

NOVEMBER 1974 23p

THE **AQUARIST**  
AND PONDKEEPER





# THE AQUARIST AND PONDKEEPER

The Aquatic Magazine with the Largest Circulation in Great Britain

Published Monthly 23p

Printed by Buckley Press,  
The Butts, Half Acre,  
Brentford, Middlesex.  
Telephone: 01-568 8441

Subscription Rates:  
The Aquarist will be sent post  
free for one year to any address  
for £3.45. Half-yearly £1.72.

MSS, or prints unaccompanied  
by a stamped addressed  
envelope cannot be returned  
and no responsibility is accepted  
for contributions submitted.

Founded 1924  
as "The Amateur Aquarist"  
Vol. XXXIX No. 8, 1974

Editor: Laurence E. Perkins  
Advertisement Manager:  
J. E. Young



Our Cover Photo  
American Flagfish  
Photo by Karl Knaack

## Contents

	PAGE
Lesser Known Indian Aquarium Fishes (2) Melon Barb	294
What Is Your Opinion?	296
Our Readers Write	300
The Pyjama Cardinal	302
A Pond Restored	303
Fish-breeding in Commercial Quantities	304
Our Experts Answer: Tropical Queries	308
Coldwater Queries	309
The Junior Sword Plant	311
An Iguana and his Vitamins	312
From a Naturalist's Notebook	313
Viewpoint	316
Product Review	318
Junior Aquarist: The Gold Barb	320
The American Flag Fish	321
New Group Plans to Encourage Fishkeeping	323
Thollon's Cichlid—Notes on Breeding	324
Marine Queries	326
<i>Chaetodon auriga</i>	328

The Editor accepts no responsibility for views expressed by contributors.

# LESSER KNOWN INDIAN AQUARIUM FISHES

## (2) THE MELON BARB

by B. F. Chhappgar

ALTHOUGH INDIA abounds in barbids, most of these are of a plain silver colour, embellished with black spots. However, there is one that has something of the brightness of colour and the general appearance of the tiger or negro barb; this is the melon barb—*Puntius melanampyx*. As it is docile, many aquarists prefer to keep this in a community aquarium rather than the fin-nipping tiger barb.

Common in the hill streams of Kerala (south India), these fishes have a reddish body with black bands at several places. An irregular black patch is present on the opercle behind the eye. The broadest black band is found behind this, followed by another broad stripe below the base of the dorsal fin, extending to a little below the middle of the body. Another black band is found slightly behind this, at a position above the anal fin but extending only slightly below the lateral line. The root of the tail bears a vague light black thin stripe, but this may sometimes be absent. In the male, the dorsal, ventral, and anal fins, as well as the tips of the caudal fins, are black.

Although found even in streams at a lower level, the melon barb appears to prefer the upper stretches. Forms in the hilly forest streams are generally brighter and are very abundant, occurring in large shoals. Lower down, in the plains, they are of a paler colour and are found only three or four at a time.

These forms are easy to breed, showing the typical barb breeding behaviour. The mature males can be easily distinguished by the presence of tiny pimples on the snout. The males drive the females very hard until they come together, pressing their bodies side by side, and the eggs are released accompanied by a quivering of the body. Spawning may be done in loosely clumped fine-leaved plants, in boiled coir (coconut husk) fibres, or a nylon mop.

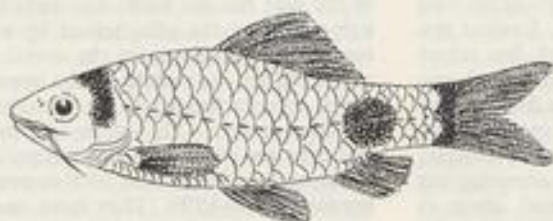
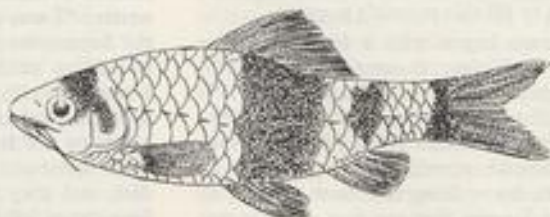
A variety of the melon barb is found in the eastern regions of the Indian peninsula. This differs from the typical form in that the black band below the dorsal fin in the male is broader and extends more below the lateral line, while the band in front of this is absent. This variety of fishes, collected from Kodaikanal Lake, is supplied by the Fisheries Department of the Madras State, under the name of melon barb (derived from the scientific name *melanampyx*). The fish is even easier to breed than the typical variety.

A third variety of this fish is found in the extreme south, near Nagercoil, only 20 miles above the southernmost tip of India. Collected by Mr. S. R. Sane, who first popularised it as an aquarium fish in the early sixties, the female is similar to the typical melon barb, but the male differs considerably. The black band below the dorsal fin is completely absent, while the black band above the anal fin is abbreviated into a spot. In some males, this spot may be almost completely missing. This fish is popularly known as the ember barb, but it is only a subspecies of the melon barb. Unfortunately it is very difficult to breed, the males being highly pugnacious and tending to drive the females mercilessly.

In Ceylon, home of the cherry and negro barbids, the melon barb has lost the barbels below the chin, but is otherwise similar in colour to the typical Indian variety.

The melon barb has very recently been discovered to occur as far north as Goa, only a few hundred miles south of Bombay. Not much is known of the form here, but the black bands do not appear regularly as in the other forms. These forms show more sexual dimorphism in colour than the other varieties. Thus the male tends to have a pinkish body, while the female

is more yellow. Again, the stripe above the anal fin, which extends from top to bottom in the young, fades out in different manners in the two sexes. In the male, it starts fading out at the top, leaving the black stripe in the lower two thirds of the body. In the female, however, it fades out on the ventral side, so that the stripe appears to start from the top and extend downward two thirds of the body. Finally, in large males, the space between the two black stripes (that below the dorsal fin and that above the anal fin) also shows a diffused black patch. The diffused part even extends forward of the black stripe towards the opercle.



These four illustrations show how the different populations of the melon barb in various localities have evolved gradually decreasing number of stripes.

Top shows the typical form, from Mysore, with three prominent stripes, and two lesser ones on the gill-cover and tail.

Second from top is the form from Kodaikanal, where the first prominent stripe, the one behind the gill-cover, has disappeared.

Third from top: the Cape Comorin strain has lost the second bold stripe (below the dorsal fin), so that only the spot above the anal fin remains. This, too, fades out in adult males.

At bottom is the stock from Goa where, in adults, all the bands coalesce to form one huge blotch.

# WHAT IS YOUR OPINION?

by B. Whiteside, B.A.

Photographs by the Author



I WOULD LIKE to express my regrets to those of you who may have been disappointed to find that the regular list of topics for future discussion did not appear at the end of my feature in the August issue. Unfortunately, some last minute publishing difficulties caused it to be omitted. Fortunately, I have still more than enough letters to fill this month's pages.

The August feature began with a letter directing criticism at Mr. V. G. Knight; it came from Mr. I. D. Taylor. Mr. Knight, in his own defence, replies: "I must defend myself against the points made in Mr. Taylor's strongly-worded letter. First, I believe I may have already vindicated myself of 90 per cent of Mr. Taylor's wrath by writing the neon article, as you requested; and I agree that my first attitude was selfish and stupid. However, in case your editor does not think my article is of sufficient merit to publish—after all, I don't profess to be a writer!—I would like to clarify some points for Mr. Taylor. From the two spawnings, mentioned in my first letter, I raised not two neons, as Mr. Taylor seems to think, but raised sixty of them to maturity. The only fatalities I saw throughout were two that died during the first transfer and two others that I don't think I even mentioned in the article as I didn't think it sounded very plausible; however, it's true. My wife and I were admiring our baby neons; a large *Planorbis corneus* snail, about as big as a 2½p piece, was sucking the glass at the water surface; a fry was approaching from each side—and both were sucked in! I won't be using snails again in my fry tanks. I think I can congratulate myself on my first successes. Had Mr. Taylor read the letter correctly he would have noted '... two swimming ... plenty back on the glass ...' I was trying to emphasise that I hadn't known other fry return to the hanging position so many times. A final, pleasing note on my neons: my own young fish have indeed proved easy to spawn and hatch. I get fry from about 80 per cent of the set-ups, proving just about the easiest fish to spawn. Who knows, perhaps one day even Mr. Taylor may allow me my 'hour of glory!' I wonder if any reader has any experience of, or information on, the use of ozone in freshwater tropical tanks. This would be very much appreciated—particularly its use against bacterial infections." (I think Mr. Knight deserves our congratulations on his successful spawnings. I'd

be pleased to hear from anyone else who has been able to match his success.)

No. 5 East Hall Lane, Cherry Orchard Estate, Murston, Sittingbourne, is the address from which Mrs. E. M. Kerridge writes—and it's pleasant to receive a letter from a lady reader. Mrs. Kerridge writes: "I was pleased to see the article on veiltails in the September issue as I feel that not enough attention is paid to coldwater aquarium fishes. For instance, I keep bitterlings and only once have I read anything about this colourful little fish. It is true that those seen in shops are hollow bellied, drab creatures; but get them home and into a well planted tank, with a varied diet, and they become transformed. I feed mine on four types of food, including freeze-dried shrimps, and they are as colourful as many tropicals. Both sexes are a shimmering silver, with a blue sheen on the back, and a blue horizontal stripe from the middle to the tail; but the males also have two vertical blue stripes behind the gills, joined by a red flush. The top of the eye, the tip of the dorsal fin and the root of the tail are red; while on the upper lip is a raised, white moustache—which I thought was a fungus infection at first! They grow to a maximum of 3 in. and thus are ideal for the aquarium. They can stand a temperature from below 50°F to over 80°F, but seem happiest at 60-65°F. They have one fault: they are very nervous and will dash themselves against the sides of the tank when startled; and will sometimes remain in a trembling, trance-like state, squashed in a corner, for fifteen minutes or more. Because of this, they can damage themselves and are then prone to attacks of fungus. This is easily cured by any of the fungus remedies, but I can recommend 'Off It' by King British, and 'Liquisil' by Interpet. I do not have rocks in the tank as these would be an invitation to fin and body damage, due to their nervousness; so the tank, as I said earlier, should be well planted to give them hiding places. I have read that bitterlings breed by laying their eggs inside a freshwater mussel. However, I understand that in the aquarium the mussel would die through lack of food. I can find no more information on this and would be grateful to hear from anyone who has tried to breed these fish. I would like to know if any of your readers have had any experience with fish that seem to mope more and

more until they quietly die—although they are not old and everything else in the tank is thriving." (It's some years since I saw any exotic coldwater fishes. Are they as popular as they used to be?)

"I suppose that it is inevitable that some readers would believe that writers to your feature do so to gain personal publicity. For the benefit of new readers, and perhaps to refresh the memory of others, names and addresses are published to enable readers to correspond with writers, if they so wish. To take a realistic view, writers do gain a small measure of personal publicity; this is unavoidable." These are the opening lines of a letter from a regular contributor, and I think he makes a perfectly valid point. There must be very few people—even professional writers of many years standing—who do not get at least a tiny thrill when they see their names in print. The writer continues: "In my opinion publicity, unless it is accompanied by monetary gain to compensate for the effort expended in gaining it, is of doubtful value and certainly not worth the cost of the postal expense involved. Obviously writers do have a motive for writing letter to W.Y.O.—that is to impart information relevant to the hobby; as well as to air opinions on these topics in the belief that some of the information presented will be of interest and, possibly, of some practical value, to readers of this magazine.

"Unfortunately aquarists, once they have used potassium permanganate to disinfect their aquarium plants outside the aquarium are only too ready to use it inside the aquarium, especially when apparently this chemical has done its work well in cleaning the plants. Many chemicals will react differently under certain circumstances. When this happens they become unstable and therefore are detrimental, often lethally so, to many aquatic plants and to some species of fish. Potassium permanganate comes into this category. Before using this chemical, it is advisable to switch off all aeration or filtration systems; and in addition all dirt and mulm should be removed from the aquarium. This chemical has sometimes been used to clear blue/green algae from aquaria. If the chemical is used for this purpose then I would suggest that if it is possible to do so one should remove all fishes to another tank before this chemical is used; and not to return them until the aquarium is safe for further use." This letter reached me from Mr. S. Fox, of 126 West Farm Avenue, Longbenton, Newcastle upon Tyne NE12 8RU, and it recalls to mind a rather tragic story recounted to me by a fairly new aquarist. He ordered 250 young neons from his local dealer for a display tank. The neons, when placed in their new tank, appeared to be infected by some disease, so the aquarist asked the dealer to suggest a cure. The dealer gave him a tin of potassium permanganate crystals and told him to add a couple of handfuls of the substance to the neons' tank before going to bed, and the neons

would be cured in the morning. You can imagine what happened. In the morning the tank contained a solution that looked like purple/black ink—plus 250 dead neons! The incident needs no comment from me . . .

"About three years ago my son had an aquarium given him for Christmas and I promised to buy him some fish. Needless to say I ended up with twelve tanks after the fish bug had bitten me. I was more interested in the breeding of fish and my first attempt resulted in 80 perfect zebra fish. I bought a copy of Derek McNerny's *All About Tropical Fish*, and it was mainly the Characins which fascinated me. His instructions on page 252 made breeding neons sound simple, so I set about it. I used rain water from the garden shed roof, which I collected in a plastic dustbin. I bought a bag of garden peat and threw this on top of the water. After three weeks I siphoned 6 in. into a small plastic tank which had been cleaned as directed. I had about 10 neons and 10 cardinals; the males and females were always kept separate. My fish were fed on all sorts of food—flakes, *tubifex*, kitchen scraps and tinned dog meat which they all loved—especially my discus. At about tea time I selected a very plump female and two males and put them in the tank.

"Very early the next morning I got up and the neons were spawning, both males chasing the female. After about three hours I removed the fish. Next morning many of the eggs were white, but I could see other fry hopping about. I fed them on *infusoria* from a tube and my first spawning resulted in 20 adult fish. The next time, after two days, the fish had not spawned so I added another two fish. This time I had 74 babies. When they were one week old, I foolishly transferred them to a small tank containing tap water—and lost every one of them. By the way, with this spawning I fed the adults, on the second day in the spawning tank, with dog meat, and they still spawned the following day. I tried five more times. On three occasions the neons did not spawn; so after five days I removed them and put in the same water five glowlights—three males and two females. These spawned on each occasion much more easily than the neons and in all I had 100 lovely glowlights. These I sold to my local shop. I tried black neons and had six adults out of the one spawning. My last attempt at spawning this group was with cardinals. I used exactly the same method as before, and this resulted in 18 babies. I sold these when  $\frac{1}{2}$  in. long. I then started fulltime work and found I did not have time to keep my tanks properly and could not be at home to keep an eye on the spawnings. My tanks are now in the garage and a friend has kept some of my fish. I still take *The Aquarist*, and my advice to would-be neon breeders is to follow Mr. McNerny's instructions exactly and you can't go wrong. P.S.—My one big disappointment was not being able to breed my favourite, the bronze

catfish." The above letter came from yet another lady reader, Mrs. Marlene Gee, of 51 Broadwood Road, Bestwood Park, Nottingham, and she also deserves our congratulations on her successes with breeding Characins.

Mr. A. Rennie, of 89b Buckingham Road, Cheadle Hulme, Cheadle, Cheshire SK8 5NQ, writes in reply to a reader's query about published articles dealing with the emperor tetra. Mr. Rennie writes: "On looking through my files I have come across the following references: Goatcher I, Vol. 30 No. 3, June 1965, page 39; Hems, J., Vol. 32 No. 4, July 1967; Hems, J., Vol. 34 No. 11, February 1970, page 332; Thomas, M. and Ravensdale, T., Vol. 32 No. 3, June 1967; and Thompson, M. E. R., Vol. 30 No. 4, July 1965. I do not claim this to be a complete list but I hope it is of some help."

My remarks about my spawning of pearl gouramies (August issue) brought an amusing letter from Mr. M. Auckland, whose home is at 202 Queensway, Grantham, Lincs. He writes: "I had a pair of pearl gouramies in a community tank and, after seeing the female fill up with eggs and the beautiful colour change in the male, I thought I would have a go at spawning them. I introduced the pair into a 36 in. x 9 in. x 9 in. tank which contained only a few small Indian fern floating on the surface. Almost immediately the male started to build a bubble nest and within two days the pair had spawned. The temperature was 76°F and the water fairly hard as I live in a limestone area. Within about three days I could see small, black specks in the nest, and when a bubble burst father fish caught the baby, before it had gone very far, and blew it back into the nest—watched by an enthralled audience of wife, kids and myself who, being the proud owner, told them all, with much muttering, to keep quiet and not jump about. My wife got fed up with hearing me say it many times over. After about two weeks my dear wife said that we were going down to see my parents, for a holiday, and told me to stop muttering for a few days. So, being a first time foster dad on this lot (the fish) I put all that I could catch in a large, floating, plastic dish, not trusting what the book said about the parents not eating the fry. With a few squirts of Liquifry in the dish, some in the tank for the babies I didn't catch, and a vacation block for the parents added, I went unhappily on holiday. On my return a very anxious look in the tank revealed that not only had the babies left not been eaten but that they had doubled in size compared with those in the dish; so all were put in the tank together. When the fry were 2 in. long, all in turn developed a clouding of the eyes. However, it cleared up without any apparent harm to the fish—which then numbered about forty and had been moved to a bigger tank. The wife, as wives do, once

again decided on another visit to my parents, and filling the meter up with shillings, away we went.

"On our return I found that, due to the colder weather, the electricity had run out, leaving me a sorry soul with three tanks of dead fish—with the exception of five sorry-looking swordtails, all but dead, and a none-the-worse Japanese weather fish. (I have now had a quarterly meter installed!) There must be a moral here somewhere. P.S.—I have now converted the outside shed into a fish house and have started again."

While on a recent visit to London I made a return



visit to the home of Mr. Douglas Rose for a brief look at his aquaria. I was most interested to see that his large, marine aquarium looked as attractive as it had done much earlier this year, and that the marine fishes were all alive and that bit bigger than they had been on my previous visit. One of Douglas's freshwater, tropical tanks had been stocked with a large shoal of cardinals and was beautifully decorated with dozens of healthy plants obtained from the Everglades Aquatic Nurseries. Under Gro-Lux lighting the fish

and plants made a delightful sight—and indeed the tank was one of the most beautiful aquatic sights I have ever seen. Douglas's other tank, which was also attractively planted, housed a pair of piranhas and a single zebra. (The latter, being a very fast mover, had managed to escape the jaws of the piranhas.) I was amused to see Douglas feed the piranhas on small pieces of raw, red meat as he introduced the meat to the fish using his own form of blowpipe! Although I found the piranhas interesting, I did not find them very attractive. However, everyone to his or her own taste.

This account provides an appropriate lead into a letter from Mr. P. Sealey, who lives at Flat 6, Peartree Court, Meriden Estate, Watford. He writes: "In October, 1973, I purchased what was, according to the shop owner, a baby piranha—*Serrasalmus rhombus*—of about the size of a 10p piece. Initially I put it into my 48 in. x 15 in. x 12 in. tank, thinking that at that size it would not be too aggressive. A few tail-less fish later I put in a divider, giving the piranha a 20 in. section. Next day I discovered a scissorstail had somehow been left in with him. This state continued for about six weeks and by this time the piranha was about 3 in. in length and growing fast on a diet of beef heart, mackerel, lamb's heart and occasional dried food. I had no doubt in my mind now that my fish was *S. nattereri*—the red piranha—so I changed things around and gave him the larger side of the tank. Although no undue chasing or panic occurred (luck!) in netting him, he lay flat on his side, dead still, at the back of the tank. A considerable time had passed when my 11 years old daughter, who had by now taken an interest in events, said: 'Put the scissorstail back in with him.' I put both scissorstails I had in with him and promptly he began swimming around as if everything was fine. Two days later he had eaten one of them, but his friend, whom I recognised by the unusual shape of its top fin, and whom he appears to know in his own way, continues after nearly a month to swim around quite happily with his crazy but fascinating friend. I have an 18 in. x 10 in. x 10 in. tank in the hall. It contains a small, green shore crab, two shrimps and about six beadlet anemones of around 1 in. in diameter. I have just noticed that I have now got some baby anemones of about 1/4 in. in diameter. I enjoy your magazine as a whole, and while realising how much all reading material today relies on advertising, I wish we could have more articles."

Mr. G. Garioch lives at Boulsworth, Gibfield Road, Colne, Lancashire, and although he has not been a tropical fish hobbyist for long he now has twelve tanks. He writes: "This may sound grand but the truth is that I made most of the tanks myself, using shopkeepers' redundant glass shelves—beautiful plate glass with polished, round edges—and silicone cement. My main aim is to try and breed a coloured, female guppy. While on holiday recently I had a friend feed

my fish for me; and on my return was aghast at the state of my blue acara tank. It was filthy! Hurriedly changing them to another tank next morning, I was amazed to find a spawning of 200 plus eggs. Four days later they hatched. (I had removed them from parental care.) About 75 young were seen. Today, eleven days later, they are 1/2 in. long and thriving. The water was very hard with a pH of 7.4 and temperature of 76°F. This is galling because I have been unsuccessful in breeding zebras. There seems to be some confusion about the proper name for the blue acara, one book calling it *Aequidens latifrons* and another *pulcher*. Perhaps you could elucidate? Incidentally, there has just been another spawning from the acaras, and this time I shall endeavour to leave them with the parents. I enjoy the magazine enormously and your feature in particular." (As Mr. Jack Hems is the leading authority on the nomenclature of tropical aquarium fishes, I looked up "blue acaras" in his latest book, *A Guide to Freshwater Aquarium Fishes*, by George F. Hervey and Jack Hems. Its correct name is given as *Aequidens pulcher (latifrons)*. Thus it would appear that both names can be used, the second in parentheses.)

No. 5 Ednam Drive, Macedonia, Glenrothes, Fife, is the address from which Mr. A. Muir writes concerning the hatching of cichlid eggs away from parent fish. "I have had success with three specific cichlids, the first and most difficult being angels. The parents are good spawners but continually eat the eggs. Whenever they spawn I remove the eggs and place them, complete with leaf, in a 24 in. x 12 in. x 12 in. tank, complete with gravel but without plants. An air stone, providing slight aeration, is placed next to the leaf bearing the eggs. The tank is treated with methylene blue to prevent disease and excessive egg fungus. The temperature is increased to 82°F; the eggs hatch in 36-40 hours; they look rather like a jelly mass; they are attached to the leaf by a thread which is on the head. The yolk sac is absorbed in approximately three days. I find the most crucial period to be between then and the time the pointed dorsal appears. If not cared for properly fry losses can be great. Feeding the fry is difficult; I find the best feeds are brine shrimps, Liquifry and egg yolk until the cichlid shape is apparent. I have had fair success with this species but I have been unable to get any more than 50 per cent of the fry raised from one spawning. I would be most grateful if anybody could give me advice on increasing the spawning." (The photograph shows one of my angels spawning on an Amazon sword leaf.) "The latest spawning of my pair of adult angels took place, last week, on the centre of the front glass of their 24 in. tank! When the pair had laid about 400 eggs I left them for a short time to have my supper. When I returned, all the eggs had been eaten by the parents!

(Continued on page 301)





#### White-Clouds in York?

While on holiday recently, I spent a few days in York, and, while there, took a walk along the bank of the River Foss, very near where it joins the Ouse.

In the water I noticed large numbers of tiny fish, evidently feeding at the surface, and took a closer look expecting to see minnows or sticklebacks. The fish appeared to be about 1½ inches long, with a light stripe along the back, on either side of the midline, and a reddish tail. Unfortunately, I had no means of catching a sample for closer examination, and was unable to come back later. However, looking from above, the fish certainly looked very like white-cloud mountain minnows (*Tanichthys albomber*).

As these fish will survive quite low temperatures, they are certainly capable of existing in British waters. They could have been escapees from an outdoor pond, breeders' discards, or deliberate introductions, but the numbers present certainly suggested an established breeding population in the river.

Perhaps one of your readers in York can confirm that these fish are, in fact, white-clouds and whether or not deliberately introduced, or alternatively, identify the native species which I mistook for white-clouds!

It would also be interesting to hear whether there are any other records of aquarium fish becoming naturalised in the wild in Britain.

GEORGE D. RODGER,  
40 Esslemont Avenue,  
Aberdeen AB2 4SP.

#### A Satisfied B.C.A. Member

Almost half the questions in your excellent "Tropical Queries," by Jack Hems, are concerned with cichlids. Are the thousands of your readers aware of the many advantages of being a member of the British Cichlid Association?

Over 12 months ago I wrote to your column complaining about the difficulty I had in joining the B.C.A. I learned through a very nice letter from them that their secretary, because of domestic difficulties, had to resign and they were in the process of appointing a replacement.

I have been a B.C.A. member for 12 months now, and I am pleased to belong to such a well-run and promising organisation. Since becoming a member, my knowledge of cichlids has steadily grown through meeting and writing to members, also with a good deal

of help through reading the B.C.A.'s excellent publication, the "Cichlid Clarion."

There are Area Representatives all over the U.K., even one as far away as Australia, who are always ready to help new members.

Certain areas hold monthly meetings and always welcome new members. Areas I know of with their own meetings include the North-East, the South, Nottingham and the West Midlands.

So, may I say to anyone who is interested in learning more about caring and breeding the cichlids, also meeting people of the same interest, why not join us?

For further information write to our membership secretary: Mr. P. N. Berry, 131 Sherbrook Road, Daybrook, Nottingham NG5 6AS.

J. REEVES,  
36 Peter Street,  
Hill Top,  
West Bromwich,  
West Midlands B70 0HT.

#### Who Knows?

Surely every exhibitor in this country is a brother or sister of sorts; why is it then, when we visit different shows, we are confronted with different sets of judging rules? I refer in the main to F.B.A.S. and Severnside. What I would like to know is: Who is right?

Don't let's beat about the bush, when exhibitors win at shows of either Association, the judging is great, when they lose the judges are lousy, you can hear this story wherever you go, especially from the "pot hunters." There are many of us believe it or not, who actually go for a day out to shows, to enjoy ourselves and hear the views of other people.

The F.B.A.S., rightly or wrongly, have tried to get the two sides together and in doing so both sides have expressed the view that they are right. I wonder if anyone has thought that there's right on both sides? The only answer is to get both committees together in a field, supply them with judges' sheets and let them beat each other over the heads until someone emerges winners.

Kidding aside, when are the Associations going to realise that without exhibitors there would be no need for Associations? Did I hear a sigh of relief from committees all over the country? How about some unbiased members of both associations meeting on neutral ground and having a conference, sharing costs, views and ideas? Who knows, something may come out of it, if only a pint! Who knows, we may find out that both Associations are wrong and then, where will we stand?

So come on; instead of talking about it, let's do something.

DICK RICHARDS,  
Rhondda—F.B.A.S.—C.N.A.A.

### Information Pool

One of the major problems facing marine aquarists at the present time is overcoming the difficulties presented in the propagation of marine fish, both native and tropical. While many aquarists have managed to achieve spawnings, very few have raised the fry to a mature stage. Perhaps it is for this reason that they are reluctant to write down the knowledge they have gained for publication in the various aquatic magazines.

In order to overcome this, the British Marine Aquarists Association has, through the initiation of one of its members, Mr. Martyn Haywood, prepared a simple questionnaire which covers all the factors likely to influence the successful breeding of marines. We would be grateful if any readers of this magazine, both in Britain and overseas, who have spawned marine fish would write to me at the address below and I will forward a copy of the questionnaire. Through the completion of these we hope to be able to determine some factor common to a number of spawnings and this information could be made available for the benefit of all aquarists.

I would stress that we are interested in obtaining this information whether or not the fry were reared successfully or even hatched from the eggs. Thanking you for your assistance in this matter.

GRAHAM C. ROBERTSON,  
88 Cornhill Road,  
Aberdeen AB2 5DH.



"Just to make things worse, my piranhas have escaped!"

## What is your opinion? (continued from page 299)

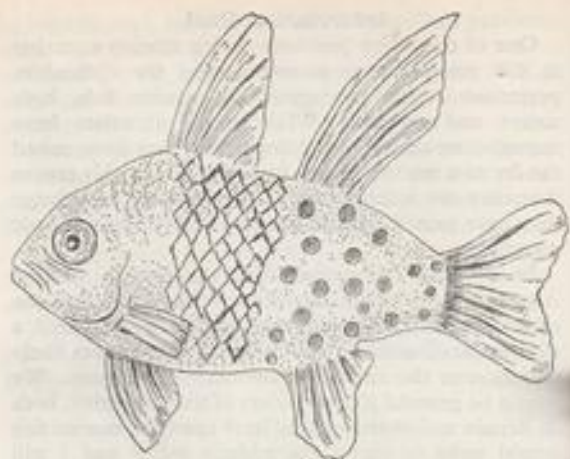
Recently my female angel developed a slight cloudiness over one eye. In an attempt to improve the condition, I added an appropriate quantity of a branded 'cure' to the tank in which she was housed. The 'cure', which indeed did eventually cure the condition, contained one of the common dyes used in such preparations. I was interested to note that the blue/green colour dyed some fairly large areas of the clear parts of the fish's fins—and the fish still has blue patches on its fins well over a month later. The effect is quite pleasing and appears not to have affected the fish in any other way. Have any readers ever attempted to change the colours of specific fishes using dyes? If so, I would be pleased to hear from them. I've heard suggestions that some brightly coloured discus may have been dyed. Does anyone have any evidence of such dyeing processes having been carried out?"

For a future edition, please send me your opinions on the following: (1) How much light, from what

sources, and of what duration, do you supply to each of your tanks daily? Do you increase the time during which lights are kept on in winter? (Please give tank sizes, and plants and fishes which thrive, in your replies.) (2) What have been your experiences with the water chestnut plant—*Trapa natans*? (3) In what sort of container do you breed white worms, what mixture of compost do you use, and on what do you feed the worms? (4) How do you hatch brine shrimps? (5) What media do you use in your outside filters, and why? (6) What is the largest number of babies you have raised from one spawning, and what was the species? (7) What special provisions do you make, in connection with your garden pond, in winter? (8) What forms of filtration do you provide in your marine aquaria? I look forward to receiving a letter from you—particularly if you have not written before. Happy fishkeeping until next month!

# THE PYJAMA CARDINAL

by H. G. B. & Q. G. B. Gilpin



It is some years now since we obtained our first specimens of *Apogon nematopterus*, commonly known as the Pyjama Cardinal. They were installed in a 39 in. x 15 in. x 12 in. aquarium, well aerated and kept at a temperature of 75°F. Its furnishings consisted of large pieces of coral set on a base of coral sand, and carefully arranged to provide hidden retreats for fish needing seclusion—not that the four Cardinals showed any inclination to retire from view—on the contrary they spent almost all their time swimming in a shoal in the open parts of the aquarium. Cardinals have been described as shy fish but neither these nor others we obtained subsequently showed signs of timidity.

Although not resplendent in the vivid, contrasting colours of some marines, Pyjama Cardinals are exceedingly attractive little fish. They are lively and active. Their movements in the water are characteristic, alternating between sudden spurts forward and periods of comparative immobility, when they "hang" suspended in the water with their heads directed slightly downwards.

An outstanding feature is the striking, relatively large, red eye suggesting that in their native habitat the fish are most probably semi-nocturnal. This probability is strengthened by the fact that if a torch is flashed on the aquarium at night the fish quickly move into the lighted area in search of food.

The golden brown anterior surface of the Cardinal is separated from the silvery posterior end by a darker band of scales. The posterior end is further enhanced in hue by the presence of numerous red spots. The fins are wide and well spread, the ventrals being tinted with lemon. The colours are brighter in younger specimens than in adults but these too are pleasing in appearance. Our fish were approximately one and a half inches in overall length on arrival.

Mature specimens are said to reach four inches.

Pyjama Cardinals are credited with being peaceful and non-aggressive in a mixed community and this has been borne out by our own experience. We have kept them at different times in company with a Batfish, a Red-finned Butterfly Fish, a Golden Butterfly Fish, a male Mandarin and two small White-tailed Damsels. The Cardinals have continued swimming around in their own intact little group, showing neither fear of nor antagonism towards their companions, nor have they disagreed amongst themselves. Although it would not be wise to enclose them with pugnacious fish—the Damsels with increasing growth might well become suspect—Cardinals make ideal community fish. They are said to be safe with invertebrates and this seems highly probable, provided relative size is borne in mind, but to date we have not kept them together.

Pyjama Cardinals are easy to manage and maintain and apart from some difficulty, particularly in the initial stages, in persuading them to eat, they are excellent fish for beginners. Ours have always steadfastly refused to take any interest in marine dried foods. They will, however, accept frozen food with the exception of chopped frozen whitebait which they ignore. Once they become familiar with their new surroundings, and provided the condition of the water is satisfactory, they feed freely, indeed greedily, on small forms of live food including brine shrimps and the fry of small livebearers such as Guppies and Swordtails. They will also take mosquito larvae and *daphnia* which, provided they are supplied in small quantities, survive long enough for the fish to catch them. Some aquarists have found that as soon as Cardinals are feeding freely on live food they can be accustomed to tiny pieces of prawn, raw meat and earthworm.

Cardinals generally are egglayers, the fertilised eggs being taken into the mouth of a parent and retained there until they hatch. In some species the eggs are carried by the males, in others by the females and in others again both parents share the responsibility.

Cardinals are found in the East Indies, China, the

Philippines and Pacific Islands and the majority inhabit shallow waters. They commonly occur in very large numbers and are believed to form the basic food of a considerable range of predatory fish. Some few species possess light organs or are the hosts of luminous bacteria.

---

## A POND RESTORED

by B. Tench

I HAVE BEEN READING of late several articles on the misuse of Village and Farm ponds, and the good work being done through the "Save the Village Pond" campaign which, I believe, is being organised by the British Wildlife Association.

Being a keen naturalist, I have been studying the aspects of restoring these ponds to their original beauty, and I have drawn my own conclusions to the effect that once you have removed all rubbish, etc., it will undoubtedly improve the visible aspect, but with most of these ponds there is no guarantee of obtaining an even level of water, and water of a reasonably oxygenated condition. Unless these ponds are very large and of considerable depth it can be a very difficult and unrewarding task. However, after studying several survey maps of the area, I noticed that there were originally two small ponds in my own meadow, both of which had been filled in by the previous owner. This answered my persistent question of "why is this meadow always wet, even in dry weather?"

It turned out that there were two natural springs, and my first reaction was to restore them back to something like their original being, as was shown on the plans. Now the problem was, would they be like most farm ponds and dry up in the summer or would I be more fortunate? The only way to answer this question was to find the springs and excavate two test holes. This I did and the holes filled up almost at once and stayed filled for several months, so I proceeded to excavate them to their original size of approximately 30 feet by 20 feet. This done, I kept careful watch on the water level. For several weeks there was very little difference, but then, one morning, as I had feared all along, they were almost empty. Now if I had stocked them it would have been a complete disaster.

The problem now was how to keep a consistent water level. It occurred to me afterwards that it may be

possible to tap a nearby stream and on the face of it it looked feasible, as the ponds were lower than the stream, and the stream has never run dry during its existence.

Although it meant excavating a ditch across the meadow, I thought little of this as long as I achieved my aim. After digging the ditch, I found it to be a success but, never being satisfied, I made the two ponds into one and dug an outlet ditch into the stream at the other end of the meadow, so that I had constant running water.

I have since stocked it with most types of fish—Crucian Carp, Tench, Bream, Dace, etc., even a few trout, both Rainbow and Brown, the latter I do not expect to breed as the flow is not fast enough. All these fish have grown at an alarming rate, the reason being the vast amount of food entering through the feeder ditch. Obtaining plants was quite an easy task, as the river is only 100 metres away. I introduced several cabbage lilies, Iris, reedmaces, etc., not forgetting the old favourite Canadian Pond Weed which, although rampant in growth, is one, if not the best, oxygenating plant available.

The wild life that has turned up is quite remarkable. I have Kingfishers nesting in the bank, Mallards in the rough, all the birds imaginable, including the Heron, which at times can be a problem in itself.

All manner of animals turn up in the evening and early morning to drink; in fact, for me, the whole scheme has been a total success. I have approximately 700 square metres of uncontaminated crystal clear water, and I can walk down to the pond at any time of the day or night and be presented with a different point of interest every time. My next move will be to enlarge it and introduce more breeds of fish and fowl; some say, if you introduce domestic fowl they will frighten away wild fowl, but not in my experience.

# FISH-BREEDING IN COMMERCIAL QUANTITIES

by A. Jenno

IN RECENT times there has been much concern in the aquarist press and other publications over the possibility that some kind of regulation may be introduced in the near future which will stop the importation of many of our popular aquarium fishes. The reason stems, apparently, from diseases which are being introduced amongst angling stocks by infected fishes brought in from Europe and elsewhere, but it would seem that any ban must affect aquarists as well as anglers because of the close relationships existing between many of the species imported by both groups and the difficulty of separating, in a properly worded regulation, the two types of fishes, or perhaps more correctly, the uses to which the fishes are put following their arrival in this country. Thus any new law is likely to deal in whole families of fishes and would cover many species which could never conceivably be anglers' fishes, for instance, the small barbs which are related to roach and bream. The obvious loophole, whereby aquatic importers might find themselves in a position to supply quantities of, say, imported common carp to fishing organisations after any closure of these latter's normal channels, would surely be catered for, so that there is not much chance of the aquatic trade escaping the regulations. Of course, it may be that aquatic stocks are also contributing to the present state of affairs, so that any ban might easily be justified in our own circles. Certainly, the condition of many imported goldfishes and livebearers in recent years has been anything but commendable.

This then leaves the amateur breeder in a somewhat advantageous position if he is prepared to adapt his ideas towards the concepts of quantity and regularity of production, whilst still maintaining the quality of the fishes for which serious breeders in this country are generally well known. Apart from the above-mentioned restrictive possibilities, the aquatic trade is also presently suffering from other difficulties such as increased air freight rates and currency conversions, so that in any event it would seem that home-bred fishes could now become more attractive to the trade

than in the past. I think that the potential superiority of home produced fishes has never been in doubt at any time, except where truly wild specimens are needed for various reasons, but because of ease of commercial operation the trade has come to accept that even the easily bred fishes should be bought initially from importers, even at some sacrifice in quality and health. Again, economic pressures have also meant that many dealers and wholesalers do not properly quarantine fishes before sale as used to be common practice, but simply turn them over as fast as possible so that any unseen illnesses present are passed on down the line to the final buyer who has no guarantee at all that he is purchasing completely healthy fishes. Undoubtedly many of these economic difficulties are derived from the fact that some of our fishes are nowadays sold so cheaply, for instance neons, platies, zebras, and particularly small goldfishes, that individual attention is no longer financially practical and any treatment is only administered when a significant proportion of a batch is affected.

Therefore, given the above arguments, it would seem that a time is approaching when there may be a considerable change in the attitude of many dealers towards home-bred fishes, and that these may even become generally wanted in the trade in preference to imported specimens, even if these are still available. The amateur breeder may thus be poised on the brink of a rewarding opportunity if he is prepared to adapt his methods into routines which suit quantity production and cater for the requirements of the aquatic retailers.

There are, of course, some commercial breeders already in existence in this country, including a few very large establishments, but generally the good amateur breeders do not tend to develop towards commercial enterprises and so much potential is lost. The trap which many good breeders do fall into is that of back-door and garden shed retailing operations whose legality is doubtful and whose rewards are not always as good as could be obtained in other directions.

As in any other business, the breeder wishing for a definite profit, or even just to pay the expenses of other non-productive aquatic exercises, must be prepared to commit himself to discipline and routine. It is not possible to sell in quantity species which are of no interest to the final buyers (i.e. other aquarists), nor specimens which are of indeterminate age and health. It is necessary to breed virtually by arrangement with a retailer or wholesaler (according to quantity), and to be prepared to concentrate on just one species, or perhaps two or three if extensive facilities are available. The return per fish may be lower than that received from private selling to friends and acquaintances but the quantities moved can more than compensate for this. Thus we can see why a change in attitude is required, and the prospective commercial breeder must learn to think in different terms.

Let us then think about the production of quantities of a single species of fish for sale to the trade in minimum quantities of, say, twenty-five in a batch. In order to demonstrate a system we must make some assumptions, so for the purposes of this particular exercise suppose we are breeding a species which will sell readily in quantity at ten pence each, and that we require an income of fifty pounds per week. By simple arithmetic this gives us a production rate of five hundred fishes per week sold. Suppose also that the fishes require ten weeks after birth to grow to saleable size, so that at all times we have a minimum quantity of five thousand fishes to look after. The first conclusions then become obvious, i.e. that this operation is unlikely to succeed if carried out inside the normal domestic household, and that a proper fish-house facility is essential. The size of the finished fish-house will obviously affect the number of aquarium containers included and these will determine the number of fishes which can be kept, so in our example we must begin at the other end and acquire facilities suited to our needs. Generally, it is possible to raise most of the very popular fishes such as small livebearers, barbs and characins at the above production rate, i.e. saleable size in ten weeks, at a stocking density of twenty-five fishes per square foot of water surface area with proper feeding and environmental maintenance. Thus for five thousand fishes we need two hundred square feet of water surface area. As a further assumption, let us say that we are able to equip the fish-house with aquaria or other containers sized four feet long, one and a half feet wide, and a foot deep. Each of these has a surface area of six square feet and so will hold one hundred and fifty fishes. Depth does not seem too important in the growth of young fishes so a foot is a convenient size for the aquarist to work with and enough to allow the fishes room to manoeuvre, and stimulates shallow areas found in natural waters where fishes grow up. We

can now calculate various other figures. We would need thirty-four of such aquaria or their equivalent, they would hold in total about twelve hundred and seventy-five gallons of water and this water alone would weigh a little under six tons. The total cubic volume of the aquaria would be two hundred and four cubic feet and assuming that with suitable racking and allowances for walkways and vertical spaces between aquaria we could achieve a figure of twenty-five per cent of the fish-house total volume occupied by aquaria, which is all that is probable, then we need a building of about eight hundred and fifty cubic feet capacity. If three aquaria are mounted vertically up a six foot wall, we have left a calculated floor area of approximately one hundred and forty square feet, which is equivalent to a good sized domestic garage.

Thus we have an answer to the initial problem, the size and capacity of the required fish-house. Very many fish-houses of this size and larger are already in existence and the establishment of such a facility is not beyond the capabilities of a good breeder. A well-constructed building with a strong floor and good heat insulation is needed, and once the basic services are installed, its content of aquaria and fishes can be built up over a period of time if necessary with profits earned from the initial stock. The question of heating and insulation will be found to be one of the prime influences on the profits made, and in the usual British climate every attention must be given to this subject. Nowadays we have the advantage of a good, easy-to-handle, non-hygroscopic insulator in thick polystyrene sheeting. This can be cut and fitted by anyone and bought at reasonable prices. For the walls, a thickness of two inches is recommended in a tongue-and-grooved wooden building, or one and a half inches in a brick building. Ceilings must be better insulated still because heat rises and is most easily lost at the roof. It is usually sufficient to fill in between the joints with one layer of insulation such as the fibre glass wool supplied for attics, and then to build a false ceiling of hardboard or similar sheet on which a layer of polystyrene can be mounted. Any existent windows in the walls can be covered in by a double layer of polystyrene and the inside of the entrance door can be covered also. All draughts must be stopped up and the door must close effectively. Whilst fitting the insulation, it will be necessary to install various wooden runners to take electrical fittings, lamps, pumps, etc., as nothing can be mounted onto the polystyrene surfaces due to its inability to hold nails and screws properly. Therefore the various services should be planned and laid out before the insulation is fitted. Heating is the most important service because of its regular cost, so any effort made to achieve an efficient flexible system is extremely worthwhile. There are three basic methods: space heating, base heating, and immersion heating. The first method uses fan heaters,

radiators or convectors to heat the whole of the air in the room and then the aquaria by transference. The second method uses hot water pipes or ducted air or electrical heaters under the bases of the aquaria in externally insulated channels and heats them more directly, but again by transference. The third method uses the familiar electrical immersion equipment to heat the water directly. It is possible to argue for ever and a day on the various merits and inefficiencies of these different systems, but in my own opinion it would seem better to heat the water directly inside the aquarium, than to produce the heat outside and then persuade it to warm the water. The other advantage of immersion heating is that the aquarist is likely to experience a lower ambient temperature in the fish-room itself, so that it will be easier to work there and remain inside for long periods of time. Many fully-insulated fish-houses with space heating sap the strength after about ten minutes, so that the owner does not actually spend much time in them at all. Immersion heating does of course involve the purchase of a separate unit for each aquarium and the provision of numerous electrical sockets for their use, but the system is very flexible in that individual temperature control is possible, and unused aquaria can be turned off completely. Nowadays the combined heater-thermostat unit has improved no end and can be recommended for its ease of installation and the fact that other inconvenient cable junctions are eliminated. We thus need one electrical output for each aquarium heating unit and hence a fairly complex wiring system. Our final concern on the matter of heating will be to provide such a system capable of distributing the necessary current. Assuming a start from a cold ambient temperature with all of the heaters on simultaneously and say of one hundred and fifty watts power each, which is fair enough in a fully insulated room, we have a possible total heating current flow for the thirty-four aquaria of around twenty amps. This kind of large current flow will not occur continuously, of course, once the aquaria are warm (and if the insulation is effective), but we must cite the worst case, i.e. arising from cold, so that we provide for this eventuality should it ever be present, as for instance after a long winter power cut. With lighting, air pumps, etc., we shall need a power supply with a total capacity of, say, thirty amps, as is fitted in modern houses for use with electric cookers.

So we now have a fully insulated fish-house with an efficient electrical supply and sufficient volume to hold the required number of aquaria. It will also need a water supply, drainage, lighting and ventilation. These facilities need not be fully discussed, being simply common sense, and can be fitted as and when needed. A small fan can be used for air-changing and its use will inevitably result in some loss of heat from the room, so its exhaust should contain a heat trap of some kind,

if possible, and the air intake will also need consideration.

Let us now assume that the fish-house is built and equipped so that we can discuss what happens next. The whole secret of growing up baby fishes in quantities lies in the already-mentioned properties of discipline and routine. It is foremost a seven-day job. Someone must feed the fishes properly and often enough on every day of the week without fail. The other routines, those of cleaning, water changing, etc., can be organised into a five-day week if required, but feeding must be practically continuous because this is the way young fishes feed in nature and so their body growth will only be best when these expectations are met. Water changing is another frequent routine. Even with the most modern environmental cleansing methods, there are effects upon the water in a closed system which we do not yet fully understand and certainly cannot control, for instance the production and addition to the water of the growth-regulating substances called Pheromones by the fishes themselves. Thus there is always a need for the dilution of the water in which the fishes live, and in some circumstances this may need to be at a rate of up to twenty-five per cent weekly. These kinds of jobs are not difficult to do, or very demanding, but they do run away with valuable time and tend to impose a rigid routine which the aquarist may not wish to keep to. Unfortunately, in a quantity breeding situation these routines must be met because if one batch takes a week longer to grow up, through slipshod methods, then all of the other batches coming along behind may be similarly retarded so that the whole system runs at reduced efficiency and hence, of course, less profit.

We can consider a single fry-raising aquarium and its setting up for optimum efficiency and minimum maintenance. We can keep to the previously decided container size. The most easily applicable and efficient cleansing method at the present time is undoubtedly the biological subgravel filter. If such a system, with a minimum two-inch depth gravel bed, is fitted in three feet of the aquarium base, this should prove adequate for the environment's needs so that the last one foot section can be left bare for feeding and easy cleaning up. The filter should be of the type which incorporates an airstone into a wide lift tube, or otherwise a separate airstone should be used so that the benefits of the ascending bubble column are provided. Close fitting cover glasses will maintain surface cleanliness and minimise evaporation, and each aquarium *must* have a thermometer of its own mounted inside otherwise temperature checks will never be made frequently enough, due to the sheer inconvenience of moving these instruments about and waiting for them to settle on a new reading. The heating unit has already been discussed. This should be fixed firmly in the vertical position with its head above the water level and the

cover glasses, which can have a corner cut off to accommodate this. If the aquarium is situated at any distance from an insulated wall it may be worthwhile to insulate the back, sides and base with half-inch polystyrene sheet. A minimum gap of nine inches is recommended between aquaria mounted in vertical racks to allow for hands and arms, cleaning tools, nets, jars, etc., to be used, and also for the installation of any lighting units.

The actual procedure in growing up the young fishes is fairly straightforward and should cause no trouble to a competent aquarist who does not seriously overfeed and who can successfully subject himself to the necessary routines. We can assume that anyone setting up such a system as this is already skilled in producing fry of the species concerned and that the techniques of conditioning the adult breeders and catering for the actual birth of the fry are not in question. The ideas of quantity and regularity are those which need attention here. We have said that our imagined production rate can be achieved with thirty-four four-foot aquaria, but obviously when the fry are very small the stocking density of twenty-five fishes per square foot can be considerably exceeded. This fact should allow us to substitute enough small spawning aquaria (or similar for livebearers to give birth in) for some of the proposed large ones to make a functional system in the same volume of space. For instance, we can substitute four aquaria, each eighteen inches long, twelve inches wide and twelve inches deep, for one of the larger size mentioned. Newly born fry are usually kept in their initial environment for the first two weeks, so that our minimum number of five thousand fishes present at any one time, one thousand or twenty per cent will still be in these small aquaria. This fact then releases at least six of the large aquaria for substitution by the smaller ones if needed. Let us assume that we can reasonably expect one hundred healthy fry minimum for each batch of eggs produced or livebearer fry dropped by the time that they are moved from the small aquaria to the larger ones. We need to produce five hundred per week, so we have always ten batches in small aquaria at least. Thus, if we substitute twelve small aquaria for three of the large ones we will have two spare for convenience and to ease the sterilising procedures needed with spawning fishes. The other three large aquaria can be used to accommodate the adult breeding stock and any young kept back for future use as breeders. To summarise, we now have twenty-eight large aquaria holding fishes between two and ten weeks old, twelve small aquaria for fry up to two weeks old, and the other three large ones just discussed. These figures are, of course minimum and any additions will be found useful.

Following along on our average brood of fry of one hundred fishes, and thus our need for five such broods per week produced, we can now consider the adult

breeding fishes. Suppose a pair or a livebearer female will produce one brood monthly, which is quite feasible with the common egg-layers if they are properly conditioned and looked after, then to obtain our production rate regularly we need a minimum of twenty pairs of adult egg-layers if all goes well. Thirty pairs would give more security and should guarantee that five pairs at least would be ready each week. For the livebearers, the average brood may very well be nearer fifty than a hundred so more females can be kept, but this can be balanced out by the fact that not so many males are needed, and a ratio of about forty females to ten males should do. Livebearers in their prime are, of course, likely to produce more consistently than egg-layers but not by arrangement, so females must be used who are dropping on different date cycles, else the aquarist might be lumbered with say a thousand fry one week and none the next, and the system will quickly become unmanageable if this happens. All of the above fishes can normally live in the large aquaria provided, segregated by sexes, or in the case of the livebearer females these can live permanently in the smaller aquaria if they do not eat their young. Females with similar date cycles can live together, and then the male fishes can be introduced for mating when there are no young present. It will be realised that a certain adult fish will only have a definite period in its lifetime when it will produce young well and regularly, so a programme of continuous replacement will be needed and hence the previous provision of space for the maturing of new adults. The source of these new fishes will, of course, depend upon the species concerned, but in most cases a line breeding system will inevitably develop, so the aquarist must take care to select breeders which are not too closely related and it will probably be necessary to bring in fresh blood lines from outside from time to time.

The main problem confronting anyone keeping the number of fishes involved here, will be their correct feeding. Other routines of water changing, etc., while being important as already stated, pale into insignificance beside the necessity of providing a balanced diet with sufficient regularity. The average hobbyist who grows up a few fishes for interest can easily provide everything required with a little trouble either by collection, culture or purchase. The commercial aquarist will not have the time to mess about too much, nor the cash to provide proprietary foods on such a large scale, and so must organise an extremely efficient system based on minimum effort and expense. I would suggest that wherever possible a small separate shed or room or at least a definite area in the larger fish-house must be devoted to the preparation and storage of foods. A fixed diet should be evolved by experience which suits the species concerned, and

*(Continued on page 314)*





## OUR EXPERTS' ANSWERS TO YOUR QUERIES

### READERS' SERVICE

All queries MUST be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

## TROPICAL QUERIES

by Jack Hems

A dealer sold me a fish he called a Ceylon eel. It is elongated in shape and has ribbon-like top and bottom fins and two small fins behind the gills. It refuses all dried foods and tiny pieces of meat. Could you identify this fish for me and explain why it refuses to eat the foods my other tropicals accept avidly?

I think your fish is a member of the family *Mastacembelidae*, popularly called spiny eels. Spiny eels seldom, if ever, accept anything but tiny worms (red or white), live *Daphnia*, baby fishes such as the fry of the guppy or platy, or gnat larvae. If you drop a tangle of white worms or well-washed *Tubifex* worms near to where your eel-like fish is lurking, I think you will find it will not ignore this gesture.

What is the best way to keep the mudskipper (*Periophthalmus*)?

The mudskipper requires a fairly spacious area above water level on to which it can climb. One way to provide this is to build a wall of stones or wedge a piece of well-soaked cork bark across a part of its tank and back this wall up with small pebbles or grit. Weathered tree branches minus the bark or more cork bark should be placed on the surface. The air-space above water level should be maintained at a temperature of 75°F (24°C) or above. Hence the glass cover should not have wide gaps round the edges to let in cool air. A tank about 3 ft. long will make a suitable home for a couple or trio of mudskippers. The 6 or 7 in. of water in the tank should be salty. That is, salty to the taste. Pure salt and not refined table salt should be used. Worms, spiders, stick insects, flies and the like, should be introduced on to the landing area as food. I have even seen mudskippers make side-swipes at tiny heaps of dried flake food placed on a piece of flat stone.

Please give me some information on a fish I purchased called a Japanese weather loach?

The Japanese weather loach or weatherfish is known to science as *Misgurnus anguillicaudatus* (it has a close relative living in Central and Eastern Europe called *M. fossilis*). It will stand a wide range of temperature and is quite comfortable at heated room temperature. It attains a length of about 10 in. It is a genuine scavenger fish and sifts the bottom grit for edible matter such as settled dried food, fragments of meat and various worms. It seldom molests or interferes with the life-style of other fishes but is not ideally suited to the decorative aquarium on account of its bottom-sifting habits and occasional boisterous dashes about the aquarium. For all that, it makes a most fascinating fish to keep.

I have kept coldwater fishes for several years but now I intend to go in for tropicals. Please can you give me the names and number of fishes which would live without falling out with one another in an 18 in. by 12 in. by 12 in. tank?

I recommend any of the following species: the ordinary neon tetra, the platinum tetra, the lemon tetra, the emperor tetra, the pristella, the harlequin fish, the guppy, *Corydoras aeneus* (and its albino variety), *C. paleatus*, the platy and Schubert's barb. Do not attempt to keep more than about a dozen fish in your small tank.

My 24 in. by 15 in. by 12 in. community aquarium is illuminated for about eight hours a day by a 15-watt fluorescent light, yet I cannot get plants to grow. Where am I going wrong?

Probably in your choice of plants or insufficient light or both. Try plants such as *Cryptocoryne affinis*, *Microsorium pteropus*, or *Vesicularia dubyana*. Better still, equip your aquarium with a 20-watt lamp and keep it switched on for at least ten hours a day.

#### How can I sex a peppered catfish?

If you mean *Corydoras paleatus*, then you will have to look at a number of well-grown fish and compare body shape, coloration and finnage. The female of the species is more heavily built than the male and her underparts usually show a pinkish tinge. This pink colour becomes more marked when a female is in breeding condition. Again (though you have to study the fish very carefully), the male fish usually shows more pointed and produced fins, not counting the tail-fin.

I have seen my zebra fish (*Brachydanio rerio*) spawning on more than one occasion, yet the eggs released in a tank specially set up for spawning have failed to produce more than a few fry. Always I have removed the parent fish after spawning. The tank is equipped with a most efficient under-gravel filter so the water is crystal clear and the temperature is kept at 78°F (26°C). Your comments would be appreciated.

Try turning off the filter after the eggs have been laid. In all probability the eggs or tiny fry have been sucked into the filter bed and there come to grief. You have to think of everything when you are attempting to breed fish.

I have a piece of forked tree branch, minus its bark, which has been knocking about in my garden for a few years. Would this be safe to introduce into my aquarium?

I feel pretty certain your piece of wood would not do any harm if it is hard and not rotting away. All the same, give it a good soaking in hot water (to start with) and a good scrub. Then rinse it again in cold water. Anchor it to the bottom by tying it to a heavy pebble or piece of slate. I recommend nylon thread.

I should be grateful for some information on *Moenkhausia pittieri*.

This characin characterised by a large sickle-shaped dorsal fin (larger in the male) is native to Venezuela and reaches a length of about 2½ in. It is inoffensive, eats anything, and is not put out if the temperature falls very gradually to the low seventies (°F). The aquarist with some experience never finds it very difficult to breed.

I have just been given a tank frame measuring 39 in. by 15 in. by 12 in. What thickness of glass should I use for glazing?

Use glass a quarter-of-an-inch thick. A rough cast glass or wired glass will do for the bottom. Polished plate for the front.

Please give me the requirements, maximum size and country of origin of the catfish *Mystus vittatus*.

This fish asks for nothing special in the way of a home or temperature or food. In short, the ordinary tropical set-up and feeding procedure suits it well. It attains a length of about 8 in.—that is, after a couple of years on a diet of worms, meat and a good-quality dried food—and at this size can reduce a population of smallish guppies and other diminutive fish. It is found in many parts of India eastwards to Thailand and thereabouts.

I have bought two small *Corydoras aeneus* to tidy up the bottom of my tank. Do you think that at full size they will bully or eat other small fishes in my tank?

Let me hasten to say that catfish do not tidy up the bottom of a tank. All they do is to eat fresh food missed by the other fishes that do not grub about on the bottom. They will not clear the bottom of sediment or decaying food growing a fuzz of fungus. The way to get rid of such things is to siphon the bottom periodically, feed less generously or equip your aquarium with a good filter and still feed less generously. *Corydoras aeneus* mind their own business and will not take any notice of much smaller companions.

## GOLDWATER QUERIES

I keep my goldfish in a tank 15 × 10 × 7 in., and I cannot keep the water from going murky. I cannot grow plants as the tank is in a dark position. I give a pinch of dried food each day and a few *Tubifex*. Every time I clean the tank it goes dirty after a few days.

The water plants will not grow if they cannot get enough light. You should get a cover to the tank with

### by Arthur Boarder

a 40 watt lamp. This should be on for about ten hours a day. Stop giving the *Tubifex* as small goldfish do not always appear to be able to digest these worms properly and they are voided in such a condition that they can soon pollute the water.

How can you sex goldfish outside the breeding season?

This is not a simple task as some types of goldfish differ very little from each other as to sex when not in breeding condition. Usually an experienced aquarist can tell by the body shape of the fish, the female being fatter and usually shows a sharp curve up past the vent. Some male fish will carry the white raised tubercles on the gill plates all the year. The shorter bodied fancy goldfish are often more difficult to sex as they may have deep fat bodies quite pronounced at all times. A group of six fish should normally give both sexes.

**I wish to know why I cannot breed goldfish in my garden pond which is 12 feet x 10 feet x 18 in. deep? I have plenty of water plants.**

Providing you have both sexes and healthy fish, there is no reason at all why the fish should not give satisfaction. I take it that the water is in good condition as if not you cannot expect the fish to breed. It is getting late in the season now to expect goldfish to breed but you can try to obtain the conditions under which they should breed so that you can have better luck next season. Feed the fish well as long as they are taking food well into the autumn and even during the winter if there is a mild spell a little food can be offered. However, never give food unless the tiniest piece offered is taken immediately or you will foul the water. In the early spring give plenty of garden worms and at about the middle of April, change much of the water for fresh as well oxygenated water encourages the goldfish to spawn.

**My pond water is green with algae and I have been told that if the pond is deeper than the surface area you cannot get rid of the algae. Is this so, please?**

This is a new one to me. I do not see what the depth of the pond has to do with the problem and in any case it would be a peculiar pond which was deeper than its surface area. I think that the deeper the pond the less likely is it to be filled with green algae as this tiny plant thrives in good light and there is not likely to be much of this at a depth. A good balance of water plants will tend to keep the algae down. One of the finest plants for this purpose is *Lagarosiphon major*, which used to be known as *Elodea crista*. This plant is a rampant grower when it gets established and can throw out shoots over three feet long in a few months. The stems are covered with leaves which curl back and give the whole shoot the shape of a horn. Once the water is cleared of algae the plant can be carefully pruned, taking some of the stems away or shortening as many as necessary.

**We have a natural pond, 100 x 25 feet and an average of 4 feet deep, with two or three feet of mud at the bottom which the fish appear to be stirring up. We have added tench and a catfish;**

**are they the culprits? When we only had carp and rudd in the pond this did not happen. We dragged out a lot of Canadian pond weed. Could this have clouded the water?**

The pondweed, *Elodea canadensis* is a very fine plant for tending to keep the water clear but if left unpruned for a time it can take over too much of the pond. Tench are bottom feeders but I do not think that they alone would cloud up a pond the size of yours. Allow the pond weed to grow again and then when the water is clear some of it can be removed. You also state that there are now no newts in the pond, whereas there were plenty earlier on in the year. This is because they leave the water when they have finished breeding and should return next March.

**I have made a pond rather near a Laburnum tree and have now been informed that the leaves and seeds are poisonous. Can you please tell me how poisonous are leaves and seeds to fish; is the poison cumulative over the years; will a change of water each year help matters; if poisoned, what symptoms will the fish show and can you offer any more advice?**

All parts of a Laburnum tree are poisonous. If leaves and seeds remained to rot in a pond I suspect that the poison could increase in power. An annual cleaning of the pond water and any fallen leaves would save any trouble. If fish are upset by the poison they will go off their food, swim unnaturally, that is they will lose their balance, their fins will fold up and they will then lie on their sides on top of the water and die. If you remove as many leaves as you can each day when they are falling, there should be little trouble. A fine nylon mesh stretched over the pond during the late autumn will help.

**My pond is 9 x 6 feet and 18 inches deep. It was made about four years ago and during that time my Koi have grown from about three to five inches. Is this slow rate of growth due to the small size of the pond?**

Whatever the reason, your Koi should have grown very much larger than they have done if they had the correct treatment. The size of the pond can be one factor, and a very important one, as these fish like plenty of swimming space and if they get it they can grow at a very fast rate. In fact, I think that they can be considered as the fastest growing fish as kept by pondkeepers today, even out-pacing golden orfe. The size of the pond may not be the only reason for the slow rate of growth, the feeding problem can also have an important effect. You did not state how many fish you have in the pond and if they are the only species there. If too many fish are in the pond they will perhaps keep alive but are not likely to thrive.

(Continued on page 315)

# The JUNIOR SWORD PLANT

by Phillip J. Brown

*Echinodorus brevipedicellatus* (O. Kuntze) Buchenau comes from the Rio de Janeiro and Minas Gerais areas of South East Brazil. Under good conditions it will grow into a large plant and needs an aquarium of at least twenty gallons plus uncrowded conditions to attain its full beauty. The leaves, with stalks, can reach a length of over twenty inches (50 cms), the petioles making up about a half to equal length of this. In shape the leaves are lanceolate and pointed at both ends growing in a rosette from the stumpy rhizome. Aerial leaves are shorter and more rounded and have a tougher appearance than their submerged counterparts. The midrib is very prominent and arising from the base of the leaf two to-four (rarely six) pairs of veins run parallel to the midrib up to the tip of the leaf. At least two of these veins arise from the central vein in the lower half of the leaf. They are connected across the one-and-three-quarter inch width of the leaf by thin cross veins. In colour the leaves are a beautiful shade of light green. It very rarely produces emerse leaves if grown in a good-sized aquarium.

In the wild this is a perennial bog plant and will seldom flower in the aquarium unless grown under bog conditions. Above water the inflorescence can reach a height of up to forty inches (1 m) in length bearing four to six whorls of small white flowers, up to three-quarters of an inch across (2 cm). These flowers are held on their own short stalks. The flowers are bi-sexual with twelve stamens and many ovaries. The fruit is up to just under a quarter of an inch across (4 mm), and is bent and somewhat flattened with eight ridges.

It rarely flowers in the aquarium and if the inflorescence stays submerged, then adventitious plantlets will develop upon it in place of flowers. These should be left for a while and then the flower stem bent over and pinned down to the gravel. Once the new plants begin to grow roots and become attached to the substrate, the flower stem can be cut and the

plantlets allowed to develop into new plants. If they are separated too soon from the mother plant they may rot.

*Echinodorus brevipedicellatus* needs a lot of light to grow properly. It will thrive in strong artificial illumination but a position where it can gain some sunlight is to its advantage. Shady conditions do not suit this plant. If required to be grown in a small aquarium, reduced lighting and a low temperature will stunt its growth and help to keep it small. It enjoys an ideal temperature of between 68° and 77°F for optimum growth and the temperature in the tank should not be allowed to fall below 65°F. It will enjoy most growth in the summer and in the winter the temperature can be dropped a little to allow it to rest. Once established the plant will grow quickly under good conditions but it may take a year or two until the plant will reproduce itself. A pH value between 6.0 and 7.0 with a hardness between 5 and 12 DH. Soft water filtered through peat will be ideal for it.

For good growth this plant is a greedy feeder and requires a peat and loam base or alternatively unwashed sand. (Coarse sand compacts less easily than the fine variety and prevents roots rotting from lack of flow of air, etc.) In the community aquarium the substrate is best placed in short but wide flower-pots that can easily be hidden under the gravel or behind rocks and other foreground plants such as *Eleocharis* (Hair Grass).

To see it at its best and for it to attain maximum growth it should not be too crowded in a tank. A mature specimen is best used as a centrepiece for the aquarium. *Cabomba* or *Myriophyllum* placed a little way back from it will make a fine backdrop. It is a beautiful and popular Amazon Sword plant more suited to the large aquarium than the small, however. It was formerly known as *Sagittaria brevipedicellata*, O. Kuntze.

# AN IGUANA AND HIS VITAMINS

by Peggy Aldis

IT WAS MY intention originally to subject my fellow readers to only one article on my Iguanas, but circumstances have since prompted me to write again on the subject. I feel a recent experience might prove helpful to others.

It all started with my smallest Iguanas' (8 in. long) decision to stop eating. I did everything I could think of to tempt him; first the daytime temperature was raised from 25°C to 35°C which made no difference at all. So a larger home was provided, with branches to climb, plenty of places to hide, water to swim in, and an infra red lamp to bask under.

Still not interested in food. It was suggested that perhaps company might help. My large Iguana was housed separately, and I knew that he would not tolerate intrusion. So another small Iguana joined the family, and instant friendship raised my hopes considerably. But alas, it still did nothing to induce my patient to eat. Becoming thinner and weaker, scarcely able to lift his back legs, he was now looking very frail. As a last resort I turned to force feeding which, needless to say, was disliked.

One day a month or two later, whilst on my lap my little Iguana had a kind of fit, first shaking violently, then the whole body stiffening for several minutes. This was the last straw. I cannot explain to you how I felt at that very moment. Without a shadow of a doubt my lack of knowledge only was responsible for his sad condition.

Professional help was urgently needed. Fortunately in my area we have an extremely clever Veterinary Surgeon who, I am given to understand, is very knowledgeable in the care of small animals including reptiles. So the next evening found me in his surgery with the little Iguana comfortably wrapped up in my shopping bag.

When the Vet lifted him out and said, "Oh! a little green Iguana. What a dear little chap," all the words I had carefully rehearsed now vanished and with tears trickling down my face, all I could say was, "He

will not eat, please don't tell me he must be put to sleep." The Vet smiled, and after giving my Iguana an examination proceeded to explain why the trouble had started. It was due to extreme vitamin deficiency; although vitamins as such had been given they were not sufficient and of the right kind. He concluded that with patience little Iguana had a good chance of recovery. A special bottle of pre-digested liquid food was to be given as often as possible with an eye-dropper. Also concentrated Vitamin tablets, namely (SA-37), a sprinkling of one to be mixed with a portion of minced raw meat, forcibly fed if necessary once a day. Regarding the method of feeding: I was assured that this was in no way cruel providing it was done gently and with care.

I am glad to say that in no time at all my green Iguana was enjoying his hourly drop of liquid food and much to my surprise eventually opened his mouth and let me pour it in.

The solid food on the other hand was a different matter. Everyday was a battle, most of the food ending up on the floor or on my lap. Nevertheless the difference in him after two weeks was remarkable, he looked fatter, more lively, and no longer slept all day.

I decided, nevertheless, to continue force-feeding until one day whilst mixing up the vitamin powder, etc., my Iguana suddenly burried his head in the dish and quite voluntarily ate every bit; even my cry of delight did not deter him. After this I am pleased to say there has been no looking back, everything that is now offered is eaten with zest and he is growing at an alarming rate, can run at lightening speed, and colour has returned to a beautiful emerald green. It is hard to believe now how close to death he came.

I feel somehow that not enough advice is given when one buys these creatures. The pet shop proprietors' knowledge is unfortunately often very limited. It is indeed very sad that many Iguanas must die needlessly.

# From a Naturalist's Notebook

by Eric Hardy

EXCEPTING escaped pets, snakes are as absent from South Lancashire as from Ireland. Hence our surprise when a cat caught a female adder, unusually long at 18 in., in a field on the Barrows Green side of Widnes last September. Though Widnes changed to Cheshire in the new county boundaries, it is ecologically old South Lancashire.

Not since my youth over 50 years ago were the last lingering adders found on Chat Moss, Simonswood Moss and Carrington Moss, the old peat-cutting heathlands. The possibility of any still breeding in some oasis in this industrial incubus is fascinating. A sliver of cast snake-skin on Simonswood Moss in 1969 could also have been an escaped pet. Apropos my recent remarks on the alleged decline of grass snakes in the West Midlands, 16 were seen in July by the Shropshire Union canal near Berriew.

Incidentally I cannot recollect hybridisation among wild reptiles, though it occurs among some fish like roach and bream. It is unusual in reptiles even in captivity. A German herpetologist recently listed 83 known crossbreds among 65 species, over half being lizards, less than a quarter in snakes nine turtles and three crocodiles.

From the San Diego Society of Natural History comes James W. Wiley's interesting 22-page illustrated *Life History of the Western North American Goby, Coryphopterus nicholsii*. Californian seashore pools are rich in these little fish, while Florida has beauties like the neon goby (*Elaeagnus oceanops*). Several are kept in aquaria. A few inhabit our own shores.

This rock-dweller feeds mostly on tiny crustaceans, turning more to worms and eggs in winter. It is distributed in its more active juvenile stage, and in captivity its territory-defending habits establish a hierarchy among the occupants of the aquarium. Its territory consists of a shelter and a feeding-display area in front of it. As two shelters may be only 25 cm. apart, encounters with neighbours are numerous. In the aquarium, any shelter available, including tank-corners, is utilised and fought over. It can change colour and pattern according to habitat, and swims in short, quick spurts for feeding, territory-defence or escape to shelter. A sandy bottom is preferred.

Most gobies behave like this, seeking a rocky crevice, a shell or some hard attachment for their adhesive eggs. The male fans the eggs with water-currents until they hatch, similar to fanning which is accompanied by rubbing and digging movements in pre-

paring the nest. Fanning like this while vigorously waving the body is one of the most widespread nesting habits in fishes.

From the U.S. Bureau of Sport Fisheries & Wildlife comes Wells and House's far less inspiring 12-page *Life History of the Spottail Shiner (Notropis hudsonius)* a bottom-fish of the Great Lakes. It contains no observations on behaviour, no tank-studies, merely distribution, age-composition, sex-ratio, length-weight growth-ratio and reproduction times, gleaned by collecting specimens and dumping them into laboratory formalin. Any lab. technician could have conducted this without needing a Ph.D., and at half the salary.

Apparently only five out of 20 former breeding sites of rainbow trout (American steelheads) which are spotted on the tail-fin survive in Britain according to a recent survey by Freshwater Biological Association biologists. Many waters are stocked with them, but survival in most cases depends upon restocking. It is interesting that only two of the current five breeding waters were on the original list over 30 years ago. This is a spring-spawner, in fast gravelly rivers. Its migratory habits make it difficult to establish, and it dislikes the static water of lake or pond where it usually becomes eggbound and dies. There seem to be two strains, spawning around Christmas and March-April. Norwegian breeders adapted them to salt water, and hybrids have been produced with Atlantic salmon milt, as well as with cut-throat and brown trout (both sexes with the latter). The term rainbow trout is used in America for a different species, *shasta*. American brook-trout breed in Wise Ean Tarn on Windermere's Claife Heights, but inbreeding keeps them small.

There is no ground for fearing the rainbow-steelhead will oust our indigenous brown trout, in the way that Asiatic catfish escaped from hatchery ponds to spread through Florida, Georgia and Alabama, a threat to native fish. These catfish are said to have "walked" into nearby streams and lakes by using fins and tail. This is the channel or blue catfish *Ictalurus furcatus*, not to be confused with their native stonecat, *Noturus flavus* of Lake Huron, etc., or the big Mississippi catfish, *Ameiurus lacustris*. Different again is the European wels, sometimes called catfish in Britain.

Nothing on fishes or blind cave-dwellers but chapters on fascinating night-dwelling amphibians and nocturnal reptiles add interest to *Animals of the Dark* (David & Charles, £3.50) a new, illustrated 200-page book by Clive Roots, Director of Winnipeg's Assiniboine Park Zoo. This is a factual book of biological

interest, from which one learns that rattlesnake venom is still toxic when 50 years old, and that axolotls and other "Peter Pans" don't grow up because of a lack of iodine in their living water. Leopard-frog tadpoles withstand 106°F in Yellowstone Park springs.

The Swedish race of the common frog lives inside the arctic circle, while 15,000 people a year are reported to die from the common krait snake in India. Despite its American background, the book covers much of the world with its examples. It does not go deeply into things, obviously without room to mention much more in amphibian biology such as the role of *protozoa* in the nutrition of toad-tadpoles, which has been worked out in South Africa by Nathan and James at Witwatersrand University, or the nocturnal navigation of frogs back to traditional breeding ponds.

Aquarists know the blue-green *algae* best for clouding up the water and contaminating it with a foul algal bloom. Unfortunately, tanks and ponds can hardly apply explosives which collapse its gas-vacuoles, thereby killing the *algae* on larger waters. Cyanophages are also used to get rid of it.

Trying to help a foreigner write a book on the history of early wildlife photography, I find it difficult to trace who took the first living fish photographs, or aquatic life. Martin Duncan, the pre-war librarian at London Zoo, and H. C. Chadwick, curator of Sir Wm. Herdman's marine aquarium at Port Erin at the turn of the century, were pioneers, but probably not the first.

I should be grateful to know of the first pictures taken in days of wet plate photography. Flying wild birds photos were already being taken in Lancashire in 1888, well before the oft-quoted Keartons, and wild mammals in Staffordshire in 1891. Difficulties of reproducing the early photos in books or magazines make it misleading to seek the pioneers in early publications. More likely their prints are stored away in laboratories and old collections, and their glass plates lost.

In 1882 Harry Barker described his photo-micrography of aquatic life to the Postal Microscopical Society, but their journal could only illustrate his account with a line block. In 1883 William Pumphrey read a paper to Bath Microscopical Society on his similar methods, while the Royal Microscopical Society was already using Stein's photo-micrographic apparatus. In 1884, M. Trutat's book *La Photographie Appliquée à l'Histoire Naturelle* was published by Gauthier-Villiers in Paris, but its 223 pages had the reproductions engraved, like red marine *algae*, and coloured. It covered a wide range of botany and zoology. There was already a *Photographic News* producing a year book and almanack, when photography was still a laboratory operation. In 1882, M. H. Stiles read a paper to Doncaster Microscopical Society on the same subject; W. Shipperbottom was inventing shutter-improvements for microscopists in the Midlands, while a photo-engraved plate of *Pinnularia nobilis* illustrated M. G. Huberson's 100-page *Precis de Microphotographie*, published that year.

---

## FISH-BREEDING IN COMMERCIAL QUANTITIES *(continued from page 307)*

methods of obtaining the foods used must be made as simple as possible. That old favourite *Infusoria* can be forgotten from the start as its production takes up far too much space. Hardboiled egg yolk or "Liquify" can be used instead for fishes small enough to need them. Of the second stage foods both Microworms and Microeels are easily cultured, but the eels are probably more applicable to quantity production as the culture life is longer and they can be handled more easily. For the next stage, and the first stage with the larger species, Brine Shrimp is the king. There is not really a comparable alternative and so every breeder must develop a good hatching method. Following on, we come to Grindal and Whiteworm, which are easy enough to produce, but absorb space with their large permanent culture boxes. All of the above foods should be considered to be the primary requisites for good growth and health. *Daphnia* is also beneficial if it can be obtained in sufficient quantity cheaply and is clean. Other foods such as peas, cod roe, liver and dried powder and flake foods can be interspersed with the main foods to give variety and balance. Feedings

may need to be as often as six times a day with some foods while others, mainly some of the live foods, can be put in in sufficient quantities to feed the fry for half a day at least because they may live for some time in the water and will not become lost if the aquarium has a bare base and section. It will be found that all of the above cultured foods require a higher temperature for their maximum breeding rate than normally occurs for long periods in the English climate, so this facility must be provided artificially else production will not be consistent. Heated cupboards or containers will be needed for Microworms, Microeels and Brine Shrimp to give a temperature of about 75°F, while Whiteworm require about 60°F, which may turn out to be the average ambient temperature in the fish-house itself. All of these cultures have, of course, to be fed, cleaned and generally maintained in themselves and so yet another routine must be rigidly observed.

In conclusion then, we can see that the aquarist who decides to devote his efforts towards quantity production will be taking on some fairly demanding

responsibilities. Having made the initial cash investment in the building and its equipment and services, there is naturally a financial incentive present to keep these factors in the foreground. The problems mentioned are not insurmountable but only require the application of patience and, of course, the basic aquatic skills. The satisfaction of being able to produce regular batches of good healthy fishes is very rewarding apart from the financial results. Of the many figures given in the foregoing text, several are open to argument and variation and so every effort has been made to give either minimum or average recommendations. The stocking figure of twenty-five fishes per square foot may be low when certain species are kept by a very skilled aquarist, or, on the other hand, the idea of a fish reaching saleable size at ten weeks old may be too demanding for those who do not devote themselves sufficiently to the subject, so that they may need to use say twelve weeks as a better figure. In the final analysis each aquarist must make his own calculations as shown above and endeavour to arrive at an optimum system which suits his personal abilities and facilities. A summary of the various calculations is given to allow the substitution of other quantities in the examples shown.

#### SUMMARY OF CALCULATIONS

- 1. Production rate:**  
Income required (say) £50 per week.  
Selling price per fish (say) 10p.  
Thus quantity required = 500 per week.
- 2. Total surface area:**  
Age at saleable size (say) 10 weeks.  
Thus total population = 5,000 fishes.  
Stocking density (say) 25 per sq. ft.  
Thus area required = 200 sq. ft.
- 3. Number of aquaria**  
Aquarium size (say) 4 ft. × 1 ft. × 1.5 ft.  
Thus surface area = 6 sq. ft.  
Thus aquaria required = 34.
- 4. Further information:**  
Population of each aquarium = 150 fishes.  
Total volume of water = 1,275 galls.  
Total weight of water = 5.7 tons.
- 5. Capacity of fish-house:**  
Total volume of aquaria = 204 cu. ft.  
Water: Air volume ratio (say) 1:3 (= 25%).  
Thus volume of building = 850 cu. ft.  
Height floor to ceiling (say) 6 ft.  
Thus floor area = 142 sq. ft.

## COLDWATER FISHKEEPING QUERIES *(continued from page 310)*

**We have recently lost some goldfish from the pond. They have shown a form of damage to their bodies which is later covered with fungus. We have found a lot of larvae in the pond and wonder if they are the cause? I have enclosed a specimen.**

The specimen was very dehydrated when it arrived, but I was able to identify it as the larvae of the great dragonfly. These creatures are voracious feeders on fish, and even if they do not kill a fish they seize, they can inflict a wound which can become fungused and cause the death of a fish. Try to catch as many of these pests as you can. One of the best times to do so is at night. They have to come to the surface to breathe and if you go quietly to the pond at night with a strong torch and net, you will find them at the surface when they are easy to catch.

**I have made a garden pond and am very disappointed to find that there are only one or two species of water snail available at pet shops to put in my pond. Why is this?**

Do not bother about the snails, as they can be more nuisance than they are worth in a garden pond. The types you are likely to find readily available are: the Fresh Water Whelk, *Limnaea stagnalis*; the Ramshorn Snail, *Planorbis species* and the Fresh Water Winkle, *Vivipara vivipara* or *Paludina vivipara*. Water Snails can eat or damage water plants, they

eat fish food and fish eggs and their droppings can pollute the water if they are in numbers. Their only value as a food for the fish is when they are first hatched from the egg and are then small, poor food. Water Snails never yet kept pond water clear.

**I have just installed a pond in the garden and wish to make a rockery with waterfall. I have been offered many types of rockery stone for the purpose but would like your opinion on the most suitable?**

If you can get some weathered Westmorland rock, this will be ideal. Always scrub rocks to be used before you set them in position. As to your fear that any cement you use to make the fall will harm the fish, you can avoid any possible trouble by making the trough first and then lining it with a plastic liner. Then adjust the rocks so that the edges of the liner are hidden and the water will flow down into the pond without leaking at any join in the rockwork and be free from lime.

**I intend to construct a garden pond using a liner and would like some advice on construction, types of fish and flora.**

Get my book "Coldwater Fishkeeping," and all your questions will be answered in it. Get it from *The Aquarist* as shown in advertisements.



# VIEWPOINT

by A. Jenno

FOR SOME TIME NOW, one of my "hobby-horses" during conversations with other aquarists has been a criticism of the type of activities carried out by typical aquarium societies of my experience. It seems that the object of these societies is nowadays almost entirely concentrated on showing fishes, either at private table shows or in the organisation of, or attendance at, the larger open shows, and that this kind of exercise is even becoming the main reason for the existence of many of the clubs. The idea that one man should be seen to better another by the possession of a superior specimen of livestock is, of course, an old tradition, particularly in the fur and feather fancies, but why we should carry this on so strongly now in our aquatic circles is beyond me. Some years ago when I was the secretary of a small Midland club, it was the usual practice to have a good lecturer at each meeting, table shows three or four times a year, and a members-only all classes show (laid out as a public exhibition) once a year. That club was typical in its programme at the time and our emphasis was always on information and education, with the showing aspect included only as a secondary function and this with the genuine object of allowing people to see each other's fishes occasionally and to encourage friendship and conversation amongst members. Nowadays I fear the picture may be changing, and not for the better. From the point of view of the young aquarist or the adult beginner, who joins a club initially to further his knowledge and interest in fishkeeping and, by no means least, to meet others with similar ideas, it must seem apparent straightaway that to become a "proper" member he must show his fishes. Every meeting nowadays seems to contain a table show, and any visiting lecturer is often virtually only a fill-in to occupy the time while the fishes are being judged. Such items of agenda as "Aquatic questions," "Sales and wants," etc., are got rid of quickly and at the end of the meeting the climax comes when a long detailed analysis is expected from the judge, who must comment on every little fault and failing of the fishes, and must generally give the whole proceeding that atmosphere of deep mystery which makes the beginner feel that he is a very ignorant person indeed. Thus the novice gets the impression that the beginning and end of all fishkeeping is approval of his stock by his betters on the show bench. Many of the lectures given nowadays are also show-orientated, particularly the slide shows, so that a person can come away from a meeting having learned nothing other than that his favourite fish is

theoretically not fit to live in decent company. The system breaks down, of course, eventually when the show-mad aquarist suddenly realises one day that he is wasting his time and money in galivanting around the countryside to all the shows just to compete against the same people again and again. This aquarist is then often lost to the club world because there is nothing in their regular agenda to interest him anymore, and many people then drift out of the hobby altogether. In my opinion we must provide a better service in the clubs for the youngsters particularly, and beginners in general. Anyone who becomes a pot-hunting showman is a failure due to some club somewhere, and certainly our present generation of young aquarists should not be encouraged along this path. Aquarists must be given access to lectures, discussions, slide shows, etc., which feature fishkeeping rather than fish-showing, so that our techniques and methods will develop and we can all become truly expert aquarists. The pot-hunters might also reflect that any high-pointed specimen they may see on the bench has almost certainly a better counterpart elsewhere, whose owner has far too much respect and affection for it to subject it to the trials of the show bench just so that people may know who it belongs to. Our clubs then seem to need better organisation along different lines, and the larger controlling bodies or associations should lead the way by bringing forward educational programmes for youngsters and by initiating projects of true aquatic value. At present it would seem that the only real object of some associations is to co-ordinate show standards and judging methods and to foster the idea of intense competition in what should really be one of the most non-competitive and relaxing of all hobbies. We are in danger of becoming like our angling compatriots to many of whom fishing without a competitive match is not fishing at all.

During my annual holiday in Weymouth this year I was able to visit two places of considerable aquatic interest in the area. First and by far the most interesting to me, personally, was Bennett's Water Lily and Fish Farm at Chickereil, near Weymouth. Here Mr. N. H. Bennett and his son Leslie run a well-established aquatic farm in the true sense of the word. Water lilies and other plants are grown in natural conditions in large quantities and many of the fishes are also home-produced. The farm has been developed by Mr. Bennett from what appear to be old brickworks' quarries or pits, and these facilities extended by the digging of other new pools as required. The property

covers some few acres and because of its natural origins is an extremely pleasant place to walk around. Most of the pools are devoted to growing the various water lilies in batches according to age and so most varieties can be seen somewhere in flower, which is a great asset to those buying a new specimen. Being pretty well a newcomer myself to garden pool aquatics, I was extremely surprised by the available colour range present and the choice of sizes to suit any pool. The largest variety which I saw, a yellow called Sunrise, would seem more suited to a lake than a pool, while the miniatures were being cultivated in washing-up bowls without overcrowding. There was also a hothouse containing the exotic blue tropical lily *Nymphaea colorata*, which should interest those with indoor or fishhouse pools (an article on tropical lilies appeared in *Popular Gardening*, 10th August, written by Leslie Bennett). The star attraction of the whole place for me, however, was a shoal of fully-grown, supremely healthy Golden Orfe living in one of the large lakes. They were fed during my visit on pool pellets, which, of course, brought them all to the top, and to see so many of these large beautiful fishes appearing from the depths at once to feed was a sight I shall long remember. Incidentally, most of these Orfe had small, black flecks on their sides and backs and although this is not always approved of by serious coldwater aquarists, who generally favour the all-gold colouring, I thought the flecks were a definite improvement when seen on these deep-bodied mature fishes. The Orfe spawn regularly in the lake and so provide an ample supply of eggs from which Mr. Bennett is able to raise his own stock for disposal. Mr. Bennett himself is obviously an expert and dedicated aquarist who is deeply interested in his subject. His major concern at the time of my visit appeared to be the condition of the various imported goldfishes and shubunkins he has received recently. Apparently the troubles which these fishes suffer from are not always easily definable as particular diseases, so that treatment is difficult and quarantine periods often very lengthy, sometimes even from one season into the next. I was shown fishes under quarantine in this state, and I was hard put to see much wrong except that the fishes were rather lifeless and tended to be just lying still below the surface, but Mr. Bennett assured me that he considered them to be definitely sick, and as such, of course, unsaleable, and that only time and the good living conditions provided would improve them. Another comment, this time on the use of floating pool pellets, was most interesting. It seems that the pellets swell to at least twice their original volume after wetting, so Mr. Bennett feels that it is not good for small fishes to take the small sizes whole immediately on feeding (i.e., when dry), but should instead be fed the larger size so that they must nibble off pieces or wait until the pellets become soft after a few minutes of

floating in the pond. He is at the moment trying to encourage the manufacturers to produce a larger "biscuit" form, so that the same treatment can be accorded to larger fishes. He also said that before the introduction of the pellets he had used bread as a basic food and now found the "new" diet to be a very significant improvement. Certainly the fishes on view bore testimony to this. Mr. Bennett kindly gave me some duplicated "hand-outs" of useful information with permission to publish, so I shall endeavour to include these in a later column during the next cold-water season.

The other great attraction for me in Dorset was Compton Acres, near Poole. This is a group of separate, distinctly different gardens installed around a large house, but in such a way that each area is complete in itself and other areas cannot be seen from it. Unlike many other public gardens, the use of pools and waterfalls has been encouraged here, and in fact the more spectacular areas are actually water gardens with the aquatic features being the prime objects on display. The types of gardens on show are identified by association with some descriptive name, so that we found the Italian Garden to contain a very large, basically rectangular pool in the formal style, complete with beautiful fountains and statues and carefully arranged patterns of various water lily plants. The water was crystal clear and kept so presumably by the abundant oxygenating plant growth which covered the whole base of the pool, and the inhabitants were some hundreds of small goldfishes which would follow visitors around the sides in large shoals. Being more inclined towards the natural type of pool myself, I must say I was pleasantly surprised by the effect of the extremely formal setting, and can now see why this style has its adherents. It must, of course, be carried out properly and thoroughly, and is obviously more impressive on a large scale, but for sheer spectacle this pool must rate as the best that I, at least, have ever seen. Another area, called simply the Rock and Water Garden, had been very carefully arranged on a slight slope and used a whole series of interlinked waterfalls, cascades, and both small and medium-sized pools. A cunning arrangement of paths and bridges takes the visitor around the whole thing without any omissions. The stars of the show in these waters were the fishes. Several very large Common Carp were rolling and generally playing about in the largest pool, and in a smaller side pool there were five beautiful Chub, far bigger, I am sure, than many a fisherman has ever seen. These lay motionless near the surface and seemed quite unafraid of the visitors. Both the Chub and the Carp appeared blue on their backs rather than black or brown as might be expected and were easily visible in the clear water. I have no time at all for small wild fishes, but these large specimens would grace any sizeable pool. The sheer size and obvious

power of such splendid fishes was more than enough to warrant their inclusion where other, more colourful, fishes might have been chosen instead. The last plot in the series is the Japanese Garden, and is indeed truly so because it was built by Japanese craftsmen who brought all of the materials and plants from Japan for the purpose. The main inclusion is a large natural style pool complete with an authentic waterside tea-house and various stepping-stone paths which allow a very full view of the pool and its contents. The population consisted of hundreds of Golden Orfe of all sizes, and a few Koi. The Orfe were constantly on the move, again in perfectly clear water, and presented a magnificent, ever-changing picture of grace and rapid movement which was really impressive. The pool is surrounded by Japanese plants, statues and other artefacts, and the impression of being in a foreign land

was remarkably complete. My only disappointment was that in these days we might expect a better representation of Koi than was present. In all, the gardens can be thoroughly recommended and it should be pointed out that there are alternative level paths for all otherwise difficult places such as at bridges and stepping-stones, and invalid chairs are available, so no-one need be discouraged from going around. To complete the aquatic side of my holiday, I would have liked to visit a really good public aquarium, but there does not seem to be anything in the area, which is surprising considering the potential custom. The small Weymouth Aquarium turned out to be just a display of the well-known large tropical freshwater fishes, well-kept and clear certainly, but, nevertheless, disappointing at such a popular seaside town.

---

## PRODUCT REVIEW

### **Uno Hi-Load Slik-Stat External Thermostat With Earth, price £2.64 plus VAT.**

When I reviewed this thermostat in the July issue I was unaware of its price. The manufacturers have since informed me that this external thermostat retails at £2.64 plus VAT. A combined heater/thermostat unit, complete with earth and safety fused, is also available from Uno Products. It is known as the Uno Automatic Heater with Earth—Safety Fused, and retails at £2.58 plus VAT.

The Uno Hi-Load Slik-Stat External Thermostat With Earth can in fact be used with an ordinary Uno Regal heater if the earth lead of the thermostat is taped back; however this does defeat the safety object of the outfit. One wonders: "Is the public willing to pay for safety?" I think the public would be willing to pay for safety if it were convinced that "safety" products were safer than ordinary electrical products for use with or in aquaria.

When I reviewed the Slik-Stat in the July issue I ended by saying that I had been unable to test the thermostat in operation because I did not have a Uno 'E' type heater. This omission has now been rectified. I was supplied with an appropriate heater, my review of which appeared in the October issue.

### **Everglades Aquatic Nurseries' Plant Catalogue, price 20p, from Everglades Aquatic Nurseries, Baunton, Nr. Cirencester, Glos.**

As quite a number of the letters I receive concern readers' successes or failures with aquarium plants, I

was most interested to receive the latest edition of the above catalogue. The proprietor of Everglades, Mr. Barry R. James, is well known in aquatic circles. The catalogue, although supplied free to the trade, can be obtained for 20p by retail customers—and as the catalogue is professionally printed, the 20p charge is only a proportion of the total cost of production. The catalogue is probably the best and most comprehensive I have yet seen produced in the U.K. It has a glossy cover and stretches to 32 pages. Aquatic plants are grouped under eleven headings: *Tropical* (1) bunch plants; (2) specimen plants; (3) dwarf plants (foreground); (4) floating plants; (5) miscellaneous aquatics; (plus tropical plant collections and sundries); *Coldwater aquatic plants* (6) bunch plants (oxygenators); (7) marginal plants; (8) deep marginal plants; (9) water lilies; (10) floating plants; (11) waterside plants. Over 150 species of tropical plants are listed, as are 94 plus species suitable for in or around cold-water environments—some for pools and some for aquaria. There are brief descriptions and/or details about each plant, and the catalogue contains many simple but very useful drawings of different species; these are very helpful for identification purposes for those who don't know much about various plants.

All the common plants are listed in this catalogue, together with many less common and rare plants. If you are interested in aquatic plants, and wish to obtain some of the species your dealer may not usually have in stock, I suggest that you invest in the Everglades Aquatic Nurseries plant catalogue. You're

bound to find something in it to interest you—probably that elusive plant for which you have been looking unsuccessfully.

*Correction:* I would like to point out that in my review of Tropicure Vitex tablets (August issue, page 182), a printing error, for which I was not responsible, appeared. The word "chlorine," as printed, should have read "choline."

B. WHITESIDE, B.A.

**TetraRuby, Colourpride Flake Food**, manufactured by Tetra Werke in Western Germany. Available from all good tropical fish shops. Retail price Double tin size ( $\frac{1}{2}$  ounce) £0.59, Breeders tin size (2 ounces) £1.20.

It is generally recognised that tropical fish in our aquaria have to cope with some very adverse conditions even though most hobbyists do their best to provide them with their basic needs. It is, in fact, quite amazing, what aquarium-kept fish will tolerate when one compares these conditions with their natural environment. Luckily, most species are able to adjust their way of living so that they can tolerate these alien environments—and the enthusiasts can even keep together fish with fundamentally different needs. It is not surprising, then, to find that they will react in some way to these enforced conditions and two of the usually accepted differences between a "wild" species and an aquarium-kept fish is their marked difference in size and coloration. The size problem—if it could be called such—could easily be overcome by providing the fish with a volume of water and swimming space to enable them to grow to maturity without being stunted. The lessening of the intensity of their coloration is generally regarded as being the result of a grossly inadequate diet as well as continuous in-breeding, and no substitute food or tonic or anything else has been found to bring back the sometimes gorgeous colours of most tropical fish.

In nature, fish live on micro-organisms, algae and other vegetable matter, on worms and various insect larvae and crustacea, and any serious tropical fish publication will point out the necessity of a varied and balanced diet. But as most hobbyists know that their fish will live quite happily on a single food, they feed their fish either on *tubifex*, *daphnia* or dried foods. Modern dried flake foods are, of course, as near a perfect substitute food as is possible; they include, apart from the protein, fat and fibre, the vitamins and trace elements so essential for the health and well-being of fish. But although many species of tropical fish can be maintained with a quality flake food, it is still advisable to give them a regular feeding of some live foods.

Over a long period of time, as part of their continuous research for the improvement of their TetraMin

range, Tetra Werke have tested many hundreds of natural ingredients and, as a result have developed a new kind of food called TetraRuby. It is not enriched with hormones which could have detrimental effects if they were given over a long period of time, but TetraRuby is entirely based on natural ingredients which are capable of intensifying the colours in tropical fish. In their own modern laboratories they have developed a way to stabilise the colour-inducing ingredients and according to information I have received from Tetra Werke, this new kind of flake food is the first natural diet formulation for tropical fish to bring out and intensify the natural colour pigments; it is scientifically formulated with a superior combination of vitamins, all the essential amino acids as well as special trace elements. TetraRuby contains fish meal, shrimp meal, oat flour, herrings roe and milt, fishliver meal, algae and kelp, wheatgerm oil, carotene, canthaxanthene and astaxanthene out of lobstershell extracts and salmonskin extracts.

To bring out the full colours in tropical fish Tetra suggest that fish are fed on TetraRuby for a period of 2 to 3 weeks and at least 2 to 3 times a day. (It should be remembered that one should give only so much food as can be eaten by the fish within a few minutes). This new kind of flake food will, like other Tetra flake foods, swim on the surface of the water for a little while before it will start to sink to the bottom and it will also not cloud the water. All Tetra's flake foods are a measured combination of various coloured flakes and in TetraRuby the greater part seems to be a new and orange coloured flake.

Some species, according to Tetra Werke, will show a marked improvement in their overall coloration within a few days but most species will display their full brilliance after having been fed on TetraRuby for 2 to 3 weeks. At this point the TetraRuby can be discontinued, although an occasional feed will keep the fish in good colour.

I have only fed my Golden Gouramis with this new food and I must admit that their overall coloration seems much more brilliant now than before. I have also tried to give these flakes to my Blue Discus fish to see whether I could improve their colours, but, unfortunately, the flakes were completely ignored by the fish. As my young Discus fish are all willing to feed on flake food in tablet form I hope that Tetra Werke will produce TetraRuby also as a tablet food in the near future.

Although TetraRuby is considerably more expensive than other flake foods I am sure hobbyists will be quite willing to pay the extra costs and as a result will see their fish display their full range of natural colours, since after all, what is our hobby but a gorgeous display of living colours?

Eberhard Schulze.

## BREEDING SCHUBERT'S BARB

by Nicholas Osborn (aged 14 years)

*Barbus schuberti*, the Gold or Schubert's Barb, is not a fish that can be found in the wild; that is to say it is not one of Nature's marvels, but a golden mutation of a species of small tropical fish. However, its origin is not clear. We know that the man who developed this fish was an American aquarist, Mr. Thomas Schubert of New Jersey, U.S.A.—hence the name *Barbus schuberti*, but it is not known from which species of fish it was derived; some say it is a golden variety of *Barbus semifasciatus*, others that it is a strain of *Barbus sachsii*. There is certainly much evidence to show that the Gold Barb is a form of *B. semifasciatus*: both species are identical in everything but colour: the Gold Barb has a rich, deep golden colour, whereas *B. semifasciatus* has a greenish-gold colour, both have the same body shapes, the male being smaller than the female, and the markings of both species are similar—that is, the male having a broken black line running along the lateral line, the female having scattered black dots above the lateral line, and both having the black spot at the caudal peduncle.

The requirements of the Gold Barb as a fish for the aquarium are not great; in fact it must be one of the easiest tropical fish to keep. It can withstand temperatures from 68°-82°F (20°-28°C), thrives in almost any kind of water (within reason), and, being omnivorous, is easy to feed, accepting all fish foods.

The Gold Barb is also quite easy to breed. The set up is much the same as for any Barb—that is, a fairly large tank—24 in., or more, is ideal, filled with soft, slightly acidic water (preferably  $\frac{1}{2}$  rain-water,  $\frac{1}{2}$  tap-water) up to a height of 7 in. (This is not essential and results can be obtained using harder, more alkaline water). Into the tank are placed a few bunches of the spawning media (be it strands of nylon wool, coconut fibre, real or artificial fine-leaved plants), weighted down with strips of lead or small stones. It is important to have this spawning media as it offers some protection for the female from the eager male when spawning is over, and also catches the eggs. The eggs can be protected from their

parents (who, unfortunately, are avid egg-eaters), by placing a layer of small stones or marbles on the floor of the tank; the eggs fall between these and are hidden from the adult fish. The temperature of the breeding tank should be about 80°F (27°C), and aeration is beneficial.

The pair of fish is then introduced into the breeding tank, both fish having been well-conditioned on live food for a few weeks, and, if possible, separated. The female fish should be very heavy-bellied with roe and the male fish should have a red underside and be almost ceaselessly active, showing his readiness to mate.

Spawning will almost invariably occur within 1-3 days and is quite fascinating to watch: the male nudges and chases the female inducing her to spawn and eventually she gives in to him; he drives her into the spawning media, both fish quiver side by side and a few eggs are released by the female. The male immediately fertilises them and the ritual is performed again. This goes on for a few hours, (with a few resting periods), and then the female ceases to respond to the male's provocation. Both fish should now be removed from the tank otherwise they will quickly devour their own eggs. The eggs are spherical in shape, 1-1½ mm. in diameter, almost transparent and have a small white spot at one end. They hatch in 36-48 hours and the minute fry (about 2 mm. long) can just be seen hanging on to the sides of the aquarium or the spawning media.

After hanging on the glass or spawning media for one or two days the fry, having used up their yolk sacs, can be seen swimming around the tank looking for food. They are now about 3 mm. long and should be fed three or four times a day on infusoria. This can be prepared by adding a piece of bruised lettuce leaf to a jar of warm water about 75°F (24°C); after about 48 hours the infusoria will have formed and can be fed to the fry. Alternatively one can use the commercially available product "Liquify, No. 1 (red) tube, for egg-layers."

After about a week of feeding on infusoria, or whenever they are large enough, the fry can be fed

twice a day on Brine shrimps, Micro-worms and powder-fine dry foods. After a further week the fry are about 6 mm. long and strong enough to withstand a change of environment, so, if possible, some should be transferred to different tanks, containing water identical in every way to that of the breeding tank. If no other tanks are available the breeding

tank should be filled to within one inch of the top, thus giving more swimming space for the ever-growing fry.

Soon the fry are large enough to take small daphnia, chopped tubifex worms and ground dry foods; now is the time to sit back and relax, to watch and enjoy the shoals of fish you have successfully managed to raise.

## AMERICAN FLAGFISH

by Ann Walker

This pretty little fish comes from the lakes and swamps of Florida and Yucatan. It has been kept in Europe since about 1914. Its popular name—American Flagfish—is derived from the fact that it bears a resemblance to the stars and stripes of the 'American Flag.'

The male grows to nearly three inches in length, although the female only attains two and a half inches. The body is relatively deep and compressed and is covered with olive and green-brown scales flecked with green spots. When the fish is viewed in good lighting conditions, the scales seem to shine, reflecting green and blue light. The scales are edged with red to give the 'stars' of the American Flag. The fins are flecked with red.

The female possesses a dark patch towards the centre of each side of her body, just below the commencement of the dorsal fin. She has flecked scales of alternating dark and light, in a pattern similar to a draught-board. She is overall much darker and yellower than the male, who has a general greeny-blue coloration. The posterior end of the female's dorsal fin has a small dark fleck outlined in white; the male lacks this pigmentation. The male's fins are generally more tapered and better developed than the female's.

This fish is best kept apart from other fishes, because the males tend to be aggressive.

They thrive in a small tank with plenty of plants, a dark bottom, and plenty of light, preferably sunlight. A single pair can be kept together, but if breeding is to be attempted it is always best to condition the fish first. They are sometimes quarrelsome but this is usually between two males concerning their territories.

*Algae* plays an important part in their diet as they are basically vegetarians, although live and dried foods are also essential. When *algae* cannot be obtained, boiled spinach can be used as a substitute.

They prefer slightly alkaline water with a mild peaty brown coloration, showing that the water is soft. Temperatures should be fairly low, from 65-72°F is ideal, but a temperature of 77-78°F is necessary for breeding.

The one disadvantage this fish has is its shyness. It prefers to dwell at the back of the aquarium behind rocks and plants, only coming out to feed, and in ideal conditions, breed.

It was two years ago that I decided to attempt to breed *Jordanella floridae*. After conditioning the fish



*J. floridae*, male above.

in separate tanks for a period of about three weeks, I was faced with a brightly coloured and energetic male, and a plump passive female. I cleared a tank of guppies and after part changing the water and adding peat, I set about 'decorating' the tank for this type of egg-laying toothcarp.

I used a small collection of rocks in one corner for the female to hide behind when the male became too persistent. For plants I chose *cabomba*, a few clumps of which were placed at the rear of the aquarium, and behind the rocks, and *bacopa*. This was placed in attractive groups towards the front of the aquarium. The filtration was undergravel, and the airstone was adjusted to allow a gentle stream of bubbles to break the surface.

The male was placed in the tank two days before the female. He surveyed the area, and then retreated behind the rocks. When the female was added he immediately came out and gave chase until exhausted, they both had a rest. The male was in his courting dress, all his scales shone, reflecting blue and green light, and his body was flecked with red. He was much redder, much bluer and greener than I had ever seen him before. He swam in front of her showing off his newly found splendour. She responded, and swam off allowing him to follow her.

The spawning started. Side by side they quivered at the base of the plants, the female releasing small numbers of sticky eggs, all joined together like a pearl necklace. While she was swimming with her beak from plant to plant, the eggs could be seen hanging from her vent, until eventually they were brushed off on some plants.

There then followed a few minutes respite to recover from their strenuous 'exercise,' before it was repeated once again. This went on for about three days. Sometimes three or four hours would pass without them spawning, then in the course of an hour they would spawn perhaps ten times.

They would probably have carried on spawning, but I was unsure as to when the eggs would hatch, so after three days I removed the female. She was by then much thinner, but still upset to be removed from her partner.

I left the male in the tank for another day because I had heard that he would fan the eggs; but upon watching his actions, it seemed to me that he was gorging on them! I decided to end his gourmet activities and removed him on the fourth day.

Two days passed, the eggs I could see were showing dark spots, which meant possible hatching shortly. Sure enough, the following day tiny quivering splinters of glass could be seen where the eggs had been the day before.

I waited patiently for two days, until the fry were free-swimming, and then added some 'Liquifry.' The

tank glass was getting a large growth of *algae* and it was difficult to see the fry.

During the next week I caught occasional glimpses of the young, which numbered about twenty. They were very shy and tended to hide in the plants. They were taking on the olive coloration of their parents and were the size of new-born guppies, although they were much more robust. Brine shrimp was now acceptable to them.

During the following week I saw less of the fry, and a fortnight after their hatching they seemed to have disappeared. In a foolish moment I placed a batch of new born guppies in the tank 'to grow them,' because I had assumed the American Flag fry dead.

A few days after putting the guppies in the tank, I sighted one of the fry. I decided to leave the guppies in the tank, hoping that the Flag fry would thrive. But, alas, as the guppies grew it became apparent that they were growing at the young Flags expense.

Disappointed that my attempt had failed, I was unable to try again because the female died.

To those who are thinking of breeding this fish, I warn you, have patience; if the fry disappear, wait a while; it might mean the difference between a batch of American Flags, or, in my case, a few guppies.

Finally, I would like to recommend this fish, as suitable for a small tank, even an unheated tank, if the room temperature does not fall below 60°F.

Although shy, when coming out to feed its true beauty can be seen.

It is an ideal beginner's fish in that it is very undemanding in its tank requirements.



THE AQUARIST

# NEW GROUP PLANS TO ENCOURAGE FISHKEEPING

The Aquatic Development Group has now raised sufficient funds from member companies to commence a programme of public relations activity intended to expand the hobby of fishkeeping throughout the U.K.

From 1st August, 1974, Fleet Communication Services, 107 Fleet Street, London, E.C.4 (tel: 01-353 1174) has been retained by the Group to undertake a sustained twelve months campaign of activity intended to reflect the objectives of the group by generating increased interest in the hobby. Initially F.C.S. obtained television coverage on the B.B.C.'s leading scientific programme "Tomorrow's World," which has an audience of eight million viewers.

Membership of the Aquatic Development Group is open to all manufacturers, importers, wholesalers and retailers involved with the aquatic trade. Formed by leading companies in the aquatic trade, subscriptions are based upon the type of business and the money raised is used to broaden interest in the hobby with a strong accent on attracting more members of the public to keep fish.

In addition to promoting the hobby on a national basis, the group will also offer advice and assistance to solve fishkeeping problems. The initial group mentioned include the following manufacturers: Phillips Yeast Products Ltd., King British Aquarium Accessories Co. Ltd., Arcadia Engineering Co., Interpet Liquifry Co. Ltd., John Allan Aquarium Ltd., UNO Products, Peterama Ltd., Thomas's Ltd., Pet Library (London) Ltd., T.F.H. (Great Britain) Ltd., and Armitage Bros. Ltd.

Each of the above have contributed £150 as a subscription.

Supa Aquatic Supplies and Brosiam Ltd. have contributed £75 and S. W. Hamilton £70, Livestock Importers and Walton Manor Fish Farm have contributed £150, Wingate & Golding Ltd. and Aquatic Nurseries Ltd. have each contributed £100 in subscriptions.

The following leading wholesalers have each contributed a £50 subscription: Waterlife Research Ind. Ltd. (inc. SeAquariums), R. Aitchison & Co. Ltd., H. Morris & Sons Ltd., Barry M. Austin & Co., Blagden Water Garden Centre Ltd., Walter R. Smith Ltd., R. J. Cook, Wholesale Aquatic Supplies, Newpet Ltd., Woodpecker Pet Products Ltd., Petstocks Ltd., Midland Pet Supplies (Nantwich) Ltd. and Fenholme Pet Foods. In addition, the wholesaling division of Keith Barraclough Aquarist Ltd. has contributed a further £92.

The following retailers: Mr. B. V. Thomas, Coral Reef Tropical Fisheries, 169 Winn Street, Lincoln LN2 5EW, Mr. A. Checketts, Pets & Supplies, 5 Crescent Road, Worthing, Mrs. S. M. Dell, Bourne End Aquarium, 24 Furlong Road, Bourne End, Bucks., Mr. and Mrs. R. Fox, Rosedale Aquatics, Eathorpe, Nr. Leamington Spa, V. Carruthers, Going Tropical, Belfast, Mr. P. Stonham, Putney Poodle Boutique, Mr. K. L. Witt, Woodhatch Pets Aquarium Supplies, and Mr. R. H. Pathey-Johns, Small Livestock Supplies Ltd., 32b Queen Street, Wolverhampton, have all subscribed £10.

To provide an opportunity for subscribers and other interested parties to meet and discuss the group's aims for 1974/75, a cocktail party is being arranged to coincide with the Pet Product Marketing Show. In addition to a presentation of the group, main aims time will be available for an open forum discussion of objectives. The meeting will be held between 8.30-9.30 p.m. on Sunday evening in the Greenwich Suite, Second Floor, West Centre Hotel, Lillie Road, London, S.W.6.

The group will eventually work towards the production of an approved directory for the Aquatic trade which will list all members contributing to the expansion of the hobby.



# THOLLON'S CICHLID

## NOTES ON BREEDING THIS COLOURFUL *TILAPIA* SPECIES

by Paul S. Jones

THOLLON'S CICHLIDS or *Tilapia tholloni* were first discovered by Sauvage in 1884; their natural waters span Tropical West Africa from the Cameroons to South of the Congo. This is a species not too often imported into this country and I think this is attributable to the lack of interest shown towards the *Tilapia* genus by the majority of British aquarists. Not all *Tilapia* grow too large for the average aquarium and *T. tholloni* has not been found to exceed 18 cm. in the wild so that a pair may be safely housed in a three-foot aquarium. They present a brilliant show-off colour when in breeding dress, and their habits and behaviour patterns can be very interesting.

I first came across *T. tholloni* in the "rough" tank of my local aquarist shop and I was immediately attracted to them by their highly brassy coloration and unusual shape. I purchased a pair, and after an uneventful journey home, put them in a three-foot tank. The water was soft with a pH of 7.2-7.4, the other occupants of the tank included a pair of Firemouth, two bronze catfish and a pair of Kribensis. The *Tholloni* appeared to be settling in well until I introduced a full *tubifex* feeder which they immediately monopolised, driving away all would-be transgressors, while gorging themselves at the same time. I allowed this to continue as I reasoned that once they realised there was enough food for all, they would ease up on being so greedy. This proved to be the case and after two or three days they allowed the other occupants of the tank to feed at will.

Up until this time I had never experienced any real success at growing plants in my aquaria; however,

two months previously I had been given a stem of Indian Fern and two Amazon Swords. The latter hadn't made any great improvement while the Indian Fern was growing very nicely.

I was particularly proud of the Indian Fern as it seemed to be my first real success with plants. Two days later I returned home to find all my plants cropped to the roots! The *tholloni* had had a feast! Let the inexperienced take this as a warning. *Tilapia* love soft green vegetation, (they also like hard green vegetation). If they can bite it into digestible pieces, it's as good as digested! I have been told that a certain member of the *Tilapia* genus eats plastic plants, (a case of seeing is believing, I think).

During this time the *tholloni* had settled in well and had wasted no time in establishing just over one half of the tank as their territory. This half was well furnished with slate hiding places and a rock to spawn on. I started conditioning them on a diet of whole lettuce leaves, *tubifex*, *daphnia*, white worm, beef heart, lots of earthworms, and the occasional pinch of flake food. They never refused anything I offered them, and I can well believe stories I've heard from Africa of schools of them waiting for the droppings of river bound cattle.

After two months the *tholloni* were in prime condition. They underwent a complete change of appearance which culminated in a brilliant display of breeding colours. The female exhibited two horizontal and nine dark vertical bars, while the male showed only nine dark vertical bars (the two horizontal

bars being so faint as to be near invisible). Both fish changed from their normal overall green-yellow, brassy appearance to a predominantly red and green, and their bellies warmed to a pink-red, the female's being the brighter. The blue-black bordering almost completely surrounding the yellow ocellus of the dorsal deepened in colour, (this incidentally just touches the fourth vertical bar from the caudal peduncle) and a beautiful iridescent light blue stripe shows from the bottom of the gill plate to the mouth, and extends on to both lips at the corner of the mouth. The edge of the dorsal becomes tinged with red and yellow flecks, while the underside from the mouth to the seventh vertical bar from the c. peduncle turns a deep blue-black. The ventral fins and the lower parts of the anal and caudal also assume a deep blue-black. The remaining anal and caudal areas are covered with yellow and blue spotting, and red lines (or rays) of differing lengths. All in all, quite a show for those aquarists lucky enough to see it!

This display of breeding colour was followed by the emergence of both ovipositors to a length of about three millimetres, the males being typically more pointed than the female's. The finnage and structure appear to be identical in both sexes, the only appreciable differences apparent to myself, is the belly of the male being straight while the female's has the characteristic rounded belly of most female cichlids. This becomes most apparent after a good feeding, as the male's belly still remains fairly straight, while the female's bulges. The exception to this rule is at breeding time when sex may be determined either by the ovipositors, or the lack of horizontal barring on the male.

With colours and ovipositors showing, the pair began their pre-spawning play. They did much swimming side by side while quivering violently from head to tail. The male selected the rock as the spawning site, and proceeded to try and attract the female's attention to it by quivering while hovering over it. Occasionally he would rub his belly on it. This behaviour eventually did the trick and the female showed her approval by helping him to clean the rock. Shortly after this I noticed that the female would occasionally mouth the male in the area of his c. peduncle and I took this as a sign that all was in preparation for the spawning.

7th June, 1974. At this stage I removed all the other occupants of the tank and the next day the pair started excavating gravel from all over the tank and piling it against the full length of the front glass. This continued for a solid three days, by which time a wall of a uniform height of seven inches had been built along the front glass!

As the pair did not seem to be letting up on the building of this wall, I assumed they wouldn't spawn until they were completely hidden and to supplement their

efforts I taped a piece of brown paper to the front glass to a height of ten inches. The next afternoon (the thirteenth) I returned home to find them laying the last of a batch of approximately five hundred eggs. These were two millimetres in diameter, of a light brown colour, and having a white spot at one end. I was surprised at the size of the spawning as I had assumed that it would be about 100-150 eggs. This assumption was based on information gleaned from the new double volume Sterba which states "mouth brooding is probably undertaken by the female." This was not the case. Five hours after spawning I removed the eggs to a two gallon tank filled with water from the spawning tank and to this I added Methylene Blue. An air stone was then placed next to the eggs to ensure that a good circulation of water passed over them.

15th June. Approximately 100-150 eggs have fungused. This was directly attributable to many of the eggs on one side of the rock being laid four and five deep. I removed the fungused and infertile eggs by scraping them off the rock and lifting them out with a pipette. The eyes are visible on the remaining eggs.

6 p.m. Fifteen or twenty tails can be seen waving about.

8 p.m. The eggs are hatching *en masse*.

10.30 p.m. The whole rock is alive with a scintillating mass of tails.

At this time fungus was rampant in the batch and I felt that radical action was called for. Fungistop and 150 mg of ampicillin were added.

16th June. Half of the fry are now off the rock and wriggling about on the bottom of the tank. They appear to be "all belly" with just a slight tail. Where the head should be there are two tiny eyes on "stalks." The fry are now approximately five millimetres long.

17th June. All the fry are now hatched and the shotgun treatment of Fungistop and Ampicillin seems to have cured the fungus and perked up the fry. However, I must admit that I lost a fair number of the fry.

By the twenty-first of June the fry were free swimming and I started feeding heavily with brine shrimp. This was followed by sifted *daphnia*, chopped *tubifex*, and eventually dry foods. On the fifth of July they measured five-eighths of an inch and were easily golloping down medium-sized *daphnia*. Out of the approx. 500 eggs I have raised 146 fry. It is now two and a half months since spawning and the young *tholloni* are beautiful one and a half inch rainbow replicas of their parents. I shall be swopping, or selling, some of them to the shops soon. If you come across them don't make the mistake of labelling them "just" *Tilapia*. Their peaceable nature, beautiful colouring, and highly intelligent behaviour make them an outstanding member of the *Tilapia* genus, and well worth having.



# MARINE QUERIES

by Graham F. Cox

## READERS' SERVICE

All queries **MUST** be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex TW8 8BN.

I have been keeping tropical fish for two years and decided to have a go at keeping marines. I bought an all glass aquarium 27½ in. × 15 in. × 12 in. and use the semi-natural system powered by an Esha SP202 pump. The tank holds 17½ gallons approximately but with coral-sand, decoration, etc., it holds exactly 16 gallons. I bought two Electric Blue Damsels (*P. caeruleus*) and one Domino Damsel (*D. trimaculatus*). Please could you advise me as to what other species I could add which is colourful and reasonably hardy after my system has matured (three weeks old at the time of writing). Could you also advise me of a good medication to add while the nitrite reading in my new system persists (I wish to add invertebrates later).

I note that your tank must be now fast approaching bacterial maturity after three week's running. One day soon you will find that, within the space of 20-30 hours, your nitrite reading falls quickly to zero—where it will remain henceforth unless you too suddenly increase the biological loading on the filtration system. In stating the above, of course, I am assuming that the tank's nitrification potential, as determined by turnover rate, oxygen tension, depth of filter-bed and type of filtrant material, etc., is adequate for the loading which you are imposing on it.

### Advised stocking for first 6-12 months

Do not exceed 4 in. of fish but once the nitrite reading has fallen to zero and remained thereat for seven consecutive days, you may add all the invertebrates you wish, except that you shouldn't have any more than one of the gross-feeding invertebrates (e.g. Octopus spp., anemones, large crustaceans), and even this one specimen should be as small as possible in such a diminutive sea aquarium. The reasons behind

this are that the other invertebrates are largely filter-feeders (e.g. living corals, tube worms, clams, etc.) or browsers (e.g. starfishes, sea-urchins, sea cucumbers, etc.) and, as such, constitute only a very small biological loading factor on your system. In fact, we find that the most successful means of maintaining the filter-feeders is never to feed them directly at all. All we do is to provide a very high plankton count in the seawater by usage of "SEAGREEN" as a phytoplanktonic fertilizer and "SEAVITA" as a "fertilizer" for both the phyto and zooplankton. We have found out the expensive way (i.e. by heavy losses), that periodically squirting quantities of fry-foods and/or home-made broths onto their frequently delicate tissues simply destroys them—probably as a result of creating localised high nitrite/ammonia toxicity as these quantities of organic matter decompose.

After all, when you think about it, no one goes around on the coral reefs squirting rubber sacs-ful of decomposing organic matter into the "faces" of filter-feeders, do they?

The living corals, etc., simply extract phyto-, nanno-, and zooplanktonic organisms from the surrounding seawater as they now do in my own tanks. Another incidental "bonus" worth mentioning in this method of feeding filter-feeders, (i.e. naturally generating vast quantities of planktonic organisms by using "SEAGREEN" and "SEAVITA"), is that the viable life of our synthetic seawater is lengthened by several weeks as compared with the days when we used to pour great quantities of "soups" and "broths" into the tanks.

Now with regard to fishes, during this critical first 6-12 months in which you are learning methods and acquiring skills and knowledge that will stand you in

good stead for the rest of your fish-keeping life. Do not exceed a fish culture density of 1 in. of fishes to each four gallons of seawater. Thus the maximum space allowed you is 4 in. of fish (in a 16-gallon tank) and I fear you are up to this level already. I have known exceptionally gifted beginners who have ignored this advised fish culture density rule and gone onto my ultimate maximum of 1 in. of fish to each two gallons of seawater as soon as their nitrite reading had vanished, indicating bacterial maturity. Whether or not you belong amongst this small fraternity of sea aquarium supermen only you can decide.

#### Advised stocking after initial 6-12 months

By now you will have accumulated all the invertebrates your tank can accommodate, will have 6-12 months of experience under your belt and can push your stocking culture density to its ultimate limits, (i.e. 1 in. of fish to 2 gallons of seawater) if you so wish. With 16 gallons of water, this means 8 in. of fish minus say the 3 in. of damsels you already have, leaves 5 in. of space remaining. To use up this space I would recommend the following fishes in declining order of suitability for a beginner:—

**Centropyge genus**—*C. bispinosus* (Coral Beauty), *C. heraldi* or *C. flavissimus* (Lemonpeel—Filipino or Tahitian), *C. eiblii* (Peacock Dwarf Angel), *C. loriculus* (Flame Angel—very tough but frighteningly expensive for a beginner), *C. tibicen* and lastly *C. bicolor*\* (Oriole Angel). A juvenile specimen of any of these fishes will use up 1½ in. to 2 in. of space.

**Surgeons and Tangs**—*Zebrasoma scopas*\* (Mink Tang), *Acanthurus lineatus* (Pyjama Surgeon), *Paracanthurus hepatus* (Regal Tang), *Zebrasoma beliferum*\* (Sailfin Tang), *Acanthurus glaucopareus* (Powder-brown Surgeon), *Acanthurus leucosternon* (Powder-blue Surgeon), *Acanthurus achilles* (Achilles Surgeon). Any one of these fishes will nibble at your algae from time to time, but provided it is given plenty of Tetramin Conditioning Food (green flake) and spinach, lettuce, etc., and provided that regular dosage with "SEAGREEN" and "SEAVITA" is maintained and that the lighting is adequate in intensity, colour, temperature and duration, the rate of growth of the algae should exceed the rate of depredation by the surgeon or tang. The fish selected should be a juvenile specimen not exceeding 2-2½ in.

**Moorish Idols**—same remarks as for Surgeons and Tangs above.

**Butterflies**—all fishes belonging to the genera *Chaetodon*, *Parachaetodon*, *Forcipiger*, *Chelmon*, *Parachelmon*, *Heniochus* and related genera should be avoided. All species within these genera tend to eat certain invertebrate species, (Coelenterates, Sponges, etc.), and are not really suitable for inclusion in a complete sea aquarium.

**Batfishes**—species within the genus *Platax*—same remarks obtain as for Butterfly fishes above.

**Wrasse**—all members of the genera *Coris*, *Bodianus* and *Anampses*\* which I have kept with invertebrates have been successful. Members of the *Thalassoma* and *Gomphosus* genera, however, will often nibble at living corals, etc., if they are unfed for sometime or inadequately fed over a period of time. Parrotfishes are strictly out of order in a complete sea aquarium as they will eat almost any invertebrates they can catch or find.

**Triggerfishes**—same remarks apply as for Parrotfishes above.

**Filefishes**—*Oxymonocanthus longirostris* (Orange-spotted Green Filefish) are safe in a complete sea aquarium, provided that they are supplied adequate food in the way of frozen Artemia, freeze-dried Artemia, mosquito larvae, *Daphnia*, well-washed species of filefishes in a complete sea aquarium yet, *Tubifex*, white-worm (*Enchytrae*) etc. I have not tried other species of filefishes in a complete sea aquarium yet, and would welcome reader's experiences in this and other regards.

**Lionfishes (Dragonfishes)**—member of the genera *Pterois*, *Dendrocheirus* and related genera are quite safe in a complete sea aquarium provided that they are not able to catch any of the smaller fish inhabitants.

**Clownfishes**—member species of the genera *Amphiprion* and *Premnas* are perfect inhabitants of a complete sea aquarium and do not eat any of the show invertebrates, i.e. this does not mean to say that they will not eat any small crustaceans, e.g. sand-hoppers, etc., which might crawl out of living rocks, etc. They will eat any such macro-planktonic organisms as they can catch, as also will almost all the corals listed in this article.

**Damsel-fishes**—all are suitable for inclusion.

**Groupers, Basslets, etc.**—all are suitable for inclusion provided that they are not large enough to capture the smaller fishes in the tank. Two particularly good examples of fishes which are ideal in this category are the Royal Gramma (*Gramma loreto*) and the Blackcap Gramma (*Gramma melacara*). Both are beautifully-coloured fishes, not too aggressive, and completely at home in the nooks and crannies of the spatially-complex topography which all good complete sea aquariums eventually become.

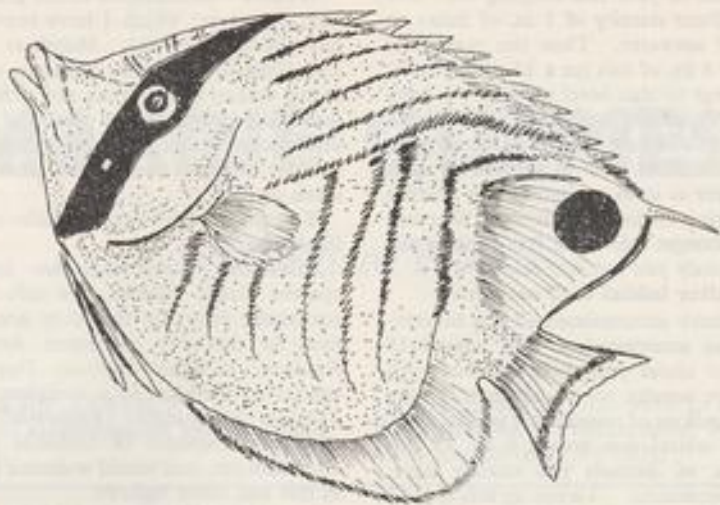
**Blennies, Gobies and Dragonets**—all are prime candidates for inclusion. Particularly noteworthy because of their lovely colours and intriguing "personalities" (i.e. behavioural characteristics) are the Mandarin Dragonet (*Synchiropus splendidus*), and the Orange-tailed Blenny (*Ecsenius bicolor*) and the Scooter Goby from the Philippines.

**General Families**—the following are all suitable members of a complete sea aquarium:—

*Mirolabrichthys tuka* (Purple Queen)

*Anthias* spp. (Wreckfishes)

(Continued on page 329)



## *Chaetodon auriga*

by H. G. B. & Q. G. B. Gilpin

COMMONLY KNOWN AS the Golden Butterflyfish and occasionally referred to as the Threadfin Butterflyfish, this gloriously coloured and fascinatingly shaped creature, hailing from the Indo-Pacific, Red Sea and E.African coastal waters, is highly popular with marine aquarists.

Like other members of its family, composed of some 100 species, the Golden Butterfly, although deep bodied, is much compressed laterally enabling it to slide easily into cracks and crevices in the coral reefs which form its native habitat. A feature of this fish is its elongated snout, particularly in evidence when it halts, body held slightly obliquely, head downwards, pointing towards suspected danger or cautiously examining potential food. Its maximum overall length is between seven and nine inches.

The silvery hue of the head and fore part of the body merges into orange posteriorly. The dorsal fin, yellow anteriorly, changes to orange edged with black towards the rear. The caudal and anal fins are also orange, rimmed with black. The pectoral and ventral fins are a silvery blue. Yellow bars across the front of the head which also carries a black bar, extending completely across it and passing through the eye. The sides of the fish are barred obliquely with black. Adults have a large black spot on the dorsal fin and some dorsal fin rays are extended into

a long filament reaching beyond the tail. The young closely resemble the adults but lack this filament.

Our pair reached us some months ago. Although they are described as hardy and catholic feeders, to begin with we had some difficulty in persuading them to eat. They soon settled down, however, and it was not long before they were taking frozen mysus shrimps, at first with some reluctance, but later with enthusiasm, chewing on the food with their bristle-like teeth and spitting out the heads. These teeth are employed under natural conditions for biting off the coral polyps and for this reason Butterflyfish should not be confined with living corals, small anemones or tube worms.

Golden Butterflyfish have a reputation for being strongly aggressive towards other members of their own species and we soon found that this reputation was thoroughly deserved. Initially our pair were placed in a 39 in. x 15 in. x 12 in. aquarium, kept at 75°F. and well furnished with dead coral, so placed as to provide ample retreats for any fish that might need them. It became immediately apparent that this situation would not be tolerated. Quarrels broke out at once, each fish, with dorsal fin fully erect, sailing into the other. One of the pair rapidly gained ascendancy, its whole body assuming a pink suffusion as it pressed home the attack. This flush

of pink was only observed on the dominant fish, its oppressed rival showing no change of coloration whatever.

To prevent a continuation of the battle and inevitable damage to the weaker fish, they were separated without further delay. This was done by placing a perforated plastic shield across the middle of the aquarium, dividing it into two halves, each of which was occupied by a single Butterflyfish. One was left entirely by itself and the other shared its accommodation with a male Mandarin and two Cardinals.

The new arrangement solved the problem and peace reigned throughout the aquarium. The inhabitants of the community half ignored each other indicating that this specimen of *C. auriga*, at least, is only aroused to pugnacity by members of its own family.

Further experience indicated that Pyjama Cardinals are not entirely satisfactory companions for Golden Butterflyfish as, although the two species live together amiably enough, the greediness of the fast-swimming, large-mouthed Cardinals at feeding times seriously reduces the food supply available to the more hesitant

and slower moving Golden Butterflies. Where the two species are kept together a careful watch must be maintained to ensure the latter receive sufficient nourishment. Indeed, we are inclined to suggest that whenever a Butterflyfish is introduced to a community tank, close supervision should be the rule until it is evident that no territorial bullying takes place and that the Butterflyfish are accepting an adequate amount of food.

Successful breeding of *C. auriga* in confinement appears to be very unlikely, very little being known of their reproduction even in a state of nature. It seems more than probable that they will not even spawn unless they have living corals and allied invertebrates to feed upon.

As aquarium fish, Golden Butterflyfish are delightful and although they should have sufficient retiring places in which to hide if necessary, they will spend most of the daylight hours swimming freely in the open parts of the aquarium, exposing their brilliant colour patterns to great advantage.

## MARINE QUERIES (continued from page 327)

Seahorses (*Hippocampus* spp.)

Pipefishes (*Dunckerocampus* and related genera)

*Lo vulpinus* (Badgerfish or Foxface)

\**Plectorhynchus* spp. (Sweetlips).

The above has given you a considerable range of fishes to select from all of which should be suitable for a complete sea aquarium. However you should bear in mind two factors before making a selection, as follows:—

- (a) Those fishes marked with an asterisk \* are inclined to include specimens of widely varying temperaments and, exceptionally, speci-

mens may be encountered which become a source of damage to certain species of invertebrates.

- (b) Remember that you have only a maximum stocking availability of 5 in. total—so choose thoughtfully and well.

The only medication which I know of which is safe to use in a complete sea aquarium or a system destined to become a complete sea aquarium is "STERAZIN." Even then, "STERAZIN" will kill almost all crustaceans and must never be used in a tank containing them.



### A DATE FOR YOUR DIARY

THE FEDERATION OF SCOTTISH AQUARIST SOCIETIES

present

## THE 3rd SCOTTISH AQUARISTS' FESTIVAL

at the CIVIC CENTRE, MOTHERWELL near GLASGOW

on

SATURDAY AND SUNDAY - 29th, 30th MARCH, 1975

Full Details and Schedules from:- D. Fotheringham Esq.,  
23 Royal Park Terrace, Edinburgh EH8.



# News from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarist societies' for inclusion on this page should reach the Editor by 5th of the month preceding the month of publication.

AT the September meeting of the Mid-Sussex A.S. the chairman, Mr. D. Soper, announced that next year the Society would meet on the second Thursday in each month and not the third, due to the premises being under new ownership and the hall not being available.

Members were reminded to enter their tanks in the Home Aquaria competition which will take place in November. The membership held an Open Discussion evening, whilst F.B.A.S. judge Mr. J. Mathison judged the fish. The highest-pointed fish belonged to Mr. and Mrs. Birtles. Any further information on the Society may be obtained from the Secretary, Mr. J. Reeves, 36 Rumbolds Lane, Haywards Heath, tel: 3702.

MEMBERS of the Portsmouth A.S. were welcomed by the Chairman of the Bournemouth A.S. when they arrived to take part in the A.S.A.S. quiz. The questions were set by the Salisbury A.S., and at the end of the Quiz, Bournemouth had won by 37½ pts. Table Show results: A.V. Characin: 1 and 2, Mrs. Bebb; 3, K. Gibbs. Tropical Pairs: 1, Mrs. Bebb; 2, Mr. Chatfield; 3, Mr. Middleton. Common Goldfish: 1 and 2, B. Coombes.

IN July, Sittingbourne and District A.S. had a most interesting slide and tape lecture on "Corydoras" by C. Brown, which was enjoyed by all. Also in July a Table Show was held and judged by Ann McDonald (Sittingbourne). Result: Classes G.H.: 1, 2, 3 and 4, A. Sharp. A special award was given to the Myrcoglanis paraguayae in first place. Classes T.M.: 1, 2 and 4, P. Floyd; 3, G. Wicks.

A visit to Mid-Kent A.S. in August for a K.A.A.S. League match went well for Sittingbourne, who won all three classes and took the match with 40 pts. to 8 pts. During August there was a visit from N. Kent A.S. for a K.A.A.S. League match which resulted in a win for the home society by 31 pts to 23 pts.

The table show was for the "Challenge Cup" and was judged by Ian Mathison (Tonbridge). Results: 1, Miss Diane McDonald; 2 and 3, B. Newman; 4, A. Sharpe. The Junior Challenge Shield also went to Diane McDonald as the highest-pointed Junior, and the Novice Trophy to Master Mark Wicks as best Novice.

THE Killingworth A.S. now meet fortnightly at the newly opened Communicate Centre, Killingworth, on Wednesdays. The committee remains unchanged and any enquiries should be made to the Secretary, Miss C. S. Hickman, 14 Crumstone Court, Killingworth, Newcastle upon Tyne NE12 0SZ.

ENTRIES for the seventh open show of the Nuneston A.S. totalled 463. The award for Best Fish in Show went to a Butterfly Fish the owner being Master Kevin Marshall from Northampton. Results: Male Fighters: 1, Mr. and Mrs. G. Hayes (Hinckley); 2, Master S. Watts (Coventry); 3, Mr. Goode (Independent); 4, Mr. Mayle (Chelmsley). A.O.V. Anabantid: 1, C. Nightingale (M.T.A.); 2, Mr. Bailey (Coventry); 3, C. R. Chamberlaine (Leamington); 4, Mrs. P. Hinde (Coventry). Characins: 1, Mr. Mayle (Chelmsley); 2, C. Nightingale (M.T.A.); 3, R. Phillips (M.T.A.); 4, M.

Nightingale (Tamworth). A.O.V. Characin: 1, A. Simmons (Coventry); 2, C. Nightingale (M.T.A.); 3, D. White (Bedworth); 4, Mr. and Mrs. M. Short (Nuneston). Cichlids: 1, Mr. and Mrs. Ward (Banbury); 2, Mr. and Mrs. G. Cox (Nuneston); 3, R. Phillips (M.T.A.); 4, C. Nightingale (M.T.A.). Angel Fish: 1, T. D. Chambers (W.A.D.A.S.); 2, Master S. Watts (Coventry); 3, Mr. Short (Coventry). A.O.V. Cichlid: 1, G.V.S.R. (Chelmsley); 2, J. Goodman (Lower Gornal); 3, A. J. Crew (W.A.D.A.S.); 4, M. Crew (W.A.D.A.S.). Barbs: 1, Mr. and Mrs. G. Cox (Nuneston); 2, Mr. and Mrs. Bull (Derby); 3, M. Nightingale (Tamworth); 4, R. Phillips (M.T.A.). A.O.V. Barb: 1, Mr. and Mrs. Bull (Derby); 2, Mrs. P. Hinde (Coventry); 3, R. Phillips (M.T.A.); 4, Mr. and Mrs. G. Nesbitt (Goodyers End). Catfish: 1 and 4, G.V.S.R. (Chelmsley); 2, J. Goodman (Lower Gornal); 3, Mr. Bailey (Coventry). A.O.V. Catfish: 1 and 3, Mr. Mayle (Chelmsley); 2, M. Nightingale (Tamworth); 4, T. A. Cruickshank (Ealing). A.V. Loach: 1 and 3, Mr. and Mrs. Nesbitt (Goodyers End); 2, Mrs. M. Crew (W.A.D.A.S.); 4, J. Goodman (Lower Gornal). A.V. Swordtail: 1 and 2, Mr. Mayle (Chelmsley); 3 and 4, D. White (Bedworth). A.V. Platy: 1, 2 and 4, D. White (Bedworth); 3, Mr. Mayle (Chelmsley). A.V. Molly: 1, Mr. and Mrs. G. Hayes (Hinckley); 2, Master N. Coleman (Independent); 3, R. Marshall (N.A.D.S.); 4, T. D. Chambers (W.A.D.A.S.). A.V. Guppy: 1, Mr. Elliott (C.A.D.E.S.); 2, Mrs. P. H. Chambers (W.A.D.A.S.); 3, C. W. Poole (Banbury); 4, T. D. Chambers (W.A.D.A.S.). A.O.V. Livebearer: 1, D. White (Bedworth); 2, Mrs. D. Cruickshank (Ealing); 3, C. W. Poole (Banbury); 4, R. Marshall (N.A.D.S.). Livebearers (Pairs): 1, C. Nightingale (M.T.A.); 2, Mrs. W. Moore (Bedworth); 3, Mr. and Mrs. R. Impey (Hinckley); 4, R. Marshall (N.A.D.S.). Biggler (Pairs): 1, Mr. Elliott (C.A.D.E.S.); 2, C. Nightingale (M.T.A.); 3, Mr. and Mrs. Nesbitt (Goodyers End); 4, D. White (Bedworth). A.V. Rasbora: 1, 2 and 3, D. and H. (Independent); 4, P. Grosvenor (Runnymede). Danio and W.C.M.M.: 1 and 2, Mr. Elliott (C.A.D.E.S.); 3, T. A. Cruickshank (Ealing); 4, D. and H. (Independent). A.V. Killie: 1, R. J. Farmer (Wednesbury); 2, Mr. and Mrs. G. Cox (Nuneston); 3, Mr. Walker (Coventry); 4, Mr. and Mrs. Borill and Sons (Lincoln). A.O.V. Tropical Fish: 1, P. Grosvenor (Runnymede); 2, Mr. and Mrs. Bull (Derby); 2, D. and H. (Independent); 4, Mr. and Mrs. G. Hayes (Hinckley). Junior A.V. Egglayer: 1, Master K. Marshall (N.A.D.S.); 2, C. Pratt (Bedworth); 3, Master I. Short (Nuneston); 4, E. Baxter (Hinckley). Junior A.V. Livebearer: 1, Miss S. Goodman (Lower Gornal); 2, Master N. Coleman (Independent); 3, Master Fisher (Tamworth); 4, Master I. Short (Nuneston). Breeders A.V. (Egglayer): 1 and 2, Mr. and Mrs. G. Hayes (Hinckley); 3, R. and P. Hirst (Coventry); 4, Mr. Mayle (Chelmsley). Breeders A.V. (Livebearer): 1 and 2, D. White (Bedworth); 3, Mr. and Mrs. G. Hayes (Hinckley); 4, Mr. and Mrs. T. Redfern (Hinckley). Single-Tail Goldfish: 1, A. J. Crew (W.A.D.A.S.); 2, Mrs. M. Crew (W.A.D.A.S.); 3, Master S. Watts (Coventry); 4, Mr. and Mrs. Bull (Derby). Twin-Tail Goldfish: 1, R. Shakespeare (Bedworth); 2, Mr. and Mrs. R. Impey (Hinckley); 3, C. Pratt (Bedworth). A.O.V. Coldwater Pond or River Fish: 1 and 3, C. Pratt (Bedworth); 2, Mr. and

Mrs. Watts (Coventry); 4, Mr. C. W. Poole (Banbury).

RESULTS of the Bracknell, Didcot and Reading Open Show were as follows:

Class A.G.: 1, 2 and 3, K. Lewis; 4, Mrs. J. Jupe. Class B: 1 and 4, K. C. Smith; 2, M. H. London; 3, J. H. Jackson. Class Bz: 1, Mr. Bisson; 2, R. Leslie; 3 and 4, K. Bisson. Class Ca: 1 and 2, R. Cox; 3, S. J. Rigby; 4, L. J. Brazier. Class Cc: 1, T. D. Hewitt; 2, P. A. Moya; 3, A. Davidson; 4, T. Winter. Class Dc: 1, T. Winter; 2, J. G. Dickinson; 3, L. Morris; 4, T. Taylor. Class Db: 1, J. Clarke; 2, B. Bisson; 3, T. Winter; 4, E. Rushbrooke. Class Dc: 1, and 4, K. Rees; 2, L. Little; 3, T. A. Butler. Class Dc: 1, P. Brown; 2, I. Pierce; 3, P. Saunders; 4, F. Farnell. Class E: 1, I. Pierce; 2, K. Rees; 3, K. Bisson; 4, J. Bailey. Class E: 1, L. J. Brazier; 2, A. P. Taylor; 3, R. J. Canning; 4, J. B. Smith. Class F: 1, R. W. Dunoo; 2, P. Roberts; 3, P. Merritt; 4, R. Norris. Class G: 1, F.G.: 2, J. G. Dickenson; 3, P. Saunders; 4, F. Farnell. Class H: 1, Mrs. J. Lloyd; 2, Miss K. Howell; 3, L. J. Brazier; 4, May Netherell. Class J: 1 and 3, I. Clark; 2, K. Rees; 4, J. Bailey. Class K: 1, B. Bisson; 2, T. Fraser; 3, P. A. Moya; 4, J. H. Jackson. Class L: 1, 2 and 4, M. Carter; 3, R. Leslie. Class M: 1, L. Clarke; 2, May Netherell; 3, M. H. London; 4, J. Bailey. Class N: 1, W. A. Cowburn; 2, R. Cox; 3, I. Clarke; 4, J. Bailey. Class No-1: 1, A. E. Westin; 2, T. Fraser; 3, B. Bisson; 4, P. Merritt. Class O: 1, A. P. Taylor; 2, K. P. Hale; 3, May Netherell; 4, P. Merritt. Class P: 1 and 3, R. Cox; 2, S. J. Rigby; 4, P. Merritt. Class Q: 1 and 2, I. Pierce; 3, A. P. Taylor; 4, R. J. Canning. Class R: 1, G. Lester; 2, P. Cripps; 3, K. Bisson; 4, T. Cripps. Class S: 1, M. D. Chapman; 2, L. Little; 3, T. Taylor; 4, B. Saunders. Class T: 1, B. Bisson; 2, M. H. London; 3, L. Little; 4, T. Fraser. Class U: 1 and 4, P. Pinder; 2, D. Haines; 3, R. J. Rudland; 4, A. Green. Class V: 1, J. Jupe; 2, T. A. Butler; 3 and 4, P. Pinder. Class X: 1, D. Sheridan; 2, P. A. Moya; 3, P. Roberts; 4, I. Pierce. Class X-2: 1, C. Masters; 2, A. E. Smith. Class Y: 1, T. Cripps. Class Z: 1, J. Jupe; 2 and 4, L. Little; 3, T. D. Hewitt.

THE Manchester Section of the Fancy Guppy Association meet on the first Sunday afternoon of the month at 2.30 p.m. in the Tudor Room, The Longstaff Hotel, Belle Vue, Manchester. At the September meeting Mr. A. Charlton answered questions on the basics of Guppy breeding which were of benefit to the newer members. The next meeting of the section will be 3rd November.

THE table show held in September by Llantwit Major A.S. proved a great success with 68 entries. In conjunction members were also competing for the club's perpetual trophies. While the judging was in progress members were entertained with a slide show by R. Newton. The standard of the slides was excellent.

The results were as follows: A.O.V. Egglayers: 1, H. Chick; 2, A. Ibbertson; 3, S. Nelson; 4, G. Lewis. A.O.V. Livebearers: 1, 3 and 4, A. Ibbertson; 2, Master John Edwards. Breeders (Egglayers): 1, G. Lewis; 2, S. Nelson; 3, N. Hayley; 4, D. Wigg. Breeders (Livebearers): 1 and 2, A. Ibbertson; 3, S. Nelson; 4, R. Newton. Judges: J. Hiff (C.N.A.A./F.B.A.S.); C. Short (C.N.A.A./F.B.A.S.).

THE Association of Goldfish Breeders held their first annual general meeting recently. The members felt satisfied with the club's first year efforts and what was most noticeable was the friendly atmosphere within the club which seems to be lacking in the hobby at the moment. The show secretary reported that members had some success in open shows. After the officers were re-elected A. Sawman displayed some young lionheads which had contracted an unusual disease. Members

suggested remedies which will be tried and he will report back next meeting.

Table shows are held every month and the result for the year was as follows: 1, L. Clements; 2, I. Fleming; 3, H. Bence. The Secretary is G. Fleming, 3 Rutland Road, London, E.11.

**RESULTS** of the last table show of the Barry A.S. towards the year's points trophies results were: 1, 2 and 4, Master Jonathan Webber; 3, M. C. Guthrie. The trophy for the highest number of points went to Mr. M. C. Guthrie and the award for the highest number of points trophy for a junior member was won by Master Jonathan Webber.

The club night ended with a slide show of Mr. W. Gorwell's slides on Tropical Catfish.

**SPEAKER** for the evening at the Bradford & District A.S. September meeting was Dr. P. Lewis and he gave a lecture on the many kinds of fish that he has come across during the time that he has been following the hobby of Fishkeeping. Dr. Lewis illustrated his lecture with some of his colour slides. Many of the fish were of species not seen very often around the area and on most of the slides he was able to point out the ways there were to see the fishes.

Being a chemist, Dr. Lewis had made some of his own cures for the various diseases that can occur in the best regulated tanks, and these he had made up for sale to the various society members that he talked to from time to time. Most of the cures were comparable with those on the market nowadays and a few that were not available from any source.

**THIRTY-EIGHT** clubs participated in the Bethnal Green A.S. Silver Jubilee Open Show which proved to be a great success. The entries totalled 655.

The F.B.A.S. championship class was won by D. Stokes of Tyne Tees A.S., Best Fish in Show and Best Exhibit by a lady, awards went to May Netherell and the highest pointed society winners (except B.G.A.S.) was Walthamstow and District A.S. Results were as follows:—  
Class Aa-b: 1, June Salisbury; 2, P. Elson.  
Class Ad-e: 1, P. Elson; 2, June Salisbury; 3, F. Jacobs; 4, P. Flintoff.  
Class B: 1, Mrs. Hubert; 2, Brenda Oakley; 3, R. Newman; 4, S. Cowell.  
Class C: 1, M. West; 2, Fran Rogers; 3, May Netherell; 4, G. Liddle.  
Class Ca: 1 and 2, R. Cory; 3, A. Thacker; 4, D. Ingle.  
Class Cb: 1, P. Coyne; 2 and 4, P. Coyne; 3, J. Stollery.  
Class D: 1 and 2, May Netherell; 3, R. F. Thoday; 4, S. Cowell.  
Class Db: 1 and 3, C. Enright; 2, S. Cowell; 4, C. Kittingbury.  
Class E: 1, A. Chandler; 2, T. Woolley; 3, K. Adams; 4, A. P. Taylor.  
Class Ea: 1, A. Thacker; 2 and 3, A. P. Taylor; 4, J. Bartlett.  
Class Eb: 1, R. F. Thoday; 2, Fran Rogers; 3, A. P. Taylor; 4, P. Elson.  
Class F: 1, C. & K. Thomas; 2, J. Myrtle; 3, P. Jarvis; 4, R. A. Orr.  
Class G: 1, May Netherell; 2, Mr. and Mrs. A. E. Sharp; 3, W. P. Sutton; 4, A. Halsey.  
Class H: 1, P. Cottle; 2, M. Murray; 3, Fran Rogers; 4, May Netherell.  
Class I: 1, C. Kittingbury; 2, W. Mason; 3, J. Stollery; 4, P. Coyne.  
Class K: 1, 2 and 4, J. Connolly; 3, D. Winder.  
Class L: 1, M. West; 2, W. P. Sutton; 3, A. P. Taylor; 4, A. I. Feast.  
Class M: 1, Sybil Hedger; 2, G. Liddle; 3, R. F. Thoday; 4, B. Peacock.  
Class N: 1, A. MacDonald; 2 and 3, P. Coyne; 4, R. F. Thoday.  
Class No-t: 1 and 3, K. Usher; 2, P. Cottle; 4, G. Smith.  
Class O: 1, A. P. Taylor; 2, C. Kittingbury; 3, A. E. Norman; 4, K. E. Cocker.  
Class P: 1, Miss C. Hodgson; 2, 3 and 4, A. E. Neenha.  
Class Q: 1, K. Usher; 2, A. P. Taylor; 3, Mrs. V. A. Feast; 4, B. Meech.  
Class R: 1, G. Smith; 2, M. Murphy; 3, R. F. Thoday; 4, D. Oakley.  
Class S: 1 and 3, May Netherell; 2, C. Kittingbury; 4, J. London.  
Class T: 1 and 3, K. Usher; 2, R. Newman; 4, P. Cottle.  
Class U: 1 and 2, Sybil Hedger; 3, P. Pinder; 4, Mr. and Mrs. B. Fry.  
Class V: 1 and 2, D. Stokes; 3, V. Hunt; 4, P. Pinder.  
Class W: 1, D. Stokes; 2, E. Binstead; 3, Pat Williams; 4, G. Owen.  
Class Xb-m: 1, Mrs. Hubert; 2 and 3, A. MacDonald; 4, A. Cook.  
Class Xa-t: 1, G. Smith; 2, Fran Rogers; 3, Mr. and Mrs. B. Fry; 4, K. Usher.  
Class Z: 1, G. Smith; 2, A. Bullock; 3, A. Chandler;

4, D. Dare. Class B-Ty: 1, G. Mason; 2, Jane Usher; 3, Rhonda Coyle; 4, D. Elson.

**RESULTS of the Buxton and District A.S.** open show were as follows: Best Fish in Show: Mr. and Mrs. Gabe (S.S. Alliance). Guppies: 1 and 2, Mrs. Houghton (Sandgrounders); 3, M. Clarke (Buxton). Mollies: 1, P. Armstrong (Heywood); 2, D. Hough (Huddersfield); 3, K. Houghton (Sandgrounders). Platies: 1, B. W. Carter (Merseyside); 2, W. Bamber (Sandgrounders); 3, P. Armstrong (Heywood). Swordtails: 1, S. Heaton (Sandgrounders); 2, Mr. and Mrs. Stephenson (Sherwood); 3, Mr. and Mrs. Burton (Blackburn). Livebearer class: 1, B. W. Carter (Merseyside). Small Gouramis: 1, P. and H. Batchelor (Loyne); 2, B. Guver (Heywood); 3, G. Wilkinson (Hyde). Section 6: 1, R. I. Payne (Merseyside); 2, Mr. and Mrs. Burton (Blackburn); 3, Mr. Betsony (Blackburn). A.O.V. Anabantid: 1, Mr. Norton (Sandgrounders); 2, Mr. and Mrs. Blades (Cresswell); 3, P. S. Godgeon (Hyde). Mr. Norton (Sandgrounders) Class winner. Characins (Small): 1, Mr. and Mrs. Marshalla (Blackburn); 2, Mr. Houghton (Sandgrounders); 3, P. J. Whelan (Blackburn). Characins (Large): 1, Mr. and Mrs. B. Bailey (Sherwood); 2, P. J. Whelan (Blackburn); 3, Mr. Houghton (Sandgrounders); Mr. and Mrs. Bailey (Sherwood) Class winner. A.O.V. Tropical: 1, Mr. and Mrs. Gabe (J.J. Alliance); 2 and 3, Mr. and Mrs. G. Bond (Sandgrounders) Class winners: Mr. and Mrs. Gabe. Corydoras: 1, M. Clarke (Buxton); 2, D. Buckley (Heywood); 3, Mr. and Mrs. Muckle (Sandgrounders). Loaches and Bettas: 1, Mr. Norton (Sandgrounders); 2, Mr. and Mrs. Marshalla (Blackburn); 3, A. Carr (Independent). A.O.V. Catfish: 1, P. and H. Batchelor (Loyne); 2, Mr. and Mrs. G. Bond (Sandgrounders); 3, Mr. and Mrs. Peckin (Macclesfield). Class winners: P. and H. Batchelor. Angels: 1 and 3, A. Axon (Ashton-under-Lyne); 2, Mr. and Mrs. B. Bailey (Sherwood). Dwarf: 1, B. W. Carter (Merseyside); 2, S. Gallane (Buxton); 3, Mr. Norton (Sandgrounders). A.O.V. Cichlid: 1, Mr. and Mrs. Gabe (J.J. Alliance); 2, Mr. and Mrs. Gilding (Retford); 3, D. Buckley (Heywood). Class winners: Mr. and Mrs. Gabe. Breeders and Teams (Egg-layers): 1-10: 1, P. Armstrong (Heywood); 2 and 3, P. Vassiere (Merseyside). Egg-layers: 11-20: 1, P. Vassiere (Merseyside); 2, R. I. Payne (Merseyside); 3, Mr. and Mrs. Gilding (Retford). Livebearers: 1, Mr. and Mrs. G. Bond (Sandgrounders); 2, D. Valentine (Northwick); 3, S. Hooton (Sandgrounders). Class winner: P. Vassiere. Barbys (Small): 1, Mr. and Mrs. Bull (Derby); 2, Mr. and Mrs. Blades (Cresswell); 3, Mrs. V. Hough (Huddersfield). Barbys (Large): 1, T. Nickleson (Sherwood); 2, Mr. and Mrs. Bull (Derby); 3, Mr. and Mrs. G. Bond (Sandgrounders). Class winners: Mr. and Mrs. Bull. A.V. Killie: 1, Mr. and Mrs. Marshalla (Blackburn); 2, J. W. Ridley (Heywood); 3, R. I. Payne (Merseyside). Class winners: Mr. and Mrs. Marshalla. Sharks, Labros and Foxes: 1, Miss J. Gullane (Buxton); 2, H. Buckley (Northwick); 3, Mr. and Mrs. G. Bond (Sandgrounders). Rasboras, Danios and Minnows: 1, P. J. Whelan (Blackburn); 2, W. Bamber (Sandgrounders); 3, Mr. Green (Castledon). Class winner: Miss J. Gullane. Pairs (Egg-layers): 1, Mr. and Mrs. Gilding (Retford); 2, Mr. and Mrs. Muckle (Sandgrounders); 3, R. A. Johnston (Hyde). Section 25: 1, R. I. Payne (Merseyside); 2, Mr. Norton (Sandgrounders); 3, P. S. Godgeon (Hyde). Class winners: Mr. and Mrs. Gilding. Common Goldfish: 1, Mr. and Mrs. Bull (Derby); 2, D. Valentine (Northwick); 3, Miss M. Burton (Blackburn). Fancy Goldfish: 1 and 3, H. Carr; 2, Mrs. D. Valentine (Northwick). A.O.V. Coldwater: 1, Mr. and Mrs. Blades (Cresswell); 2, M. and D. Valentine (Northwick); 3, H. Carr; Class winners: Mr. and Mrs. Bull. Novice: 1, G. Evans (Sandgrounders); 2, P. Squire (Wythenshaw); 3, Mr. and Mrs. Thomas (Wythenshaw). Class winner: G. Evans. Marine: 1, J. Igoe (Sherwood); 2, K. Jones (Heywood); 3, P. Squire (Wythenshaw). Class winner: J. Igoe. Society with the most points: Sandgrounders. The number of entries was 557.

AT the September meeting, the Lincoln and District A.S. held their annual competition for the Richard Baines trophy. This was judged by Mr. J. Bower of the Sherwood Society and winners were: 1, J. Goldson; 2, Master Senior; 3, Mr. Towse; 4, Mrs. Woodliffe.

**OPEN Show results of the Torbay A.S.** were as follows: Barbys: 1 and 2, A. D. S. Kirby (Plymouth); 3, M. T. Bishop (Bishops Cleeve); 4, T. Cripps (Basingstoke). Characins: 1, T. L. Woolley (Torquay); 2, Mrs. May Netherell (Riverside); 3, M. Poole (Torquay); 4, A. D. S. Kirby (Plymouth). Hypessobrycon Hemigrammus and Cheridon: 1 and 4, C. Turner (Cardiff); 2, H. Chick (Llanwit Major); 3, J. Davis (Torquay). Cichlids: 1, D. Riste (Cardiff and District); 2, C. Lipscombe (Ilfracombe); 3, T. Woolley (Torbay); 4, Mrs. J. Griffiths (Torbay). Angels: 1, T. Taylor (Basingstoke); 2, P. Orsman (Torquay); 3, W. Morrell (Torquay); 4, P. Hammett (Torquay). Dwarf Cichlids: 1, D. R. Warmant (Cardiff); 2 and 4, J. Beag (Torquay); 3, T. Taylor (Basingstoke). Labryrinths: 1, T. Cripps (Basingstoke); 2, T. Woolley (Torbay); 3, Miss A. Corner (Torbay); 4, Mrs. J. Griffiths (Torbay). Siamese Fighters: 1, D. Hole (Basingstoke); 2 and 3, T. Cripps (Basingstoke); 4, J. A. Wood (Plymouth). Egg-laying Toothcarp: 1 and 2, R. J. Smith (Plymouth); 3, J. Denning (Torquay); 4, P. Orsman (Torquay). Tropical Catfish: 1, D. Lambourne (Rochampton); 2, Mr. and Mrs. Medway (Weymouth); 3, C. Turner (Cardiff); 4, M. Poole (Torbay). Corydoras and Brochis: 1, Mrs. May Netherell (Riverside); 2 and 3, A. D. S. Kirby (Plymouth); 4, M. Poole (Torbay). Rasboras: 1 and 3, J. A. Wood (Plymouth); 2, Mr. and Mrs. Medway (Weymouth); 4, M. Poole (Torbay). Danios and W.C.M.M.: 1, W. Horwell; 2 and 3, J. J. Edwards (Llanwit Major); 4, D. Earnshaw (Taunton). Loaches: 1, A. Bligh (Ilfracombe); 2, D. Riste (Cardiff); 3, C. Saunders; 4, C. Turner (Cardiff). A.O.S. Tropical Egg-layers: 1, H. Chick (Llanwit Major); 2, M. R. Leeder (Plymouth); 3, Mrs. May Netherell (Riverside); 4, J. J. Edwards (Llanwit Major). Seated Pairs: 1, J. Poole (Torbay); 2, M. Poole (Torbay); 3, Mrs. J. J. Edwards (Llanwit Major); 4, A. D. S. Kirby (Plymouth). Guppies (Male): 1, 3 and 4, W. G. Reid (Plymouth); 2, W. P. M. Crick (Plymouth). Guppies (Female): 1, Master J. Edwards (Llanwit Major); 2 and 3, T. L. Woolley (Torbay); 4, Mrs. Clare Rossi (Bishops Cleeve). Swordtails: 1 and 4, F. Cox (Torbay); 2, P. Rossi (Bishops Cleeve); 3, E. Short (Torbay). Platies: 1 and 3, Mrs. J. Bishop (Bishops Cleeve); 2, T. L. Woolley (Torbay); 4, D. R. Warmant (Cardiff). Mollies: 1 and 4, W. T. J. Crockett (Petersfield and District); 2, T. Taylor (Basingstoke); 3, Mrs. May Netherell (Riverside). A.O.S. Livebearers: 1, J. Cripps (Basingstoke); 2, C. Turner (Cardiff); 3, T. Woolley (Torbay); 4, J. R. Davis (Torbay). Single Tail Goldfish: 1, S. Lloyd (Bristol); 2, Mrs. Clare Rossi (Bishops Cleeve); 3 and 4, J. C. Webber (Plymouth). Shubunkins—London and Bristol G.S.G.H. Singletails: 1, B. Speare (Bude); 2, R. King (Torbay); 3, G. J. Bell (Bristol); 4, Mrs. J. Griffiths (Torbay). Twin Tail Goldfish: 1, S. Lloyd (Bristol); 2, Mrs. J. Griffiths (Torbay); 3, J. Webber (Plymouth); 4, B. Speare (Bude). A.O.S. Coldwater: 1, G. Thompson (Torbay); 2, N. Matthews (Torbay); 3, Master D. Mayor (Torbay); 4, T. L. Woolley (Torbay). Higos, Leather and Mirror Carps, Golden Tench, Orfe and Rudd: 1, Mrs. C. F. Scriven (Bishops Cleeve); 2 and 3,

**PREVENTS**  
  
**ALGAE**  
**Hillside Aquatics London N12**



G. Thompson (Torbay); 4, J. C. Webber (Plymouth). Breeders (Tropical Egglayers): 1 and 4, M. Poole (Torbay); 2, M. Leeder (Plymouth); 3, J. Wright (Chard). Breeders (Tropical Livebearers): 1 and 2, C. Turner (Cardiff); 3, T. Woolley (Torbay); 4, M. Leeder (Plymouth). Breeders (Coldwater): 1, T. L. Woolley (Torbay); 2, 3 and 4, R. King (Torbay). Tropical Marines: 1, T. Taylor (Basingstoke); 2, T. Cripps (Basingstoke); 3, M. T. Bishop (Bishops Cleeve); 4, Mrs. L. Doubleday (B.M.A.A.). Native Marines: 1, L. Wilkins (B.M.A.A.); 3, A. Carroll (B.M.A.A.). Plants: 1 and 4, W. M. J. Matthews (Torbay); 2, Comp. 76 (72); 3, T. Woolley (Torbay). Best Fish in Show: T. Taylor; F.B.A.S. Trophy: T. Taylor; Best Coldwater: G. Thompson; Best Livebearer: Mrs. J. Bishop; Best Junior: Master J. Edwards; President's Own Choice in Show: W. F. J. Croxford; Best Shark: H. Chick.

THE first Bi-annual show of the Killingworth Aquarist Association was well attended for a new club. The Association Club gave their support. The fish were judged by G. Hunt and C. Knight, both F.B.A.S. Judges. A talk was given by F. Askew of South Shields Club on Killifish. He is a member of the Durham B.C.A. and brought some killies along to show the club, and also some slides.

Results: A.O.V. Livebearers: 1 and 2, R. Kerr; 3, Mr. and Mrs. Renton. Coldwater: 1, Mr. and Mrs. Sparham; 2 and 3, P. Quill. Pairs: 1, Mr. and Mrs. Hickman; 2, Mr. and Mrs. Renton. Breeders: 1, Mr. and Mrs. Hickman; 2 and 3, Mr. and Mrs. Renton. Rabbits: 1, Mr. and Mrs. Sparham; 2, Mrs. D. Armitage. Furnished Jars: 1, Mr. and Mrs. Hickman. Catfish: 1, R. Kerr; 2, S. Daglish; 3, Mr. and Mrs. Hickman. Loach: 1, Mr. and Mrs. Renton. E.L.T.C.: 1, Mr. and Mrs. Renton; 2, Mr. and Mrs. Hickman. A.O.V. Tropical: 1 and 2, Mr. and Mrs. Renton. Corydoras: 1, S. Fellows; 2, Mr. and Mrs. Hickman. Labco: 1 and 2, Mr. and Mrs. Hickman. Characins: 1, Mr. and Mrs. Sparham; 2, S. Daglish; 3, S. Fellows. Cichlids: 1, Mr. and Mrs. Hickman; 2, R. Kerr; 3, J. Askell. Barbs: 1, Mr. and Mrs. D. Armitage. Labyrinth: 1, S. Fellows; 2, Mr. and Mrs. Hickman; 3, Mr. and Mrs. Sparham. The Best Fish in Show trophy was won by Mr. and Mrs. Hickman, as also was the Killingworth Ten Trophy. The Novice Trophy went to R. Kerr and the George Hunt Kribensis Competition Trophy was won by Mr. and Mrs. Renton.

OVER 470 tropical and coldwater fish were entered in the 31 classes at this year's successful Bournemouth and District A.S. open show. The majority of entries were in the tropical classes and the coldwater classes, although well supported, did not have as many large size fish as in past years. It was also disappointing to note how few of the native fish had been entered. The class for Aquascapes made a very interesting show and roused quite a lot of enthusiastic comment. This was the first time that a class for this very interesting and artistic some had been included in the H.D.A.S. Open Show. The "Best Fish in Show" trophy was won by Mrs. S. Parish of Twickenham.

List of awards: AK: 1, P. Cairns; 2, D. Parrot; 3, J. Sheppard; 4, R. Hart. BA: 1, W. Mason; 2, H. Pratt; 3, J. Myrtle; 4, G. Collins. BZ: 1 and 4, B. Bisson; 2, Mrs. Cruickshank; 3, J. Bailey. CA: 1, R. Cox; 2, Miss Coyle; 3, R. Pook; 4, C. Kinsbury. CZ: 1, A. P. Taylor; 2 and 4,

L. G. Brazier; 3, R. Pook. DA: 1, K. Huber; 2, R. Hart; 3, T. Marsh. DB: 1, 2 and 3, B. Bisson; 4, M. Alexander. DZ: 1, T. Bollingbrook; 2, R. F. Thody; 3, P. Gillet; 4, D. Reilly. EA: 1, Mrs. M. Pratt; 2 and 3, A. P. Taylor; 4, J. Bailey. EZ: 1, Mrs. S. Parish; 2, A. P. Taylor; 3, L. G. Brazier; 4, C. Fisher. FGDB: 1 and 3, P. Roberts; 2, D. Reilly; 4, M. Collins. FZ: 1, D. Reilly; 2, R. Grosvenor; 3, M. Collins; 4, J. Myrtle. G: 1, T. Cruickshank; 2, M. Crew; 3, H. Nicholls; 4, P. Gillet. H: 1, I. Fraser; 2, Mrs. Murphy; 3, J. Bailey; 4, Miss Howell. J: 1 and 3, I. Clarke; 2, C. Kinsbury; 4, R. Pook. K: 1, T. Fraser; 2, E. Sheppard; 3, R. F. Hale; 4, Miss Garrad. L: 1, A. I. Feast; 2, T. Coyle; 3, K. Usher; 4, Mrs. R. Brewer. M: 1, I. Clarke; 2, K. Parker; 3, R. F. Thody; 4, L. G. Brazier. NBT: 1 and 3, K. Usher; 2, R. Pook; 4, T. Fraser. O: 1, A. P. Taylor; 2, C. Kinsbury; 3, K. F. Hale; 4, D. Reilly. P: 1 and 4, A. E. Noronha; 2, P. Grosvenor; 3, J. Bailey. Q: 1, K. Usher; 2, R. Roche; 3, P. Grosvenor; 4, Mr. Honey. R: 1, Mr. and Mrs. Newbury; 2 and 3, W. Mason; 4, H. Nicholl. S: 1 and 2, A. Lynn; 3, L. G. Little; 4, D. Reilly. T: 1, B. Bisson; 2, T. Fraser; 3, Mrs. Cruickshank; 4, K. Usher. UAB: 1, M. Crew; 2 and 3, F. Pinder; 4, A. J. Crew. UCD: 1 and 2, Mrs. Longstaff; 3 and 4, E. Binstead. V: 1, 2 and 3, Miss B. Baker; 4, Mrs. Longstaff. W: 1, I. Binstead; 2, B. Lough; 3, J. Sheppard; 4, A. I. Feast. XBM: 1, Mr. and Mrs. Newbury; 2 and 3, D. Brookes; 4, R. Roberts. XOT: 1 and 3, K. Usher; 2, A. E. Noronha; 4, G. L. Little. Specialist Class: 1 and 2, B. Bisson; 3, M. Collins; 4, L. G. Brazier.

THE results of the 9th Annual Show by Trowbridge & District A. and P.S. are as follows: A: 1, Scudamore; 2, M. Scriven. Bb: 1, C. Russell; 2, R. Lawrence. B: 1, D. Noble; 2, J. Jackson. Ca: 1, R. Toone; 2, A. Harvey. C: 1, C. Turner; 2, D. Phippen. D: 1, A. Whalley; 2, Mr. Labbett. Db: 1, F. Gibbs; 2, D. Warment. D: 1, D. Noble; 2, R. Lawrence. Ea: 1, P. Brooks; 2, C. Turner. E: 1, B. Snell; 2, R. Lawrence. F: 1 and 2, R. Toone. G: 1, D. Noble; 2, D. Phippen. H: 1, R. Dodson; 2, R. Dodson. J: 1, D. Noble; 2, F. Grant. K: 1, D. Phippen. M: 1, G. Castle; 2, R. Dodson. N: 1, C. Turner; 2, S. Daniels. O: 1, S. Castle; 2, C. Whittaker. P: 1, R. Wigg; 2, G. Ball. Q: 1, R. Lawrence; 2, R. Poots. R: 1 and 2, L. Littleton. S: 1, A. Cripps; 2, R. Poots. Sa: 1, T. Taylor; 2, T. O'Neil. Xa: 1, C. Russell; 2, D. Warment. X: 1 and 2, C. Turner. U: 1, C. Pearce; 2, S. Daniels. Ua: 1, L. Memmott; 2, J. Bull. Wv: 1 and 2, R. Rice. W: 1, R. Lawrence; 2, D. Phippen. Best in Show: Class U: Common Goldfish, C. Pearce.

WINNERS at the successful Hastings and St. Leonards A.S. open show were: Class NBN: 1, 3 and 4, Mr. Saunders (Tonbridge); 2, Mr. Kinsbury (Uxbridge). Class NOY: 1, Mr. Cottle (Gravesend); 2, Mr. Noronha (North Kent); 3, Mr. Brent (Freelance). Class O: 1, Mr. Kinsbury (Uxbridge); 2 and 3, Mr. Fry (Erith); 4, Mr. Hale (Medway). Class P: 1, Mr. Kinsbury (Uxbridge); 2 and 3, Mr. Neonha (North Kent); 4, Mr. Tester (Burgess Hill). Class Q: 1, Mr. Nichols (Maidstone); 2, Mr. Feast (Oxod); 3, Mr. Knight (Gosport); 4, Mr. Newman (Sittingbourne). Class R: 1, Mr. Woodhams (Sevenoaks); 2, Mr. Nichols (Maidstone); 3, Mr. Fry (Erith); 4, Mr. Kinsbury (Uxbridge). Class S: 1, Mr. Kinsbury (Uxbridge); 2, Mr. Nichols (Maidstone); 3, Mr. Adams (Freelance); 4, Mr. Knight (Gosport). Class A: 1, Mr. Cottle (Gravesend); 2 and 3, Mr. London; 4, Mr. Woodward. Class XBM: 1 and 3, Mr. Adams (Freelance); 2, Mr. Feek (Brighton); Class XOT: 1, Mr. Fry (Erith); 2, Mr. Cottle (Gravesend); 3, Mr. Noronha (North Kent); 4, Mr. Newman (Sittingbourne). Class Z: 1, Mr. Smith (Stannell); 2 and 3, Mr. Woodward (North Kent); 4, Mrs. Saunders (Tonbridge). Class C: 1, Mr. Knight (Gosport); 2, Mr. Kinsbury (Uxbridge); 3, Mr. Martin (Hastings); 4, Mr. Robinson (North Kent).

Class CB: 1, 2, 3 and 4, Mr. Cottle (Gravesend). Class CA: 1, Mr. Feast (North Kent); 2, Mr. Stevens (Brighton); 3, Mr. Sayers (Brighton); 4, Mrs. Morris (North Kent). Class E: 1, Mr. Fry (Medway); 2, Mr. Sayers (Brighton); 3 and 4, Mr. Billingham (Tonbridge). Class BA: 1, Mr. Smith (Stannell); 2, Mr. Kinsbury (Uxbridge); 3 and 4, Mr. London (Tonbridge). Class D: 1 and 2, Mr. Rees (Gosport); 3, Mr. Sayers (Brighton); 4, Mr. Feek (Brighton). Class DB: 1, Mr. Feek (Brighton); 2 and 3, Mr. Kinsbury (Uxbridge). Class EA: 1, Mr. Knight (Gosport); 2, Mr. Rees (Gosport); 3, Mr. Baker (Tonbridge). Class E: 1, Mr. Newman (Sittingbourne); 2 and 4, Mrs. Pannell (Hastings); 3, Mr. Adams (Freelance). Class F: 1, Mr. Tester (Burgess Hill); 2, Mr. Cottle (Gravesend). Class G: 1 and 4, Mr. Baker (Tonbridge); 2, Mr. London (Tonbridge); 3, Mrs. Pannell (Hastings). Class H: Mr. Cottle (Gravesend); 2, Mr. Adams (Freelance); 3, Mr. Waddell (Hastings); 4, Mr. Knight (Gosport). Class J: 1, Mr. Rees (Gosport); 2, Mr. Nichols (Maidstone); 3, Mr. Kinsbury (Uxbridge). Class K: Mr. Billingham (Tonbridge); 2, Mr. Nichols (Maidstone); 3, Mr. Adams (Freelance); 4, Mr. Fry (Erith). Class L: 1, Mr. Feek (Brighton); 2 and 4, Mr. Fry (Erith); 3, Mr. Nichols (Maidstone). Class M: 1, Mr. Purcher (Tonbridge); 2, Mr. London (Tonbridge); 3, Mr. Kinsbury (Uxbridge); 4, Mr. Nichols (Maidstone).

OPEN show results of the Accrington A.S. were:—Best Fish in Show: Mr. T. Hindley (Worsley). Guppies: 1 and 2, D. and M. Laycock (Sheaf Valley); 3, Mr. Blades (F.G.A. Manchester). Platies: 1, T. Hindley (Worsley); 2, Mr. and Mrs. Emmerson (Castleford); 3, D. and M. Laycock (Sheaf Valley). Swordtails: 1, P. Whelan (Blackburn); 2, C. Norton (Sandgrounders); 3, D. and M. Laycock (Sheaf Valley). Mollies: 1, D. Buckley (Haywood); 2, P. Whelan (Blackburn); 3, A. Atherton (Grimwood). A.O.V. Livebearers: 1, T. Tasker (Sandgrounders); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, D. A. Wilkinson (Fleetwood). Characins (up to 3 in.): 1, P. Whelan (Blackburn); 2, G. and A. Johnson (Hyde); 3, G. Waterhouse (Sandgrounders). Characins (over 3 in.): 1 and 3, Miss S. Clarke (Aireborough); 2, P. Whelan (Blackburn). Cichlids (up to 3 in.): 1, Mr. and Mrs. Marshall (Blackburn); 2, Master J. Emmerson (Castleford); 3, I. Hopkins (Warrington). Cichlids (over 3 in.): 1, P. Whelan (Blackburn); 2, Mr. and Mrs. Rigby (Worsley); 3, G. Wilkinson (Hyde). Angels: 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, Mr. Axon (Ashton-U-Lyne); 3, S. Harvey (Merseyside). Barbs (up to 3 in.): 1, D. Buckley (Haywood); 2, B. Bamber (Sandgrounders); 3, L. Mynard (Osram). Barbs (over 3 in.): 1, A. Vaisiere (Merseyside); 2, Mr. Higham (Warrington); 3, F. Mulla (Merseyside). Aphyosemon: 1, P. Whelan (Blackburn); 2, C. Whitley (Accrington); 3, F. Chaburn (Haywood). Rivulids: 1, M. Wood (Huddersfield); 2, C. Whitley (Accrington); 3, P. Whelan (Blackburn). Egg-layer: Toothcarp A.O.V.: 1, T. Hindley (Worsley); 2, A. Eames (Valley); 3, P. Chaburn (Haywood). Carps and Minnows: 1, R. Bamber (Sandgrounders); 2, S. Guiver (Haywood); 3, G. Bond (Sandgrounders). Labcos, Sharks and Flying Foxes: 1 and 2, T. Hampton (Merseyside); 3, D. Grogan (Accrington). Danios: 1, Mr. Mellor (Blackburn); 2, R. Atherton (Grimwood); 3, D. A. Wilkinson (Fleetwood). Rasboras: 1, T. Hampton (Merseyside); 2, A. Jenkins (Merseyside); 3, P. Whelan (Blackburn). Fighters: 1, T. Hallor (F.G.A.); 2, G. Kershaw (Haywood); 3, D. and M. Laycock (Sheaf Valley). Anabantids (up to 3 in.): 1, Miss S. Clarke (Aireborough); 2, B. Wilson (Merseyside); 3, Mr. and Mrs. Emmerson (Castleford). Anabantids (over 3 in.): 1, J. Boothman (Accrington); 2, Mrs. Longmate (Farnworth); 3, C. Norton (Sandgrounders). Pairs (Livebearers): 1, P. Armstrong (Haywood); 2, G. Harvey (Merseyside); 3, D. Buckley (Haywood). Pairs (Egg-layer): 1, A. Vaisiere (Merseyside); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, G. Waterhouse (Sandgrounders). Breeders (Livebearers): 1, D. Buckley (Haywood); 2, Mr. and Mrs. Marshall (Blackburn); 3, D. Buckley

White Spot vanishes when you use **halamid** Hillside Aquatics London N12

(Heywood). Breeders (Egglayers (A)): 1, P. Armstrong (Heywood); 2, K. Wright (Sandgrounders); 3, A. Vaisiere (Merseyside). Breeders (Egglayers (B)): 1, A. Vaisiere (Merseyside); 2, P. Armstrong (Heywood); 3, P. Myerscough (Accrington). Catfish and Loach (up to 3 in.): 1, P. and H. Batchelor (Loyne); 2, H. A. Heap (Blackborough); 3, D. A. Wilkinson (Fleetwood). Catfish and Loach (over 3 in.): 1, P. Whelan (Blackburn); 2, D. A. Wilkinson (Fleetwood); 3, G. Wilkinson (Hyde). A.O.V. Tropical: 1, P. and H. Batchelor (Loyne); 2, R. Atherton (Grimwood); 3, G. Haworth (Accrington). A.V. Marine Fish: 1 and 3, W. Stuart (Aireborough); 2, P. Armstrong (Heywood). Juniors A.V.: 1 and 3, Master A. Hinchey (Loyne); 2, Miss J. Gurvey (Heywood). Ladies A.V.: 1, Mrs. G. Bond (Sandgrounders); 2, Mrs. K. Grimes (Accrington); 3, Mrs. V. Brown (Accrington). Furnished Mini-jars: 1, Mrs. Ham (Lytham); 2, M. Wild (Accrington); 3, W. Stuart (Aireborough). Common Goldfish and Comets: 1, Mr. Wolstenholme (Blackburn); 2, Miss S. Clarke (Aireborough); 3, C. Whitley (Accrington). Moors: 1 and 3, C. Whitley (Accrington); 2, M. Wild (Accrington). Vestials: 1, Miss S. Clarke (Aireborough). Shubunkins: 1, F. Foote (Accrington); 2, S. Walsh (Accrington); 3, Master S. Foote (Accrington). Koi Carp: 1, 2 and 3, C. Whitley (Accrington). Fanails: 1, Miss S. Clarke (Aireborough); 2, S. Walsh (Accrington); 3, S. Foote (Accrington). Orandas: 1 and 2, C. Whitley (Accrington). Lionheads: 1 and 2, S. Walsh (Accrington); 3, Miss S. Clarke (Aireborough). Any Species Coldwater: 1 and 2, S. Walsh (Accrington); 3, C. Whitley (Accrington). A.V. Fancy: 1, Miss S. Clarke (Aireborough); 2, Master N. Holden (Accrington).

**MEMBERS** elected at the annual general meeting of the **Dorchester and District A.S.** were as follows: chairman, H. Coenick; vice-chairman, R. Christopher; secretary, Mrs. B. Jeffries; treasurer, Mrs. L. Neuman; show secretary, Mrs. J. Matthews; committee members, P. Connors, N. Matthews, Mrs. W. Voss, G. Belt, Mrs. M. Fox.

P. Mardon, who has supported the club since it was first formed, has decided to withdraw from his office as president. The club also regrets the loss of vice-chairman A. Billington, who, after many years with the club has decided to move to London with his family. The results of the table show are as follows: Section 1.—Barbs: 1 and 3, R. W. Taylor; 2, G. Fitzgerald. Loaches and Botias: 1 and 2, R. Christopher. Pairs: 1 and 2, R. Christopher; 3, R. W. Taylor. Section 2.—Barbs: 1, G. M. Fox; 2, Mrs. M. E. Fox; 3, Mrs. K. Mitchell. Loaches and Botias: 1, Mrs. M. E. Fox. Pairs: 1 and 2, Mrs. M. E. Fox; 3, Master A. Fox.

The club meetings are held on the second Thursday of each month at the Youth Centre, York Road, and any new members would be most welcome.

**AN inter-society competition between Dunlop Aquarium Keepers Society, Merseyside A.S. and Hoylake and District A.S. resulted in a win for the Dunlop Society. Results were as follows:—Guppies: 1, T. Hampton (D.A.K.S.); 2 and 3, B. Carter (M.A.S.). Platies: 1, G. Harvey (M.A.S.); 2 and 3, B. Carter (M.A.S.). Swordtails: 1, D. Harvey (M.A.S.); 2, A. Jenkinson (M.A.S.); 3, T. Clays (D.A.K.S.). Mollies: 1, A. Davies (D.A.K.S.); 2, B. Carter (M.A.S.); 3, A. Turner (D.A.K.S.). Large Anabantids: 1, S. Smith (D.A.K.S.); 2 and 3, S. Seymour (M.A.S.). Small Anabantids: 1, T. Hampton (D.A.K.S.); 2, B. Wilson (M.A.S.); 3, P. Skillen (H. & D.A.S.). Siamese Fighters: 1, J. Taylor (M.A.S.); 2, B. Carter (M.A.S.); 3, H. Rowland (H. & D.A.S.). Large Cichlids: 1 and 2, A. Roche (D.A.K.S.); 3, J. Taylor (M.A.S.). Small Cichlids: 1, T. Hampton (D.A.K.S.); 2, B. Carter (M.A.S.); 3, A. Jenkinson (M.A.S.). Angels: 1, R. Armstrong (D.A.K.S.); 2, S. Harvey (M.A.S.); 3, R. Cormack (D.A.K.S.). Large Characins: 1, S. Seymour (M.A.S.). Small Characins: 1, B. Wilson (M.A.S.); 2, J. Taylor (M.A.S.); 3, S. Smith (D.A.K.S.). Rasboras: 1 and 2, T. Hampton (D.A.K.S.); 3, A. Roche (D.A.K.S.).**

**Danos: 1, A. Davies (D.A.K.S.); 2, J. Taylor (M.A.S.); 3, B. Lilley (D.A.K.S.). Minnows: 1, E. Seymour (M.A.S.); 2, T. Griffiths (D.A.K.S.). Large Barbs: 1, A. Cooper (D.A.K.S.); 2 and 3, A. Turner (D.A.K.S.). Small Barbs: 1, T. Hampton (D.A.K.S.); 2, J. Taylor (M.A.S.); 3, T. Rowlands (D.A.K.S.). Killifish: 1 and 3, R. Payne (M.A.S.); 2, A. Jenkinson (M.A.S.). Small Catfish: 1 and 2, A. Roche (D.A.K.S.); 3, T. Hampton (D.A.K.S.). A.O.V. Catfish: 1, T. Clays (D.A.K.S.); 2, P. Skillen (H. & D.A.S.); 3, D. Morris (H. & D.A.S.). Loaches: 1, T. Hampton (D.A.K.S.); 2, A. Cooper (D.A.K.S.); 3, P. Skillen (H. & D.A.S.). Sharks: 1, T. Hampton (D.A.K.S.); 2, R. Armstrong (D.A.K.S.); 3, K. A. Sey (D.A.K.S.). Flying Foxes: 1, T. Hampton (D.A.K.S.); 2, A. Jenkinson (M.A.S.); 3, R. Armstrong (D.A.K.S.). A.O.V. Tropicals: 1, 2 and 3, T. Hampton (D.A.K.S.). Pairs (Egglayers): 1, M. Wilkinson (M.A.S.); 2, R. Payne (M.A.S.); 3, T. Hampton (D.A.K.S.). Pairs (Livebearers): 1, R. Payne (M.A.S.); 2, D. Harvey (M.A.S.); 3, G. Smith (D.A.K.S.). Ladies' Section: 1, Mrs. S. Clays (D.A.K.S.); 2 and 3, Mrs. Carroll (D.A.K.S.). Marines: 1 and 3, D. Shaw (D.A.K.S.); 2, R. Johnson (D.A.K.S.). Coldwater: 1, D. Harvey (M.A.S.); 2, B. Harvey (M.A.S.); 3, J. Taylor (M.A.S.). Decorated Jars: 1 and 2, S. Seymour (M.A.S.); 3, L. McCulloch (M.A.S.). Best Fish in Show: D. Shaw (marine section sea horse). Total points—Societies: Dunlop A.K.S., 934 points; Merseyside A.S., 74 points; Hoylake and District A.S., 9 points.**

**RESULTS of Workshop Aquarist and Zoological Society mini open show were as follows:—Swordtails: 1 and 2, Mr. Stevenson (Sherwood); 3, H. Thorpe (Doncaster). Guppies: 1, Mr. Stevenson (Sherwood); 2, Mr. and Mrs. Emerson (Castleford); 3, Mr. and Mrs. Brett (Retford). Mollies: 1, Mr. Stevenson (Sherwood); 2, Mr. Dudley (Hartlepool); 3, Mr. and Mrs. Emerson (Castleford). Platies: 1, P. Evans (Workshop); 2, Mr. Blundell (Doncaster); 3, Mr. Dudley (Hartlepool). Small Barbs: 1, D. Jones (Rotherham); 2, Mr. and Mrs. Feasey (Doncaster); 3, Misses C. and J. Sibson (Workshop). Large Barbs: 1 and 2, T. Nicholson (Sherwood); 3, Mr. and Mrs. Copley (Doncaster). Small Characins: 1, Mr. and Mrs. Clarke (Retford); 2, Mr. Downing (Sherwood); 3, Mr. and Mrs. Perkins (Workshop). Large Characins: 1, A. Frisby (Hull); 2, T. Hope (Hartlepool); 3, Mr. Stevenson (Sherwood). Dwarf Cichlids: 1, Mr. and Mrs. Clarke (Retford); 2 and 3, Mr. and Mrs. A. Binns (Scunthorpe). Large Cichlids: 1, Mr. and Mrs. Sellars (Lincoln); 2, T. Reid (Workshop); 3, T. Nicholson (Sherwood). Danios, Rasboras, Minnows: 1, Mr. Blundell (Doncaster); 2, Mr. and Mrs. Emerson (Castleford); 3, Mr. and Mrs. Clarke (Retford). Sharks and Foies: 1 and 3, Mr. Blundell (Doncaster); 2, Mr. and Mrs. Guy (Doncaster). Corydoras and Brochis: 1, Mr. and Mrs. Fletcher (Doncaster); 2 and 3, Mr. Blundell (Doncaster). A.O.V. Catfish: 1, D. Jones (Rotherham); 2, Mr. and Mrs. Fletcher (Doncaster); 3, G. White (Scunthorpe). A.V. Loach: 1, Mr. and Mrs. Caldwell (Scunthorpe); 2, Mr. and Mrs. Fletcher (Doncaster); 3, J. Emerson (Castleford). Fighters: 1 and 2, Mr. and Mrs. Sellars (Lincoln); 3, Mr. Dudley (Hartlepool). A.O.V. Anabantids: 1, Mr. and Mrs. E. Simpson (Workshop); 2, N. Jackson (Workshop); 3, Mr. and Mrs. Clarke (Retford). A.O.V. Tropical: 1, Mr. and Mrs. D. Caldwell (Scunthorpe); 2, Miss L. Reid (Workshop); 3, T. Reid (Workshop). Pairs Livebearers: 1, Mr. and Mrs. Feasey (Doncaster); 2, Mr. and Mrs. Simpson (Workshop); 3, Miss J. Cavell (Doncaster). Pairs Egglayers: 1, T. Reid (Workshop); 2, Misses C. and J. Sibson (Workshop); 3, Mr. Blundell (Doncaster). Best Fish in Show: Mr. and Mrs. Caldwell (Scunthorpe).**

**DURING August members of the Leamington and District A.S. were entertained with a slide show on Severanus, presented to C. Chamberlain, a society member. Also in August, at the second meeting the main firm was a cross-cross quiz. The secretary is Mrs. P. M. Stoodley,**

4 St. Johns Terrace, Tachbrook Street, Leamington Spa.

**EIGHTEEN societies benched 504 exhibits at the Barnsley A.S. tenth annual open show. The best fish in show trophy and Aquarist gold pin was won by Mr. and Mrs. D. Caldwell of Scunthorpe, with a loach. Results: Guppies: 1, Mr. and Mrs. D. Kirk (Castleford); 2, B. J. Brown (Bradford); 3, Mr. and Mrs. Stevenson (Sherwood). Platies: 1, M. Meardle-Kirk (Castleford); 2, W. Blundell (Doncaster); 3, D. M. Laycock (Sheaf Valley). Swordtails: 1, Mr. and Mrs. Stevenson (Sherwood); 2, Mr. and Mrs. Kirk (South Humberide); 3, Mr. and Mrs. L. King (Doncaster). Mollies: 1, J. Igoe (Sherwood); 2, Mr. Armstrong (Heywood); 3, Mr. Meardle-Kirk (Castleford). A.O.V. Livebearers: 1, D. P. Birdall (Aireborough). Section winner; 2, H. Thorpe (Doncaster); 3, Mr. and Mrs. Feasey (Doncaster). Small Characins: 1 and 2, D. M. Laycock (Sheaf Valley, Section winner); 3, Mr. and Mrs. Norton (South Humberide). A.O.V. Characins: 1, Mr. Short (Sheaf Valley); 2, Mr. and Mrs. Bradshaw (Sheaf Valley); 3, D. P. Birdall (Aireborough). Cichlids: 1, Mr. and Mrs. A. Binns (Scunthorpe and District); 2 and 3, Mr. Meardle-Kirk (Castleford). A.O.V. Cichlids: 1, T. E. Ingram (Section winner, Spec. A.Q. Society); 2, T. Nicholson (Sherwood); 3, Mr. Bryant (Independent). Angels: 1, Mr. and Mrs. Kilvington (Doncaster); 2, Mrs. M. Igoe (Sherwood); 3, Mr. and Mrs. Bailey (Sherwood). Barbs (Small): 1, Mr. and Mrs. Norton (South Humberide); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. and Mrs. D. Kirk (Castleford). A.O.V. Barbs: 1 and 3, T. Nicholson (Sherwood, Section winner); 2, Mr. and Mrs. Cohen (Pontefract). Corydoras: 1, E. Leadbeater (Fleetwood); 2, W. Blundell (Doncaster); 3, G. White (Scunthorpe). Loaches and Botias: 1, Mr. and Mrs. D. Caldwell (Scunthorpe, Section winner); 2, Mr. and Mrs. Guy (Doncaster); 3, Mr. and Mrs. King (Doncaster). A.O.V. Catfish: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. Hall (Aireborough); 3, K. Lancaster (Doncaster). S. Fighters: 1, D. M. Laycock (Sheaf Valley); 2 and 3, L. Smith (Castleford). A.O.V. Anabantids: 1, Mr. and Mrs. Kirk (South Humberide, Section winner); 2, Mr. and Mrs. Blades (Cresswell); 3, Mr. Meardle-Kirk (Castleford). Danio, Rasboa and Minnows: 1, Mrs. Wells (Doncaster); 2, Mr. Arkroyd (Aireborough); 3, E. Leadbeater (Fleetwood). Sharks and Flying Foxes: 1, W. Blundell (Doncaster, Section winner); 2, Mr. Meardle-Kirk (Castleford); 3, L. Hartley (Don Valley). Top Spawning Killifish: 1, T. Smith (Sheffield, Section winner); 2, Simpson and Mansfield (Barnsley); 3, Mr. and Mrs. Kirk (South Humberide). Bottom Spawning Killifish: 1, T. Smith (Sheffield); 2, Mr. and Mrs. Blades (Cresswell); 3, G. White (Scunthorpe). Breeders (Egglayers 1-10): 1, Mr. Armstrong (Haywood, Section winner); 2, Mr. and Mrs. Cohen (Pontefract); 3, Mr. and Mrs. Bradshaw (Sheaf Valley). Breeders (Egglayers 11-20): 1, Mrs. Wells (Doncaster); 2, Simpson-Horsfield (Barnsley); 3, Mr. and Mrs. Fletcher (Doncaster). Breeders (Live-Bearers 1-10): Mr. and Mrs. P. Walker (Sheaf Valley, Section winner); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, E. Leadbeater (Fleetwood). Breeders (Live-Bearers 11-20): 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, Mr. and Mrs. P. Walker (Sheaf Valley); 3, Mr. and Mrs. Kilvington (Doncaster). Pairs (Egglayers): 1, W. Blundell (Doncaster, Section winner); 2, Mr. and Mrs. Scott (Sheaf Valley); 3, Simpson-Horsfield (Barnsley). Pairs (Livebearers): 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs.**

**THE SAFE CURE FOR FUNGUS**  
  
**Hillside Aquatics London N12**

Kirk (South Humberstone); 3, B. Black (Fleetwood), A.O.V. Tropical; 1, Mr. Meardie-Kirk (Castleford, Section winner); 2, Mr. Green (Castleford); 3, G. Allen (South Humberstone). Common Goldfish: 1, E. Leadbeater (Fleetwood, Section winner); 2, A. Kaye (Huddersfield); 3, Miss S. Clark (Aireborough). Fancy Goldfish: 1, Miss S. Clark (Aireborough); 2, B. Black (Fleetwood); 3, I. and S. Toynne (Sheaf Valley), A.O.V. Goldwater; 1, Mr. and Mrs. Blades (Crawwell); 2, Mr. and Mrs. Smith (Sheffield). A.V. Junior: 1, Miss K. Feasey (Doncaster, Section winner); 2, A. Kaye (Huddersfield); 3, Miss I. Cavall (Doncaster). A. V. Marine: 1, J. Igoe (Sheffield, Section winner).

AT the August meeting of the **Accrington and District A.S.**, Mr. S. Walsh was elected show secretary due to the resignation of Mr. D. Grogan.

**THE Hastings and St. Leonards A.S.** open show winners were—Class NBN: 1, 3 and 4, Mr. Saunders (Tonbridge); 2, Mr. Kinslingbury (Uxbridge). Class NOT: 1, Mr. Cottle (Gravesend); 2, Mr. Noronha (N. Kent); 3, Mr. Beett (Freelance). Class O: 1, Mr. Kinslingbury (Uxbridge); 2 and 3, Mr. Fry (Erith); 4, Mr. Hale (Medway). Class P: 1, Mr. Kinslingbury (Uxbridge); 2 and 3, Mr. Noronha (N. Kent); 4, Mr. Tester (Burgess Hill). Class Q: 1, Mr. Nichols (Maidstone); 2, Mr. Feat (Oxley); 3, Mr. Knight (Gosport); 4, Mr. Newman (Sittingbourne). Class R: 1, Mr. Woodhams (Sevenoaks); 2, Mr. Nichols (Maidstone); 3, Mr. Fry (Erith); 4, Mr. Kinslingbury (Uxbridge); 2, Mr. Nichols (Maidstone); 3, Mr. Adams (Freelance); 4, Mr. Knight (Gosport). Class A: 1, Mr. Cottle (Gravesend); 2 and 3, Mr. London (Tonbridge); 4, Mr. Woodward (N. Kent). Class XBM: 1, 3 and 4, Mr. Adams (Freelance); 2, Mr. Feek (Brighton). Class XOT: 1, Mr. Fry (Erith); 2, Mr. Cottle (Gravesend); 3, Mr. Noronha (N. Kent); 4, Mr. Newman (Sittingbourne). Class Z: 1, Mr. Smith (Stannell); 2 and 3, Mr. Woodward (N. Kent); 4, Mrs. Saunders (Tonbridge). Class G: 1, Mr. Knight (Gosport); 2, Mr. Kinslingbury (Uxbridge); 3, Mr. Martin (Hastings); 4, Mr. Robinson (N. Kent). Class GB: 1, 2, 3 and 4, Mr. Cottle (Gravesend). Class CA: 1, Mr. Feat (N. Kent); 2, Mr. Stevens (Brighton); 3, Mr. Sayers (Brighton); 4, Mrs. Morris (N. Kent). Class B: 1, Mr. Fry (Erith); 2, Mr. Sayers (Brighton); 3 and 4, Mr. Birmingham (Tonbridge). Class BA: 1, Mr. Smith (Stannell); 2, Mr. Kinslingbury (Uxbridge); 3 and 4, Mr. London (Tonbridge). Class D: 1 and 2, Mr. Rees (Gosport); 3, Mr. Sayers (Brighton); 4, Mr. Feek (Brighton). Class DB: 1, Mr. Feek (Brighton); 2 and 3, Mr. Kinslingbury (Uxbridge). Class HA: 1, Mr. Knight (Gosport); 2, Mr. Rees (Gosport); 3, Mr. Baker (Tonbridge). Class E: 1, Mr. Newman (Sittingbourne); 2 and 4, Mrs. Pannell (Hastings); 3, T. Adams (Freelance). Class F: 1, Mr. Tester (Burgess Hill); 2, Mr. Cottle (Gravesend). Class G: 1 and 4, Mr. Baker (Tonbridge); 2, Mr. London (Tonbridge); 3, Mrs. Pannell (Hastings). Class H: 1, Mr. Cottle (Gravesend); 2, T. Adams (Freelance); 3, C. Waddell (Hastings); 4, Mr. Knight (Gosport). Class J: 1, Mr. Rees (Gosport); 2, Mr. Nichols (Maidstone); 3, Mr. Kinslingbury (Uxbridge). Class K: 1, Mrs. Bellingham (Tonbridge); 2, Mr. Nichols (Maidstone); 3, T. Adams (Freelance); 4, Mr. Fry (Erith). Class L: 1 and 4, Mr. Feek (Brighton); 2 and 3, Mr. Fry (Erith); 3, Mr. Nichols (Maidstone). Class M: 1, Mr. Pancher (Tonbridge); 2, Mr. London (Tonbridge); 3, Mr. Kinslingbury (Uxbridge); 4, Mr. Nichols (Maidstone).

The trophy for the best fish in the show was won by Mrs. Feek (Brighton). The above are the results of The Hastings and St. Leonards A.S. second open show. It was officially opened by the Mayor and Mayoress of Hastings Councillors H. and Mrs. Funnell. The show was a great success owing to the number of clubs that entered.

**RESULTS** of the second annual show of the **Sever-side Aquarist's Association** were as follows—Guppies (Male): 1, Miss S. Cole; 2,

Miss J. Cole; 3 and 4, K. Owen. Guppies (Female): 1 and 2, D. Sullivan; 3, Maser A. Press; 4, Miss N. Press. Platies: 1, Mrs. K. Martin; 2, Mrs. S. Dodson; 3, P. J. Greenwood; 4, Mrs. J. Bishop. Swordtails: 1 and 3, P. J. Greenwood; 2, Mr. and Mrs. Rossi. Molies: 1, D. Sullivan; 2, Mrs. K. Martin; 3, R. Towler; 4, Miss K. Fielding. A.O.V. Livebearers: 1, R. Onslow; 2, B. Snell; 3, B. Foots. Barbs (B. & C.): 1, R. Hyett; 2, R. Lawrence; 3, Barbs (B. & C.); 4, M. Bishop. Barbs (P. and P.): 1, R. Onslow; 2, B. Snell; 3, D. R. Walsh; 4, T. Tovey. Characins (H. and H.): 1, J. Ferguson; 2, C. Ponting; 3, Miss K. Fielding; 4, B. Foots. Characins (N. and P.): 1, J. Ferguson; 2, Mrs. B. Pedersen; 3, P. J. Greenwood; 4, Mrs. B. Day. Characins (A.O.V.): 1, J. Ferguson; 2, R. Onslow; 3, T. Tovey; 4, T. Tovey. Cichlids: 1, P. J. Greenwood; 2, Mrs. B. Pedersen; 3, R. Toote; 4, Miss K. Fielding. Anabantids (A.O.V.): 1, Mrs. S. Dodson; 2, K. Owen; 3, R. A. Bennett; 4, Mrs. B. Day. Corydoras and Brochis: 1, 2 and 3, R. Lawrence; 4, C. F. Scriven. Catfish (A.O.V.): 1 and 2, D. Noble; 3, R. Lawrence; 4, D. Noble. Botias and Loaches: 1 and 2, Mrs. B. Pedersen; 3, R. Lawrence; 4, Mrs. M. Graham. Rasbora, Danios, Minnows: 1 and 2, B. Foots; 3, R. Onslow; 4, G. Moxham. Labors, Sharks, etc.: 1, 2 and 4, D. Noble; 3, R. Lawrence. Dwarf Cichlids: 1 and 4, R. Hyett; 2 and 3, T. Tovey. Angels and Discus: 1, M. Bishop; 2, C. Ponting; 3, Mrs. M. Graham; 4, D. Sullivan. Cichlids (A.O.V.): 1, A. Quinn; 2, Mrs. M. Graham. African/Asian Cichlids: 1, T. Tovey; 2, B. Foots; 3, R. Onslow; 4, R. Towler. Egg-laying Tooth Carps: 1, M. Strange; 2 and 4, D. A. Walsh; 3, A. Quinton. Pairs (Livebearers): 1, R. Onslow; 2, B. Foots; 3, K. Owen; 4, M. Poole. Pairs (Egg-layers): 1, R. Toote; 2, M. Bishop; 3, R. Towler; 4, Mrs. B. Pedersen. Breeders (Livebearers): 1 and 2, B. Foots; 3, B. Snell; 4, N. Press. Breeders (Egg-layers): 1, Mrs. B. Pedersen; 2 and 3, R. Toote; 4, R. Onslow. A.V. Fish (Junior): 1, K. Bishop; 2, S. Owen; 3, P. Moxham; 4, D. Sullivan. Goldfish: 1, Mrs. B. Daniels; 2, B. Snell; 3, J. Phillips; 4, Mrs. B. Daniels. Bristol Stripedkins: 1, R. J. Bennett; 2 and 3, J. Phillips. A.V. Fantails: 1, J. Ferguson. A.V. Veiltails: 1, R. J. Bennett. A.V. Fancy Fish: 1, R. J. Bennett; 2, J. Phillips; 3, Mrs. M. Graham. Koi and A.V. Pond and River: 1, 2 and 4, R. Lawrence; 3, J. Phillips. Twintails 1974: 1, R. J. Bennett. Breeders Single Tails, 1974: 1, J. Phillips. A.O.V. Tropical Fish (Freshwater): 1, R. Onslow; 2, R. Lawrence; 3, Mrs. K. Martin; 4, Mrs. M. Scriven. Plants: 1, K. Press. Champion of Champions, 1974: (Sever-side Clubs only): 1, T. Taylor; 2, D. Noble; 3, R. Onslow; 4, R. C. Hyett. Highest Individual Points: R. Lawrence. Best Exhibit in Show: R. C. Hyett.

**SHOW** results of the **Grimby and Cleethorpe A.S.** show were as follows—Seniors: Small Anabantids: 1, P. A. Bolder; 2, G. Hirst; 3, S. Smalley. Small Barbs: 1 and 3, H.R.P.; 2, S. Smalley. Loaches: 1, P. A. Bolder; 2, Jackson and Bolder. Pairs Molies: 1 and 2, Bolder. Juniors: Small Anabantids: 1, P. A. Bolder. Small Barbs: 1, R. Leonard. Furnished Jars: 1, J. Hirst; 2, R. Leonard. The Best Fish in Show were shown by R. Leonard for Juniors and P. A. Bolder for Seniors.

THERE were 351 entries at the **Rhonda A.S.** open show which was a fair entry but disappointing in view of the many clubs which were not represented at the show. Results were as follows—Class Ag: 1, Mrs. P. Thomas (Swansea); 2, M. Williams (Rhonda); 3, T. Click (Rhonda); 4, W. Evans (Rhonda). Class Ba: 1, J. Edwards (Rhonda); 2, D. Iles (Rhonda). Class Bz: 1, R. Onslow (Basingstoke); 2, A. Phillips (Rhonda); 3 and 4, C. Turner (Cardiff). Class Ca: 1, C. Turner (Cardiff); 2, A. Phillips (Rhonda); 3, D. Iles (Rhonda); 4, H. Chick (L. Major). Class Cr: 1, R. Onslow (Basingstoke); 2, C. Turner (Cardiff); 3, D. Iles (Rhonda); 4, W. Gibbon (Newport). Class Da: 1, T. Davies (Rhonda); 2, P. Henderson (Rhonda); 3, Mrs. P. Thomas (Swansea); 4, R. Purdy (N. Gwent). Class

Dg: 1, T. Fraser (Basingstoke); 2, A. Gardner (Cardiff); 3, D. Warrnant (Cardiff); 4, D. Oakley (Rhonda). Class Dr: 1, R. Onslow (Basingstoke); 2, D. Warrnant (Cardiff); 3, M. Williams (Rhonda); 4, A. Crier (Rhonda). Class Ea: 1, C. Harding (Cardiff); 2, Mrs. B. Guy (Cardiff); 3, W. Turner (Basingstoke); 4, Mr. and Mrs. P. Dewland (Rhonda). Class Eb: 1, D. Warrnant (Cardiff); 2 and 4, P. Elliott (Cardiff); 3, Mrs. P. Thomas (Swansea). Class F: 1, 2 and 3, M. Endicott (Newport); 4, C. Morrison (P. Talbot). Class G: 1, M. Williams (Rhonda); 2, K. Bruce (Aberdare); 3, J. Edwards (Rhonda); 4, A. and M. Smith (Rhonda). Class H: 1, M. Williams (Rhonda); 2, A. and M. Smith (Rhonda); 3, H. Chick (L. Major); 4, C. Pass (Rhonda). Class J: 1, S. Bart (Rhonda); 2, M. Williams (Rhonda); 3, T. Click (Rhonda); 4, C. Turner (Cardiff). Class K: 1, M. Strange (Basingstoke); 2 and 3, H. Chick (L. Major); 4, W. Evans (Rhonda). Class L: 1, N. Jones (Cardiff); 2, Mrs. P. Thomas (Swansea); 3, K. Williams (Rhonda); 4, H. Chick (L. Major). Class M: 1, R. Onslow (Basingstoke); 2, H. Chick (L. Major); 3, N. and C. Bowles (Rhonda); 4, D. Warrnant (Cardiff). Class N: 1, M. Strange (Basingstoke); 2, A. Phillips (Rhonda); 3, Mrs. B. Guy (Cardiff); 4, T. Davies (Rhonda). Class O: 1, Mrs. B. Guy (Cardiff); 2, W. Evans (Rhonda); 3, N. Sheppard (N. Gwent); 4, J. and D. Slade (N. Gwent). Class P: 1, J. Edwards (Rhonda); 2, D. Warrnant (Cardiff); 3, Mr. and Mrs. P. Dewland (Rhonda); 4, N. Sheppard (N. Gwent). Class Q: 1, 2 and 3, N. and C. Bowles (Rhonda). Class R: 1 and 3, W. Gibbon (Newport); 2, J. Jackson (Basingstoke); 4, J. Egan (P. Talbot). Class S: 1, A. and M. Smith (Rhonda); 2, Mrs. B. Guy (Cardiff); 3, W. Evans (Rhonda); 4, N. and C. Bowles (Rhonda). Class T: 1, T. Fraser (Basingstoke); 2, C. Turner (Cardiff); 3 and 4, C. Morrison (P. Talbot). Class U: 1, 2, 3 and 4, Miss C. Rupert (Port Talbot). Class V: 1, 2 and 3, Miss C. Rupert (P. Talbot); 4, R. Warrnant (Cardiff). Class W: 1, C. Morrison (P. Talbot); 2 and 4, Miss C. Rupert (P. Talbot); 3, T. Click (Rhonda). Class Xb-m: 1, M. Strange (Basingstoke); 2, C. Harding (Cardiff); 3, D. Warrnant (Cardiff). D-ty: 1 and 2, M. Iles (Rhonda); 3 and 4, N. and E. Ross (Basingstoke). Class Xo-t: 1 and 2, C. Morrison (P. Talbot); 3, C. Turner (Cardiff); 4, D. Warrnant (Cardiff). Class B-my: 1, 2, 3 and 4, K. Williams (Rhonda). Class D-ty: 1, and 2, M. Iles (Rhonda); 3 and 4, N. Sheppard (N. Gwent). Best Fish in Show: R. Onslow (Basingstoke). Most Points in Show (All Classes): Miss C. Rupert (P. Talbot). Most Points, Rhonda A.S.: M. Williams.

**THE DEVIZES A.S.** officials are as follows: Chairman: R. Parsons; Secretary: P. Labbett, 22 St. James, Dauntsey, Chippenham, Wiltshire; Treasurer: H. Barden; Show Secretary, M. Brown.

**WINNERS** at the **Huddersfield T.F.S.** Open Show were: Section A, 1: 1 and 3, Mr. and Mrs. Kirk (Castleford); 2, N. Blenkin (Bridlington); 2: 1, Mr. McArdle and Kirk (Castleford); 2, Master A. Atherton (Grimwood); 3, S. N. and M. Rimmer (Sandgrounders); 3, S. Hooton (Sandgrounders); 2, C. and P. Norton (Sandgrounders); 3, Mr. and Mrs. Roberts (Doncaster). Section A, 4: 1, Mr. and Mrs. Entmerson (Castleford); 2, B. W. Carter (Merseyside); 3, W. Blundell (Doncaster); 5: 1, T. Reed (Workop); 2, J. Furness (Castleford); 3, W. Blundell (Doncaster). Section B, 6: 1, T. Smith (Sheffield); 2, D. M. Laycock (Sheaf Valley); 3, Mr. and Mrs. A. Binns (Scunthorpe); 7: 1, Mr. and Mrs. Roberts (Doncaster); 2, D. J. Whelan (Blackburn); 3, K. Lancashire (Doncaster). Section C, 8: 1, Mr. and Mrs. Toynne (Sheaf Valley); 2, Mr. and Mrs. Bull (Derby); 3, Mr. and Mrs. Fletcher (Doncaster). 9: 1, W. Rawlins (Keighley); 2, P. H. Batchelor (Loyne); 3, A. Vaisner (Merseyside). Section D, 10: 1, T. Smith (Sheffield); 2, Mr. Danielson (Ind.); 3, M. Wild (Accrington). Section E, 11: 1, T. Reed (Workop); 2, A. J. Maser (Sandgrounders); 3, R. I. Payne (Merseyside). Section F, 12: 1, A. Axon (Aston); 2, Mr. and Mrs. Roberts (Doncaster); 3, Mr. and Mrs.

Snowdon (York and Dist.), 13: 1, B. W. Carter (Merseyside); 2, Mr. McArdle and Kirk (Castleford). 14: 1, P. J. Whelan (Blackburn); 2, J. Ridley (Heywood); 3, T. Reed (Worksop). 14a: 1, Mr. and Mrs. Fletcher (Doncaster); 2, A. Axon (Aston); 3, S. Hooton (Sandgrounders). Section G, 15: 1, B. W. Carter (Merseyside); 2, Mr. and Mrs. T. Burton (Blackburn); 3, Miss S. Clarke (Aireborough). 16: 1, C. P. Norton (Sandgrounders); 2, Miss A. Gregory (Nelson); 3, G. Newsome (Huddersfield). 16a: 1, B. Wilson (Merseyside); 2, Mr. and Mrs. Roberts (Merseyside); 3, W. Blundell (Doncaster). Section H, 17: 1, W. Blundell (Doncaster); 2, Mr. and Mrs. Harvey (Sandgrounders); 3, D. M. Laycock (Sheaf Valley). 18: 1, J. Robertson (Northumbrian); 2, P. H. Batchelor (Leyne); 3, Dr. P. A. Lewis (Huddersfield). Section I, 19: 1, Mr. and Mrs. Toyne (Sheaf Valley); 2, Mr. and Mrs. Binns (Scunthorpe); 3, P. J. Whelan (Blackburn). Section J, 20: 1, W. Blundell (Doncaster); 2, D. Sugdon (Bradford); 3, Mr. Danielson (Ind.). Section K, 21: 1, P. H. Batchelor (Leyne); 2, T. Ree (Worksop); 3, G. Green (Castleford). Section L, 22: 1, Mr. Abbott (Swillington); 2, Mr. and Mrs. Feasit (Doncaster); 3, Mr. and Mrs. Kilvington (Doncaster). 23 (May): 1, T. Reed (Worksop); 2, N. Carr (Doncaster); 3, P. Armstrong (Heywood). 23 (Hard): 1, A. Vaisner (Merseyside); 2, P. Armstrong (Heywood); 3, F. Chaburn (Heywood). Section M, 24: 1, P. Armstrong (Heywood); 2, Mr. and Mrs. Feasit (Doncaster); 3, Miss J. Cavill (Doncaster). Section N, 25: 1, A. Vaisner (Merseyside); 2, H. Thorpe (Doncaster); 3, M. F. Evans (Worksop). Section O, 26: Miss S. Clarke (Aireborough); 2, S. Walsh (Accrington); 3, C. H. Whitley (Accrington). 27: 1, S. Walsh (Accrington); 2, Miss S. Clarke (Aireborough); 3, R. Atherton (Grimwood). 28: 1, Miss S. Clarke (Aireborough); 2, Mr. and Mrs. Bull (Derby); 3, A. Kaye

(Huddersfield). Section P, 29: 1, A. Kaye (Huddersfield); 2, A. Fersey (Doncaster); 3, A. Wild (Accrington). Section Q, 30: 1 and 2, Mrs. V. Hough (Huddersfield); 3, Mrs. M. Kaye (Top Ten). Section R, 31: 1, J. Robertson (Northumbrian); 2, B. Jackson (Doncaster); 3, M. Wild (Accrington). Section S, 32: 1, Mr. and Mrs. Caidon (Scunthorpe); 2, R. Newsome (Huddersfield).

The Best Fish in Show award was won by W. Blundell of Doncaster with his Corydoras Cat.

#### SECRETARY CHANGES

West Cumberland Aquarist's Club: B. H. Bray, Middle-Moor, Staunburn, Workington, Cumberland.

#### VENUE CHANGES

Due to a very encouraging increase in membership, Middleton & D.A.S. have had to find larger premises. The new Club Room is at the "Boorshaw Hotel," Stanycliffe Lane (off Rochdale Road), Middleton. The No. 17 (Manchester-Rochdale) bus stops at the top of the lane.

Barry A.S. will now hold their meetings on the 4th Monday of the month in a private room at the "Castle Hotel," Jewel Street, Barry, 7.30 p.m. New members and senior citizens always welcomed.

#### NEW SOCIETIES

The North Gwent A.S. has been formed and new members will be most welcome. Meetings are held at 7 p.m. on the second and fourth Wednesdays of each month at the Scout Hall, Armoury Hill, Ebbw Vale. The Chairman is B. Purdy; treasurer, Mrs. J. Sheperd; secretary, Mrs. G. Slade; Committee, Mrs. J. Price, R. Satterley and I. Jones. For further details, please contact the Secretary, Mrs. G. Slade, 10 Cwm-tir, Ebbw Vale, Gwent.

The inaugural meeting of the Munster A.S. was held recently. The society was formed to promote an active interest in the keeping and breeding of tropical fish. The meeting elected a caretaker committee to run the society until the first annual general meeting in May next year. The committee is: chairman, F. Doyle; vice-chairman, P. Owens; hon. secretary, P. Barry, 2 Riverview Terrace, Passage West, Co. Cork; hon. treasurer, B. Farrell; and committee members, H. Keating, G. O'Leary and T. O'Leary.

#### AQUARIST CALENDAR

10th November: Walthamstow and District A.S. Open Show, Mission Grove School Annex, Warner Road, Walthamstow, E.17. Schedules from Show Secretary, A. Chandler, 233 Forest Road, London E11 1LE. Tel: 01-539 3422.

14th-16th November: Loughborough and District A.S. Members Furnished Aquaria Competition, venue John Storer House, Wards End, Loughborough. This is in aid of the John Storer House Foundation.

17th November: Bradford and District A.S. 27th Annual Open Show at East Bowling Unity Club, Leicester Street, Wakefield Road, Bradford.

23rd November: Fur, Feather and Aquatic Aquarium Show, King's Hall, 39 Lower Clapton Road, London, E.S. Show schedules are available from Mrs. Sybil Hedges, Ko Kroner, 150 Ashburton Avenue, Seven Kings, Ilford, Essex.

1st December: Horsforth A.S. 5th Open Show at the new Civic Hall, Stanningley Road, Pudsey. Schedules from: P. J. Smith, 10 Wyndford Rise, Leeds, 16. Tel: Leeds 675712.

## EVERY YEAR IT'S A PROBLEM!

Why not buy your friends one of our popular 'New Look' binders? An ideal Christmas gift.

Bound in maroon rexine with the title gold blocked out of a blue flash appearing on the spine, these strong attractive binders are now made to hold twelve copies of 'The Aquarist' i.e., one complete volume.

**Price £1.25**

(Including postage, packing and VAT)

**Overseas £1.50**

Obtainable from:-

THE AQUARIST AND PONDKEEPER

The Butts, Brentford, Middlesex TW8 8BN.

