went to L. & D. Thorne with D. & M. Valentine second and Mr L. Bradley third. Member of the Year was Miss L. Rimmer; 2, Mr L. Thorne; 3, Mr D. Valentine. Fish of the Year trophy went to Mr P. Wrench with Mr L. Thorne coming second and third.

... **NEW FOREST AS (FBAS)** are holding their annual Home Furnished Aquaria competition this month (February). The shadow of rising prices overhangs all aspects of the hobby and the Society have found that the increasing cost of room hire, colour slides etc. makes it necessary to increase the yearly subscription from the next AGM. Mr J. Jeffery won in the table show for platys and Mr M. Aust in that for barbs.

... **YEOVIL & DAS** hope that many aquarists will be attending their film show on Wednesday, 5th March. An open invitation is extended to all. Details from secretary: Mr P. C. New, 8 Mayfield Road, Yeovil, Somerset: phone Yeovil 24225. New members will be very welcome to the Society. Meetings are held at 7.30 p.m. on the first Wednesday of each month at The Moose Centre, 54 Michaels Avenue, Yeovil (also the venue of the film show).

WITH the successful inciting of South Shields and Basingstoke AS at a spur, **KILLINGWORTH AQUARIST ASSOCIATION** have been endeavouring to find a southern club with which to 'twine' in the same way — so far without success (not even replies!). The KAA is a new organisation with about 25 members that was founded in March 1974. Members have showed and been placed at every local open show last year and hope to run their own first Open Show in 1975. Members would be willing to travel to any southern open show. If any southern club is interested would they please write to Killingworth's secretary, Mrs M. Hickman at Tamerisk, 14 Grimstone Court, Garth 21, Killingworth, Newcastle 12.

... A VERY varied and interesting programme has been arranged by the **EAST LONDON AQUATIC AND PONDKEEPERS ASSOCIATION** for 1975 and new faces will be most welcome. Meeting: first and third Friday of month. For further details please contact secretary Mrs P. Harris, 56 Leigh Road, East Ham, London, E.6.

... THE Fish of the Year Show was judged by Mr P. Ginger (FBAS) at the monthly meeting of **BRIGHTON & SOUTHERN AS**, when over 20 entries were benched, a triumph for the efforts of show secretary Mrs B. Feek. The chairman, Mr B. Nice, organised a 'fishy' competition during the evening, which proved to be most entertaining. Membership details are available from the secretary, Mr S. Feek (55 Newmarket Road, Brighton).

... **LINCOLN & DAS** are holding two Bring and Buy Sales for club funds this year. These will be on Monday, 21st April and Monday, 20th October.

... AT the last meeting of the old year, a Twenty Questions quiz and 'Crazy Fish' quiz, as well as sherry and cheese distributed to members, resulted in a very festive atmosphere

at the **BOURNEMOUTH AS** monthly meeting. Table show winners were: barbs, Mr Chatfield; catfish and loach, Mrs Bebb; cichlid, Mrs Bebb; ob pairs, Mrs Bebb; tropical breeders, Mrs Bebb; sov tropical, Mr Chatfield.

... THE **SOUTHEND, LEIGH & DAS Open Show**, to be held on 10th May at St Clements Hall, Leigh-on-Sea, Essex, will cover over 40 classes, to include club and individual furnished aquaria, aquascapes, marines and junior classes. Show secretary is Mr Derek Durrant, 172 Trinity Road, Southend-on-Sea: phone 610576.

... AT a recent meeting of **SWILLINGTON AS** members were given an interesting and helpful talk by Mr G. Binks on home furnished aquaria. Results of the home furnished aquaria competition: 1, Mr C. Freeman (75); 2, Miss S. Myers (73); 3, Mr B. Hamburg (72). Results of the fourth quarterly table show: A.O.V.: 1 & 2, Mr J. Abbot; 3, Mr B. Hamburg; Rasboras, carps & minnows: 1, Mrs P. Hislop; 2, Mrs A. Hislop; 3, Mr C. Freeman; Livebearer pairs: 1, Mrs A. Hislop; 2, Mr J. Parkin; 3, Mr R. Jefferson; Eglayer pairs: 1, Mr J. Abbot; 2, Mrs A. Hislop; 3, Mrs P. Hislop.

... MR. T. HALL won the **HIGH WYCOMBE AS** Table Show trophy. The Society's Open Show this year (1975) will incorporate the Three Counties trophies and commemorate the 21st anniversary of the Three Counties Group. High Wycombe AS is now open to junior members aged 14 years and over on recommendation of any club member.

... **HADEN AS** has been renamed **HALESOWEN AS**. The headquarters are The Royal British Legion, Otterbourne Court, Bundle Hill, Halesowen; meetings are held the first Monday of the month at 8.00 p.m. Secretary is Mr E. Poole (251 Howley Grange Road, Halesowen, West Midlands).

... 30 members of **GLOUCESTER AS** enjoyed a lecture given by Mr B. James on tropical

## FEDERATION



## NEWS

Photographed at the last Federation Assembly (left to right): Mr Alec Fraser-Brunner, vice-president; Dr John Wilkinson, vice-president; Mr Frank Tomkins, chairman; Mr Ken Pye, vice-president



plants, held as usual at The Old Tuffley Community Centre, Gloucester. The Society has now received trophies to be awarded for each monthly table show with a large trophy for the member who wins most table shows throughout the year. Plans for this year's Open Show include the organisation of a ticket raffle.

THE end-of-year report of the chairman of **COVENTRY POOL & AQUARIUM SOCIETY**, Mr Allan Nash, gives cheering news of average attendance at meetings running into the fifties. This includes a lot of youngsters and three junior section table shows are being arranged in 1975. Table shows have also been well supported with very good quality fish.

A QUIZ between a team of ladies of **HASTINGS & ST LEONARDS AS** and a team composed of male members resulted in a win for the ladies by 34 points to 30. Mr D. Cooper from Ringmer was quiz master; the men were represented by Mr C. Waddell, Mr G. Pryke, Mr P. Maxwell and Mr E. Messiter, and mesdames Griez, French, Adams and Reed composed the female team. Members have also enjoyed a talk by Mr Bernard Pye on aquarium plants.

AT the December Assembly of the Federation of British Aquatic Societies the ceremony took place at which honorary Life Vice-Presidencies announced last year were conferred upon Mr Alec Fraser-Brunner, Dr John Wilkinson and Mr Kenneth J. Pye in grateful recognition of their services to the hobby. Curator of the Van Kleef Aquarium, Singapore, and now Curator of the Carnegie Aquarium, Edinburgh, Mr Fraser-Brunner has, over the past 45 years, been the author of innumerable invaluable technical articles in both scientific journals and the aquatic press, and amongst much other work for the hobby is noted for pioneer work on the FBAS Judges and Standards Committee, particularly in the drawing up of Standards. Dr John Wilkinson, a pioneer aquarist, is a Founder Member of Belle Vue AS and President of the Federation of Northern Aquarium Societies. Mr K. J. Pye has been both assistant General Secretary and then General Secretary of the FBAS for many years and devoted a great deal of time and effort in his work for the Federation.

Chairman Mr Frank Tomkins also announced the inauguration of a special award to be made from time to time at the Council's discretion, in the form of a gold badge carrying a design of clasped hands of thanks surmounted by the initials FBAS, and at this meeting the presentation for the first time was made to Mr Anthony Evans, in aquarium journalism for 26 years and editor of **PETFISH MONTHLY** and organiser of The Aquarium Show.

In response to requests from groups wanting to hire the popular FBAS slide-lecture programmes the Federation has now made these available to non-affiliated societies. There are six 'Aqua Talk' titles available at present, with more in production: no. 1, 'Non-U Goldfish' by R. D. Esson (49 minutes); no. 2, 'Why Corydoras?' by C. A. T. Brown (44 minutes); no. 3, 'Barbs' by P. Ginger (63 minutes); no. 4, 'G is for Catfish' by Derek Lambourne (41 minutes); no. 5, 'Keeping Killies' by C. A. T. Brown; no. 6, 'Down Among the Z Men' by Bernard Pye (58 minutes). Each programme is accompanied by brief notes and operating instructions. Tape speed is 3½ inches per second and spool size is 5 inches. Hire charges including delivery postage to hirer are £2.50 per programme for affiliated societies and £3.50 for non-affiliated societies. For details a stamped addressed envelope for reply should be sent to Mr R. C. Mills, 70 Lee Road, Perivale, Middlesex UB6 7DB.



## Dates for Your Diary

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

2nd March, **KEIGHLEY AS** Open Show, The Leisure Centre, Victoria Park, Keighley. Banching 12-2 p.m.

15th March, **HENDON & DAS CONGRESS**, Whitefields School, Claremont Road, London, NW2. Speaker: Mr W. A. Torrey from Hulland.

16th March, **DON VALLEY AS** Open Show, Staff Dining Rooms, British Steel Corporation Works, Stockbridge, nr. Sheffield. Details: Mrs E. Hartley, 11 Hall Road, Wals, Siskstone Common, Barnsley, Yorks.

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

22nd March, **TYNE-TEES AREA ASSOCIATION OF THE FBAS CONVENTION**, Bay Hotel, Whitburn (Sea Front), Tyne & Wear, 2.0 p.m. Tickets: £1 incl. buffet. Enquiries: Mr G. Liddle, 2 Crisler Avenue, Gateshead, NE9 6JJ.

23rd March, **WORKSHOP A & B 25** Open Show, North Notts College of Further Education, 81th Road, Worksop, Notts. Schedule: Mr A. Mawson, 36 Waverley Way, Manton, Worksop, Notts.

30th March, **SHEFFIELD & DAS** Open Show, Granville College, Granville Road, Sheffield. Details: Mrs J. Sanderson, 12 Greystones Rise, Ecclesall, Sheffield 11 7JP, Yorks.

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

5th April, **RIVERSIDE AS** Open Show, St Saviours Church Hall, Cobbold Road, London, W12. Details: Mr D. Lambourne, 7 Wheeler Court, Pough Road, London, SW11: 01-223 7630.

13th April, **WARRINGTON AS** Open Show, Parr Hall, Palmers Square, Warrington, FBAS Rules. Schedules: Mr J. Higham, 42 Hood Lane, Sankley, Warrington, Lancs WA5 1EA; phone 36935.

13th April, **NELSON AS** Open Show, Nelson Civic Centre, Stanley Street, Nelson, Lancs. Details: Mr R. McKenna, 52 Bath Street, Nelson, BB9 0NP.

15th April, **CORRINGHAM & DAS** Open Show, Details: Mr G. C. North, 105 Southend Road, Stamford-le-hoop, Essex.

15th April, **YATE & DAS** Open Show, King Edmunds School, Yate, Nr. Bristol (New Vessel). Schedules: Mr C. Stuckland, 30 Borzato Close, Chipping Sodbury, Bristol BS17 6DZ.

19th April, **RESGATE & REDHILL AS** Open Show, Market Hall, Redhill Surrey. Details: Mr M. Sandford, 5 Victoria Road, Earlswood, Redhill, Surrey: Redhill 69375.

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

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

20th April, **STOCKTON-ON-TEES AS** Open Show, St Peter and Paul School, Durham Road, Stockton (adjacent to the Mill House Hotel). Details: Mr C. W. Buck, 22 Darby Grove, Thornaby, Cleveland, TS17 8SX.

28th April (note change of date), **CATFISH ASSOCIATION OF GREAT BRITAIN 2nd** Open Show (catfish only), St Saviours Church Hall, Cobbold Road, London, W12. Details: Mr D. Lambourne, 7 Wheeler Court, Pough Road, London, SW11 2AX: phone 01-223 2630.

10th May, **PORT TALBOT AS** Open Show, YMCA Buildings, Port Talbot. Schedules: Mr A. E. B. Fouracre, 3 Crown Street, Valence, Port Talbot, Glam. SA13 1AZ.

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

11th May, **BOURNEMOUTH AS** Open Show, Kinon Community Centre, Williams Lane, Kinon, Bournemouth. Details in follow.

11th May, **YEOVIL & DAS** Open Show, Details: Mr P. C. New, 8 Mayfield Road, Yeovil.

24th May, **GOLDFISH SOCIETY OF GREAT BRITAIN** Meeting, Conway Hall, Red Lion Square, Holborn, London WC1, 2.00 p.m.

25th May, **CORBRY & DAS** Open Show, Corby Civic Centre, FBAS Rules. Schedules: Mr A. Shaw, 176 King Street, Kettering, Northants. (mid-March).

1st June, **NEWCASTLE TROPICAL FISH SOCIETY** Open Show, St Johns Church Hall, Westgate Road and

Drainage Street Junction, Newcastle-upon-Tyne. Schedules nearby: Mr L. R. Lawson, 84 Grosvenor Road, Jesmond, Newcastle-upon-Tyne 2.

1st June, **HAVANT & DAS** Open Show, The Monchiston Hall, Harmondham, Hants. Schedules: Mr K. Taylor, 3 Halfbank Close, Cowdlin, Hants: phone Roman Way 4160.

8th June, **SHERWOOD AS** Open Show, The Thoresby Minors Welfare Hall, Edwinstowe, Ollerton, nr Mansfield, Notts. Schedules: Mr J. Jones, 25 Marquis Avenue, Mansfield, Woodhouse, Notts: phone Mansfield 32248.

14th June, **DUNWOW & DAS** Open Show, Details: Mr A. V. Gall, 28 River View, Braintree, Essex, CM1 7HX.

14th June, **LLANWIT MAJOR AS** (CNA/AFBAS) Open Show, The Town Hall, Llanwit Major, Quality plaques all classes. Schedules (March): Mr J. J. Edwards, Glanaton, Mill Park, Llanblethian, Cowbridge, Glam. CF7 7BG.

15th June, **GOSPORT & DAS** Open Show, Details: Mr J. Clarke, 37, Rowner Close, Rosser, Gosport: phone Fareham 66106.

22nd June, **SOUTH SHIELDS AS** Open Show, Bolingbroke Hall, Details: Mr P. Wright, 11 Boston Crescent, Town End Farm, Sunderland, Tyne/Wear.

29th June, **LINCOLN & DAS** Open Show, The Drill Hall, Broadgate, Lincoln. Details: Mr G. S. Hill, c/o 38 Richmond Road, Lincoln LN1 1LD.

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

3rd August, **TONBRIDGE & DAS** Open Show, Details: Mr S. Feast, 10 Earley Road, Sevenoaks, Kent, TN13 1XX: phone Sevenoaks 54998.

10th August, **GRIMSBY & CLEE-THORPES AS** Open Show, Memorial Hall, Cleethorpes. Schedules: Mr T. F. Walker, 61 Chevington Walk, Grimsby, 6th Humber-side: phone Heaving 7513.

7th September, **BETHNAL GREEN AS** Open Show, Bethnal Green Institute, 229 Bethnal Green Road, London, E2. Schedules: Mrs S. Hedger, Kol Korner, 150 Ashburton Avenue, Seven Kings, Hudd, Essex, IG3 9EL: phone 01-590 3239.

21st September, **HUCKNALL & BULWELL AS** Open Show, Details: Mr J. R. Wastcott, 9 Royce Avenue, Westville, Hucknall, Notts.

24th-26th October, **THE AQUARIUM SHOW '75** at the Royal Horticultural Society's Old Hall, Vincent Square, London SW1. Presented by the Federation of British Aquatic Societies. Aquarium society showkeeping exhibits invited. Details from the organiser, PFM, 554 Garratt Lane, London SW17 0NY: phone 01-847 2805.

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

22nd November, **FUR, FEATHER & AQUARIA SHOW**, King's Hall, 39 Lower Clapton Road, London, E5. Schedules: Mrs S. Hedger, Kol Korner, 150 Ashburton Avenue, Seven Kings, Hudd, Essex, IG3 9EL: phone 01-590 3239.

ON Saturday, 8th March, the **BRITISH AQUARISTS STUDY SOCIETY** will be holding its first Spring Meeting at the Zoological Society Lecture Hall, London Zoo. This will be a Symposium on 'Diseases of Fishes'. The main speaker will be Mr Randolph Richards of Stirling University, Scotland. Tickets at £1.50 each (including tea) are available from Mr F. Keens, Highcliffe, Old Hill, Woking, Surrey. The meeting will start at 2.30 p.m.

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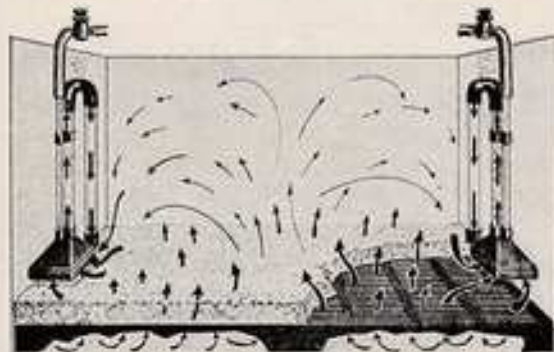
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Stratford Road, Monkspath, Shirley, Solihull, Warwickshire

## HILENA-VIT

Hilena-Vitamin is a vitamin complex preparation especially adjusted to enrich the vitamin content of feed for aquarium fish. It is a composition of 20 essential vitamins and is presented in liquid form. Special stabilisators make the liquid stable for years.

There are three components to the Hilena-Vitamin:

1. Vitamin complex containing 20 vitamins
2. Intestine protective colloid warranting good tolerance and preventing irritation of the mucous membranes
3. Anti-biotic agent especially developed for animal feed which allows maximum absorption of the feed by reducing intestinal bacteria.

IT MAY BE ADDED TO PREPARED OR LIVE FOODS BEFORE THEY ARE INTRODUCED TO THE AQUARIUM.

IT HAS BEEN FOUND INVALUABLE FOR MARINE FISHES WHICH OFTEN LACK THE EXTRA VITAMINS FOUND IN THEIR GREAT VARIETY OF NATURAL FOODS, AND OF PARTICULAR VALUE TO INVERTEBRATES AND FILTER FEEDERS IN NATURAL SYSTEM MARINE AQUARIA.

**Price: £1.65**

From all Hilena stockists or direct from us.

### WHOLESALE STOCKISTS OF HILENA PRODUCTS:

Barry M. Austin & Co. Hampton Middlesex — Betta Aquaria, Newcastle-on-Tyne — R.J. Cook & Son, West Bromwich, Staffs — Hazel Barrow Fish Farm, Leek, Staffs — W. Howards Pet Supplies, Bristol — Laurel Pet Supplies Ltd, Manchester — Norwood Aquarium, London S.E. 27 — PAACO Wholesale, High Wycombe, Bucks — C.J. Skilton, Chelmsford — Tri-Mar (Wholesale) Aquaria, Camborne, Cornwall — The Tropical Marine Centre Ltd., London N.W.9 — Wholesale Tropicals, London E.2.

**PLEASE NOTE**—All enquiries requiring a reply MUST be accompanied by S.A.E. Our premises are situated on the main Stratford-Birmingham road, 3 miles from Birmingham, Midland "Red" Bus No. 150 from Bus Station, Birmingham, passes the door, right at "The Cross", Monkspath.

**HOURS OF BUSINESS**—NOVEMBER-MARCH 10 a.m.-5 p.m. APRIL-OCTOBER 10 a.m.-6 p.m.

### CLOSED ALL DAY SUNDAY AND MONDAY

**TERMS OF BUSINESS**—Cash with order please. Fish sent by rail. Tropical Minimum order £7.50. Insulated container and carriage £1.50. Coldwater minimum order £5 plus £1.25 cart and carriage. Plants by post (minimum order £5.00) please add £0.25 post and packing.

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