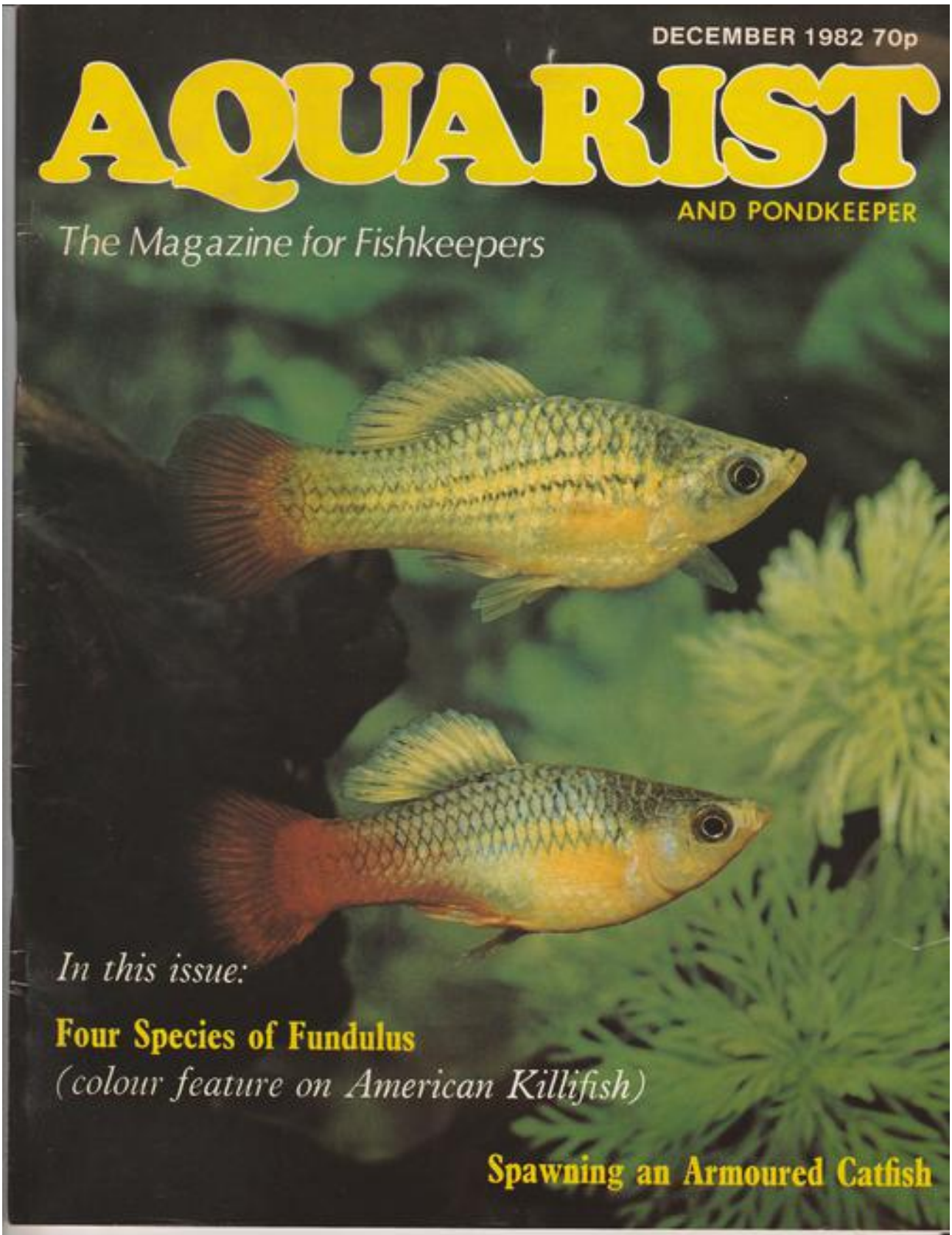
DECEMBER 1982 70p

AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



In this issue:

Four Species of Fundulus
(colour feature on American Killifish)

Spawning an Armoured Catfish

THE AQUARIST AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

Published Monthly 70p

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The Editor accepts no responsibility for views expressed by contributors

Cover plate:
Xiphophorus variatus

Photo by:
A. van den Nieuwenhuizen

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

Subscriptions:
Renewable 31st December annually. (Surface mail) January-December £12-50. Airmail quoted on request.

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. XLVII No. 9. 1982

Editor: Laurence E. Perkins

Advertisement Manager:
J. E. Young

Brian Newton with an Oscar

Meet the Aquarist

Brian Newton

by David Whyatt

THE MAJORITY OF aquarists enter the hobby gradually, adding to their stock as their knowledge and experience increase. Even then, for very many, the number of fish they own, by necessity, must remain small.

Not so Mr. Brian Newton, of Matlock Bath in Derbyshire. At the beginning of November 1980 he had never even owned a goldfish but a few days later he found himself with many hundreds of fish to look after.

He had to learn quickly, he recalls, so got hold of every copy of this magazine he could lay his hands on and then brought books home from the library by the dozen.

"There were large Mirror Carp, Koi, Golden Orfe, Green and Golden Tench and assorted Goldfish and Catfish," he says. "And that was just for starters."

That he managed to learn the ropes so quickly says a lot for his stamina. Even so, after his first year he admits to still having much to learn.

"How I came to be a fish keeper in the first place," he explains, "occurred when the family business bought an entire building block, which consisted of a gift shop, space suitable for making an amusement centre and—of course—the Aquarium."

The Matlock Bath Aquarium is easily the most interesting. Built about 14 years ago, it occupies the same building as the once famous Hydro, which goes back to 1883. The pool, which is fed continuously from thermal springs at 600,000 gallons a day, is the star attraction.

It measures about 15 ft. × 30 ft. and varies in depth from 4 ft. to 10 ft. The temperature of the thermal water remains constant at 68°F. During the summer months, the Matlock sub-aqua club have fed the fish by hand—much to the delight of the visitors and at least one TV crew—and it is a big draw to amateur photographers interested in underwater photography.

There are about a hundred fish in the pool, most of them large but none more so than a pair of koi measuring about 2½ ft. says Brian.

"Some of the visitors have suggested the thermal waters must be responsible for the giant size of some of the specimens," he adds. "Well I don't know about that but, it doesn't appear to do them any harm."

He finds it difficult to calculate how much food is eaten by the fish but the cost of the food isn't the main outlay anyway. That distinction goes to rates, heating and lighting. Brian intends to put in central heating one day and several times over the past twelve months has thought how cost-saving it would be if only it were possible to utilize the naturally heated thermal waters for all the fish, instead of just those in the large pool.

Running an aquarium is evidently an expensive business but in one direction at least he is able to cut the costs to the bone. He spends little on labour, doing most of the work himself in a 12 and 14 hour day.

When I spoke to him, it was mid-winter and the aquarium was opened only at the week-ends. This was the time for maintenance work and

Osphronemus goramy one of the many exhibits at the Matlock Aquariums

improvements, he told me, adding that he had recently finished insulating the roof.

There are plans to put in an amusement centre shortly, which will also be run by Brian and his family. Making the aquarium more attractive will be left to Brian himself.

"I have done a lot of work already," he says. "I'd like to see a new roof, get in some vending machines so that visitors can feed the fish themselves, and have tropical birds and plants.

"With visitors coming from all over the world, I want it to look good. And I like to think I am doing my bit to encourage people into the hobby," he says.

Matlock Bath has long been famous as a spa town. A fountain bath was built there in 1786 and for nearly a hundred years was in constant use.

The larger Hydro that replaced it offered treatement of greater sophistication.

Sufferers from Rheumatism, gout, lumbago, sciatica, nervous and kidney complaints took advantage of the private bathrooms, or swam in the pool in their quest for improved health.

Many of the old fixtures are still to to be seen—the drinking fountain, the ornate decor and, of course, the pool, so that visitors today can indulge in a walk through Victoriana as they inspect the fish.

Where there were bathrooms and consulting rooms, is the tropical section; where people of a by-gone age climbed the cast iron staircase to their bedrooms, visitors now make their approach to the display tanks which line the catacomb of rooms.

The Aquarium houses hundreds of fish and amphibians including Hell Benders, Osphronemus Gouramis, Shovel Mouth Catfish, Piranhas, Malawi Cichlids, Alligator Gar Fish, Red Eared Terrapins, Snake Heads and Pike.

A favourite with Brian is the Mozambique Mouth Breeders which incubate their eggs in the mouth and, in the event of danger, temporarily suck in their young for protection.

The tanks are heated individually and aerated by a large compressor in the basement of the building. "There is under gravel filtration in each tank," says Brian.

So far, prices have been kept down to 45p for adults and 25p for children, which has included any displays that are put on. However, these may have to be reviewed shortly.

"During the late summer, the pool is illuminated at night by underwater floodlights," says Brian, "and the original passage, built nearly 200 years ago to join the thermal springs to the pool, is usually an interesting diversion to the visiting aquarist."

The pool—where Victorians once bathed to relieve their ailments and now home to Brian Newton's fish

The female has already deposited a large number of eggs, the extended ovipositor can clearly be seen

A not-so-common CICHLID

Aequidens itanyi

by R Zukal

THESE CICHLIDS are not widely distributed amongst the ranks of fish-keepers. They were first imported in 1963 by Heinrich Espe Bremen from the soft waters of the deeper and thus gentler stretches of the tributaries of the lower Itanyi river in French Guyana. Adult fish have almost oval, laterally compressed bodies, in small specimens the body is not drawn out as much lengthwise. In adult fish sexual differentiation is straightforward, for the male is larger and has more elongated fins. The sexes are not markedly different in coloration. Both are coloured sea-green and cinnamon-brown. A black band runs from the upper corner of the gill cover to the end of the soft dosal fin. In fully grown fish this band is no longer apparent, or if it is, then only intermittently. It is replaced by six, black, rather irregular, lateral spots, which can clearly be seen in the species nocturnal coloration. The iris is greenish-gold. The fish grow quite big, the male to about 12 cm.

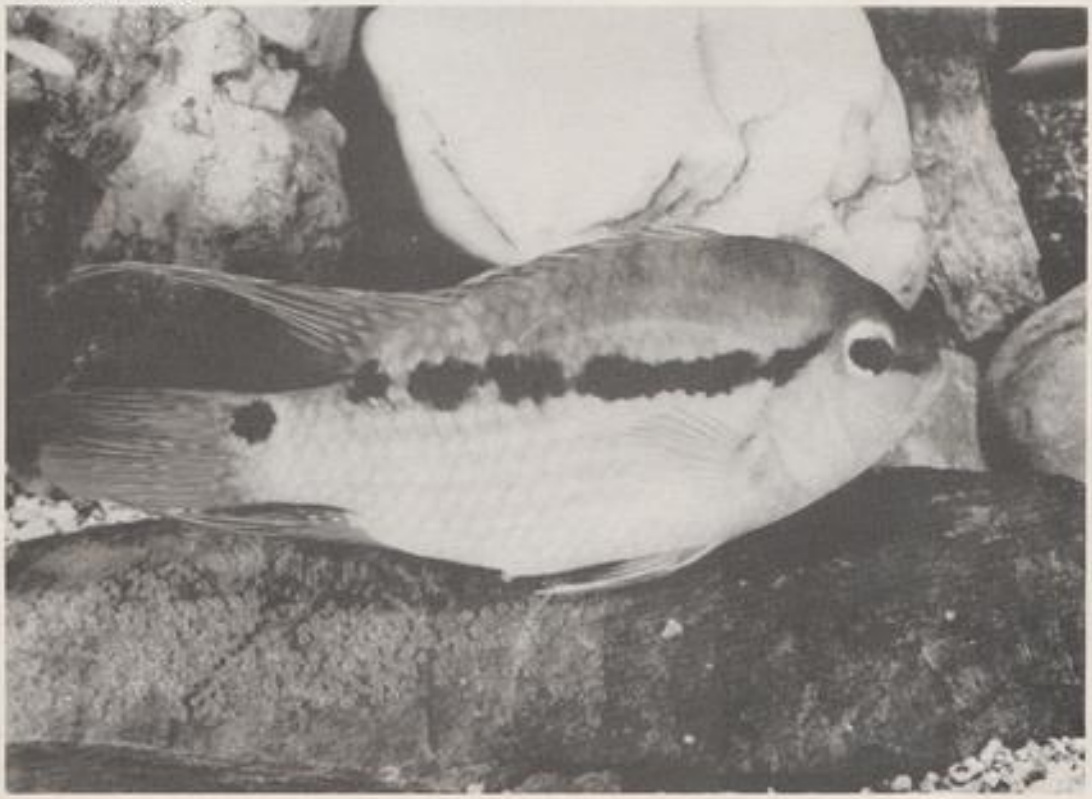
One must keep them in a largish tank and one can also keep them with smaller fish as, apart from spawning time, they are not aggressive. If there is sufficient space they take over and defend a territory. Plants, too, are not damaged. Only those which are in the way are torn out before spawning. The water should not be hard, neither should it be soft. Normal drinking water from the mains is suitable. The temperature should be 22°C and more. The fish prefer live food, but also frozen food is accepted readily. Good filtration and partial water changes are necessary. If one keeps several specimens together, it is easy to pick out from adult fish a pair which is suitable for breeding. The pair disassociates itself from the other fish and it is better to transfer the pair to a spawning tank. Otherwise the young or even the eggs will be eaten out of anxiety.

For breeding a 50-80 litre tank is big enough, containing drinking water which has been allowed to stand and heated to a temperature of 26°C. If there is a sand bottom, a few plants are placed in the background, otherwise a sufficient number of largish stones to provide hiding places for the female should she need them. The male often becomes unpleasantly aggressive and damage to the female's fins results. On the sand bottom a few flat stones are placed in a central position which are used as a spawning site by the fish. After being transferred into the spawning tank the fish are usually very shy and must not be alarmed, otherwise they dash against the tank sides and injure themselves. Often they will not

The pair engaged in spawning, the female on the left

even take food for a few days, but they settle down and change their behaviour. If one is lucky one is able to observe them spawning. Otherwise they spawn in the early hours of the morning, not wanting to be disturbed. It often happened that I went to the tank in the morning and the stone was already covered with eggs which were being guarded by the female. In the beginning the eggs disappeared on the following day. Presumably they were consumed by one of the parents. Fortunately, the fish spawned virtually every fourteen days. One afternoon, during my absence, they spawned again. This time I wanted to be clever and I removed the male. But it was to no avail, the eggs disappeared again. So the female had to be the problem. I reunited the pair and fed them generously with coarse foodstuff, thinking to myself how much patience an aquarist needs to have. It was worth the effort. The female's extended ovipositor and the cleaning of the stone were a signal that spawning was about to occur. Finally, the female deposited the first eggs in a string-like formation. The male was very shy and cautious at first, but he came up and fertilised the eggs. The fish took turns to spawn or they spawned simultaneously. After about two hours everything was over and there were about 500 eggs. After spawning I removed the male and left the care of the brood to the female. After a few hours I changed my mind and, although I felt sorry for the female, removed her too. I arranged gentle aeration in such a way that the air bubbles caressed the eggs and so to some extent made up for the absence of the mother. In this way I was able to rear about 300 young in the end. Later however, I had pairs which looked after their young together in an exemplary fashion. This goes to show that the fish are individuals in their behaviour and by no means identical in character

The male is larger, with a smaller sexual organ



BEGINNING WITH TROPICALS part 16

by Roy Pinks

MY OFTEN REPEATED advice to the beginner to hasten slowly is based on the fact that the emotional build-up to the acquisition and setting up of that first tank is an enjoyable experience: unexpected early failures often bring complete disillusionment, which our counselling always sets out to prevent. In this article I will discuss a few of the fish species which, although established favourites, often lead to trouble and may therefore best be treated rather specially.

Perhaps I should say at the outset that we can never, in a short series for beginners, cover every safety aspect, but the buyer can help himself very considerably by carrying out his buying in a thoughtful way. Although I have heard some retailers giving perfectly hideous advice to buyers, it must be accepted that the vast majority are in business and wish to stay there, and it is sound commonsense to give realistic assessments on the fish they sell. So, if you have the nous to declare yourself as a beginner, you will usually get a fair deal; many people try to give the impression that they know it all, in which circumstances the retailer is quite entitled to assume that his responsibilities do not extend much further than putting some reasonable specimens in the bag and not overcharging you. But you will certainly get a different response if you take your worries and uncertainties to your dealer at the weekend peak selling times—Sunday morning is usually a nightmare, and it is just plain silly

Harlequin fish

to expect VIP treatment then. When I consider how accommodating much of the trade has been in keeping stores open during lunch hours and in closing late for the benefit of working people, the demands often put on it by customer habits are not at all fair. If you are not too sure when your retailer has spare time to devote to you, simply ask him, as he is usually only too keen to help.

Turning, then, to some of the species which may take your fancy, but which sometimes go amiss, I suppose that the Harlequin (*Rasbora heteromorpha*) is one of the prime inconsistencies. Its dark triangular body patch and quite gorgeous rosy-copper upper parts put it in the front line for looks, and as it has a marked shoaling tendency it recommends itself very forcibly. The presence in the stock tank of thin, struggling specimens must be taken as a warning of dire things to come, but even if all seems well, these fish so often erupt with White Spot or Velvet disease within a week or two of a water change,

and they do not seem to possess the stamina to overcome the exacting process of medication as is the case with more reliable species. Time after time I have bought up to a dozen of these fish and finished with less than half that number. Oddly, those which have survived have usually developed into outstanding specimens but on the whole I do not rate this a long lived fish, as it has usually disappointed after much initial promise. One always suspects water quality when a species proves not to be up to expectations, but as the Harlequin likes pretty much what the Neon will accept, and the latter seldom prove a worry sharing proper conditions, this factor can be largely discounted. *Tanichthys albonubes*, the White Cloud Mountain Minnow, likes water at the other end of the spectrum (about pH 7), but I have found that its tolerence as to deviations is not in keeping with its popularity as an aquarium fish. It very much prefers its own conditions and its own company, when it will look its best and breed quite easily, but almost as soon as it is mixed with other species it seems to take a background rôle, never shows its best colours, and often succumbs to Velvet disease. Fortunately, with this knowledge the beginner can set this species up in a dedicated tank and derive a lot of satisfaction from it—it is quite cheap and will thrive at far lower temperatures than the majority of tropicals. Try gradually lowering the temperature to 65°F and let it vary a degree or two above and below this, and the White Cloud will most likely surprise you with its performance. Such conditions would not work with most tropicals you are likely to encounter. An added bonus will come from vigorous aeration!

If you are attracted to the Barbs, remember that pH6·8 and absolutely clean water conditions are a must. There is one more serious mistake the beginner can make than to include Angelfish in his first mixed tank, and this is the introduction of a handful of Tiger Barbs. Perhaps the most attractive of the whole family, and certainly the most lively and engaging species you may ever see, it is nonetheless a vicious tearaway both to its own kind and to others, so is best avoided altogether until you have the opportunity of trying it out on its own. The trouble here is that you may well acquire a few of these attractive fish and introduce them successfully—they seldom seem disease-prone, and you will begin to regard these notes as alarmist. Unfortunately, within a few weeks one fish will take the dominant role and that will be the end of the peace and quiet. A tank of the several and attractive species of barbs is a very worthwhile enterprise when you have had some experience in aquarium management and have read up and understood the fundamentals of water chemistry in relation to the mixture supplied by the local authority. Despite the claims of many suppliers, the correction of water conditions is not all that simple or long lasting, and you are best advised to base your management on either what comes out of your tap or on carefully collected rainwater. In most cases, these separately or in combination, will give satisfactory and consistent results.

WHAT IS YOUR OPINION?

by B. Whiteside, B.A., A.C.P.

I SHOULD LIKE to wish all my readers—especially those who took the trouble to write to me in 1982—a happy and enjoyable Christmas. It takes a fair amount of effort for most people to write a letter—and I appreciate the effort made by those who wrote to me during 1982; and, indeed, during the previous 15 years of *W.Y.O's* existence.

I did not have to replace many light bulbs above my aquaria during the warmer months of summer—possibly because of the higher temperatures of a good summer, followed by an Indian summer; or possibly the protracted periods of sunshine meant that I had my aquarium lights lit much less frequently than in winter and, hence, the bulbs lasted much longer because they were lit for very much shorter periods.

Someone in a position to shed some light on incandescent bulbs and fluorescent tubes is Mr. C. A. Ashmore, Press Officer, Press and Publicity Department, Crompton Parkinson Limited, Woodlands House, The Avenue, Cliftonville, Northampton, NN1 5BS, whose company manufactures both bulbs and tubes. Mr. Ashmore writes: **"With reference to the *What Is Your Opinion?* feature in the August 1982 issue of your journal, a letter from a Mr. John Taylor makes a reference to 'a cheap source of light bulbs,' and states that Rough Service lamps are available from a number of factoring and wholesaler sources.**

"It might be of interest to your readers to point out that although this company markets this type of tungsten filament lamp, by far the best value for money can be obtained from tungsten lamps by the use of the 2000 hour-rated Double Life type. These lamps, originally developed by this company for the National Coal Board, provide double the average burning time of a comparable standard 1000 hour lamp, but at less than twice the price.

"However, the most cost-effective method of providing efficient illumination is by the use of the new 1 in. (26 mm.) diameter krypton-filled Crompton Wattsaver fluorescent tubes which are now readily available. Manufactured in standard 5 ft., 4 ft. and 2 ft. lengths, these lamps not only give up to 10% savings in power consumption over the older 38 mm. diameter tubes, but also provide virtually the same light output from a substantially smaller source.

"The full Crompton Lamps range including Crompton Double-Life tungsten lamps and Crompton Wattsaver fluorescent tubes is marketed through most major electrical wholesale and retail outlets throughout the U.K.

"I hope that the above will be of some assistance, but should you require any further details on products within the Crompton range, please let me know."

I should be pleased to receive readers' comments on Mr. Ashmore's letter; and from those who have used Crompton lamps or Crompton Wattsaver fluorescent tubes. A most important aspect of aquarium lighting is its effect upon plant growth in the decorative aquarium. Does the Wattsaver fluorescent produce good plant growth?

Mr. Richard Martin resides at 21 Dulwich Grove, Kingstanding, Birmingham, B44 0EQ, and writes: **"In my experience *all* air pumps are too noisy. I reduce the noise output from mine by means of a cheap and simple silencer—the maximum cost of which is 20p."** Mr. Martin's silencer consists of a 250 ml. fizzy drink bottle with a metal screw cap. Two holes are drilled in the cap of the bottle. One accepts an air line from the pump and this tube extends to near the bottom of the bottle; the other tube, which extends only about one quarter of the way down the bottle, provides the exit from which the air line takes air to the filter. Obviously the screw cap and the two holes through it must give a tight fit to prevent the escape of air.

Recently I mentioned having bought 21 new fish to fill up spaces in some of my tanks. Unfortunately the new fish that I introduced into two of my tanks brought a nasty disease with them. *Oodinium* broke out in two of the tanks; and despite immediate treatment I lost quite a number of fish. About a dozen guppies died in one of my guppy tanks; and in another I lost my eight cardinals—five of them fully-grown adults—together with four young neons, a red-eyed tetra and a couple of dwarf pencilfish. The first 'cure' I used did not appear to affect the ailing fish and deaths continued; however, the second cure appeared to effect a cure—although it is possible that the combined effects of the two cures effected the final cure. I was particularly disappointed by the loss of my cardinals. Attempts to obtain new cardinals have so far been unsuccessful. "Next week" appeared to be the expected delivery date quoted by a couple of dealers.

I decided to buy another selection of new, *young* fish while visiting a Belfast dealer's shop. Two bronze catfish cost 90p each; five dwarf pencilfish 40p each; four neons were 30p each; one red-eyed tetra 40p; two golden honey gouramies cost £1·00 each; and two clown loaches were £2·00 each. All the fish, as previously stated, were young ones. How do the prices compare with those in your area? The fish were put into different tanks.

I was particularly interested to see the progress of the young clown

loaches. I put them into a large tank that houses a collection of gouramies, a pair of large, well-grown clown loaches, one black widow, a pair of *Corydoras*, and an attractive pair of bright-red barbs. Yesterday morning I studied the tank and was pleased to observe that all the fish had survived the night and that all appeared to be in good health and feeding well. Later on, yesterday, I decided to clean the front glass of the tank and glanced in to study my fish. The pair of barbs were missing—which did not cause me undue distress because the tank is well planted and there are plenty of places where fish can hide for several days if they wish. I missed the red flash of the barbs and studied the tank more carefully. I found one of the barbs floating dead amongst the surface plants. There was not a mark on its healthy-looking body. The only particular thing I noticed was that its mouth was open in death. Last night I studied the tank again and found the second barb, lying dead on the base gravel with its stomach missing. The barbs had been in the tank for over a month and had appeared to be in excellent health until they 'vanished' yesterday afternoon.

My two adult clown loaches, plus one of the young ones, appear to be 'panting' very rapidly. I'm keeping my fingers crossed that they won't end up as the barbs did.

Yesterday was a beautifully warm, sunny, October day when I spent some time in my garden cutting my lawns and observing my roses. It was pleasant to be able to work in shirt sleeves and breathe in the combined smells of roses and cut grass—not to mention petrol and exhaust fumes from my lawn-mower. (I've just corrected by Freudian slip of "cut glass"—which older readers will know has a special significance for me because I severely damaged my left wrist and hand in December 1969 when trying to remove a broken pane of glass from an aquarium. I feel the stiffness of my damaged hand as I type this with the small finger of my left hand and the index finger of my right. Please take care when working with glass and avoid the possibility of a severed nerve. Like the Ancient Mariner, I still have a compulsion to re-tell the tale and warn others).

Bar superb days such as yesterday the weather has changed somewhat and temperatures are, in general, getting lower. As recently as yesterday I saw a beautiful butterfly in my garden visiting the roses. I saw more butterflies in my garden this year than in the past ten or so years put together. I assume that the extra sunshine and heat helped them to hatch and survive. Maybe we'll see even more next year.

Perhaps I should have kept my mouth shut about life spans of light bulbs being longer—possibly because of the warmer weather. Since I typed the second paragraph of this month's feature three light bulbs have blown. All three were Mazda bulbs, said to give at least 1,000 hours of life on average. They have certainly come out very well in my continuing survey: 180 days, 188 days and 197 days. Does that put them in the lead? The previous bulb that blew was a Woolworth's Winfield bulb that lasted 138 days; and the one before that a Mazda, identical to those mentioned above, that survived for only 17 days.

No. 40 Keir Hardy Street, Greenock, is the home address of 15-years-old Master Innis Drysdale. He writes: **"I am a quite new reader of your magazine and was reading your latest *W.Y.O.* in the September 1982 issue. I thought I would drop you a few lines about breeding small tetras. I have been keeping tropical fish for about a year now and have two 24 in. × 12 in. × 15 in. aquariums. One is a community aquarium and in the other I keep four angelfish. I do not belong to an aquarium society but I will join Greenock A.S.**

"The tetras I am writing to you about are neon tetras (Photograph 1). Believe me, I couldn't believe my eyes when I saw them breeding in my community tank. The other fish in the tank are swordtails, guppies, beacons and a platy. When I saw the spawning early one Sunday morning just before I was putting on my light I immediately grabbed my camera and took some photographs—which have not yet been developed. The fish were in among the plants chasing, and rubbing their bodies together. Now I have only five neons as two of them died of what I thought was a cancerous growth. The fish lost their colour, went off their food and developed huge swellings on their stomachs.

"I really enjoy reading *W.Y.O.* and hope it will go on for another 15 years. P.S.—When I get my photographs I will send you a few."

15-years-old Master Robert Robinson hasn't been too successful with fish photography because his rather expensive Olympus camera and Boots flash gun present problems of flash reflections from glass when used for aquarium photography. I gave Robert a very quick lesson on fish photography

Neon tetra

and let him borrow my much cheaper camera, and flash, together with my little, plastic bracket. In return I borrowed his Olympus and flash—plus two brackets, one of which Robert made in a metalwork class. His main problem was the absence of a flash cable socket on his particular Olympus model; and a peculiar, non-standard connector on one end of his flash gun cable. Naturally, both camera and flash are fitted with hot shoes—but these don't suit the photographic technique that I use. I have not yet had time to try out Robert's camera but I look forward to seeing what he manages to photograph using my inexpensive outfit. Perhaps he'll soon be in a position to illustrate his own articles about aquarium fishes.

I should be delighted to see any readers' fish and aquarium photographs —either slides or prints. If you send me some, please enclose a s.a.e. for their return and pack them so that they won't get bent in the post—especially if you send them in the post with the annual flood of Christmas cards.

Incidentally, before leaving the name Olympus, the last time I handled an optical instrument made by Olympus was in hospital some weeks ago when, because the injected anaesthetic had not affected me, I was permitted to look down the eyepiece of an Olympus gastroscope and study the inside of my own stomach and intestine. It was an interesting—if unexciting—experience that I would not recommend. So much for the stories about drifting off on a dream cloud of Valium. Two injections left me wide awake; while smaller quantities had a couple of other hospital patients sleeping for an hour or two afterwards.

Mr. R. G. Gowing resides at 165 Oak Tree Lane, Bournville, Birmingham, and he writes: **"We have a tropical tank stocked with a variety of tetras, a few** *Corydoras*, **a small shoal of white cloud mountain minnows and one** *Otocinclus affinis* **(Photograph 2). We found that there were also a fair number of small snails in the tank; but by the daily removal of those that**

Otocinclus affinis

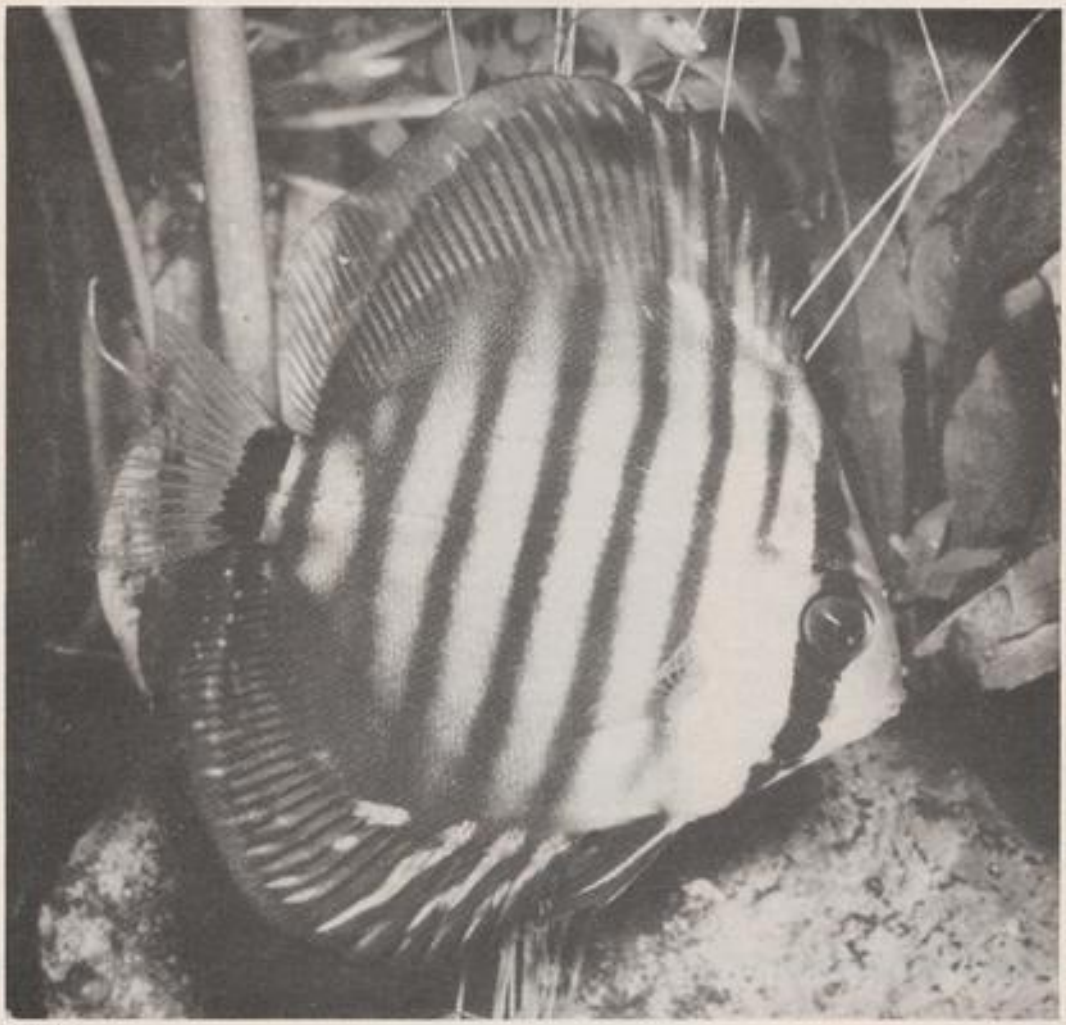
found their way onto the glass during the hours of darkness we did appear to be containing their numbers. Recently we decided that there were sufficient algae in the tank to support another *Otocinclus*; **but none of our local dealers have these in stock at present; nor does there seem to be any prospect of obtaining one in the near future. We were, however, offered a** *Synodontis angelicus* **(polka-dot African catfish) as a suitable alternative. He is a delightful, entertaining fish and we are well pleased with him; but his introduction to the tank has set off an unexpected chain of events. (1) All our snails have disappeared. We can only assume that our** *Synodontis* **has eaten them. (2) With the disappearance of the snails we have more algae. Our next assumption is that the snails were eating the algae.**

"We would like to try to restore the balance, bearing in mind that our tank is fully stocked. We could accommodate just one more *Otocinclus*, **if we could find one, although we doubt if that would solve the extreme algae problem.**

"Should we introduce a few, say six, larger snails? Would larger snails survive the attentions of our *Synodontis*? **He is only small—perhaps 2½ in. including the caudal fin. Do you have any suggestions to offer?"** (Algae thrive when they get sufficient food and light, and where there is little competition from higher plant forms. I suggest you cut down the amount and duration of light entering your tank; that you change part of the water—say, one third—regularly; and that you introduce more aquarium plants to us more of the available food and light. If necessary, an algae killer—I prefer an American brand that comes in tablet form—may be used; but follow the manufacturer's instructions exactly. If weeds grow in my garden I pull them out or use a weedkiller to kill them. I don't buy a goat, or add some snails, to clear up the weeds. When I have the weeds removed or killed I try to introduce some ground-cover plants in an attempt to keep out more weeds in the future. If you do clear a lot of the algae plants from your aquarium do ensure that your catfish don't die of starvation. The dealer from whom I bought the young clown loaches reminded me to ensure that some food—such as tablet food—reached the bottom of the aquarium or the young clowns could die of starvation. Like the adult ones, they have already been feeding at the surface of my aquarium. I hope these comments help you to solve the algae problem. It would be unwise to introduce another fish to a tank that is already fully stocked; and a few snails would do little to control excessive algae. B.W.)

"First, let me congratulate you on an excellent column, as I feel it allows readers to express their opinions on our hobby—and makes for first-class reading," writes Mr. A. Jones, of 248B High Road, Chadwell Heath, Essex. He continues: **"I am writing to you to say how much nonsense I think is written in books about the temperament, etc., of some fish—especially the discus,** *Symphysodon discus*. **As I have been keeping these fish for ten years without serious disasters I think I can impart some information that might be of interest. (Photograph 3 shows a discus.)**

"Contrary to popular belief the discus does not need to be kept on its own, in the quietest corner of the house, in water that must pass the strictest chemical tests, in a tank planted with a forest to allow for countless hiding places. These factors only encourage the fish to be shy and finicky. As long as the fish are obtained from a



Discus

reliable dealer—the most important point—and have been kept in the local water—take along a test kit if you are unsure and ask if you can compare the water with yours; the dealer will not object if he is honest; and after all discus are never cheap—all should be well.

"My discus are all perfect community fish and kept in busy areas. This encourages the fish to compete and become confident. They soon assert their authority, being cichlids—another fact that many people seem to forget. My fish neither hide nor tremble in a corner at the approach of one of my family. In fact, they accept food eagerly from one's fingers.

"As long as a few basic points are adhered to no problems should arise with these beauties. (1) Reliable purchase source. (2) Regular live food; in my experience discus will not thrive on dried foods. (3) Good filtration—and water circulation. (4) Water change of 20% weekly. (5) A temperature of 80 F. (6) Keep your eye on the build up of carbonate hardness."

Mr. Tony Jacques, who resides at Flat 12, Durham Close, Durham Road, West Wimbledon, London, S.W.20, is the Public Relations Officer of the South Park Aquatic (Study) Society. He writes: "As a connoisseur of

society publications I thought you might like a copy of the first two issues of our newly-launched Newsletter. S.P.A.S.S. specialises in coldwater fishkeeping as we try to cover as wide a cross-section of the temperate hobby as possible and hopefully you will find at least some of it interesting reading. Please don't mark it too harshly for spelling and grammar! Keep up the good work on *W.Y.O.*"

Issue 1 of the S.P.A.S.S. Newsletter is dated May 1982, and issue 2 September 1982. Both contain an interesting selection of subject matter. Topics covered include showing fish; shopping corner; high protein foods; live foods; diseases and ills of goldfish and koi; and water.

Photograph 4 shows the most attractive, tropical plant *Barclaya longifolia*—a beautiful lily. Please write to me if you have successfully kept this delightful plant.

Mr. Tim Share writes: **"I am glad to see you printed my letter about fish farming. My address then was in Walsall. My current address is c/o Glebe Cottage, Burwarton Trout Farm, Cleobury North, Shropshire; and, as you will gather, I am now working on a trout farm not too far from Walsall. If any of your readers show any interest in my article I would be glad to answer any of their questions. I'd also like to hear of any criticisms. Also, if you would like any additional material for yourself or the magazine you are welcome to it. Unfortunately I know little about fish farming where you live. Any information which you could give would be of great interest to me. With luck I may be coming over to Northern Ireland to look around fish farms in the country next August—finance providing, of course.**

Barclaya Longifolia

"The farm on which I am now working is of great interest to me and has given me yet more information on this subject." (I should be pleased to know if many readers are interested in trout hatcheries or fish farms. I produced a photo-feature on both items for possible publication. B.W.).

Master Trevor Stiling is 15 years old and lives at 170 Holly Park Estate, Crouch Hill, London N4 4BL. He has been keeping fish for three years. He writes: **"...At present I have just one 36 in. tank which is overstocked at the moment—I think—but the fish have been okay. I think that you and your readers may be interested to hear of my fish. I keep six black widows, one loach of some sort, and seventeen Texas cichlids—*Cichlasoma cyanoguttatum*—which range from all sizes up to 3 in. I think of this as an achievement as this species is somewhat aggressive. I have no idea for how long these fish will stay peaceful as I don't know too much about them. Perhaps a reader could advise me?"**

Time has beaten me once again. Please send me a few lines on any of the following topics: (a) brightly-coloured fish; (b) cleaning power filters; (c) good aquarium books; (d) live foods; (e) your most memorable successes during 1982—and your greatest failures; and (f) electronic heater/thermostats. Best wishes until we meet in 1983.

OSCAR **G. Robinson**

by
Roy Pinks

JUDGING by the number of queries about how to prevent water plants dying, many aquarists will welcome suggestions for species which defy even the worst effects of neglect. But the most painstaking of us suffer failures because we omit one or another of the essentials for successful culture. Perhaps we have indeed provided all the environmental factors by way of light substrate and water quality, but forget that hungry fish and snails can undo all the good preparatory work in the space of a few days. Efforts to counter all this by purchasing tougher looking plants (usually at great expense) seldom work out either, and this is often because outward appearances are very misleading: what looks strongest may decay quickest, and it is the most wiry and slight which pass all the tests. A few years ago I was buying some tropical plants at the Everglades when my interest was drawn to some exciting-looking clumps of light green plants—somewhat like saxifrage—pushing their way out of the water in several of the large outdoor coldwater pools. Mr. James described them as a cress (Crassula) which did well with him and were worth a fling in both coldwater and tropical surroundings. Accordingly I took away a few roots, but I expected very little from them because the only place I could give them was in the large pond, and winter exposure in that particular spot is calculated to put paid to more specimen plants than I care to admit to. With such low expectations I merely buried the roots in several mud-filled flower pots and set them in the shallows which averaged about 8 in. of water. Their progress that autumn was very pleasing if not spectacular. For those not familiar with the plant, it resembles milfoil in growth habit, but the leaves are spaced further apart, and they are flat and pointed rather than hairlike. The colouring is a light apple green, sometimes yellowish, but at all times bright. Looked at from above the plant seems to be projecting dozens of attractive stars, formed by the leaf whorls. It also has a tiny white flower.

These plants surprisingly came through the following winter and increased in spread during the following season—a disciplined growth which was a pleasant change from the rampant extravagance of so many of the recommended poolside species. I then noticed several clumps of this very plant doing particularly well in a tropical display tank at a local retailer, and as I was just about to set up a coldwater tank for my Bitterling I rammed a few pullings from the pond into a pot filled with compost, concealing the latter behind some convenient rockwork. The crassula gradually turned itself towards the available light, which happened not to be of the best, as the tank was north-facing, and settled down quite uneventfully. It was only about a year later, when I was taking stock of plant performance, that I noticed how amazingly consistent this group of plants had been. In all this period it had perhaps grown an inch or so, but the overall spread was much as it had been at the outset. Astonishingly, hardly a single leaf seemed to have been lost from any cause, and all the stems remained tightly clothed with their attractive stars. I cannot recall ever having grown a plant with this habit which has not finished up with that annoying "palm tree" effect—all stem and top—which instantly betrays cultural failure. Encouraged by this success I tried a few plants in a tropical tank mainly lit by artificial means, but this failed completely with a few weeks. I would not write it off as a candidate for warm water because my conditions were suspect on several counts. It might well be ideal for some of those semi-tropical aquaria, in which White Clouds and Golden Medakas do so well, at temperatures in the upper 60°F.

After the frightful temperatures of last winter I was surprised to see the

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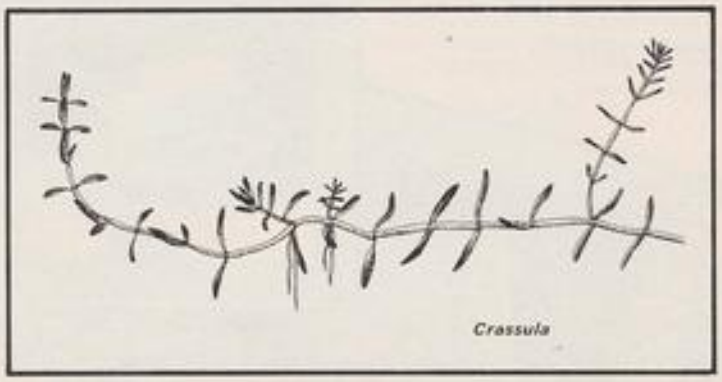

Crassula

by Eric Hardy

Is the British Association for the Advancement of Science on its way out? Attendance at its 1982 annual meeting at Liverpool University was well below that at York in 1981, and the whole meeting much shorter than 1953's, which I attended in Liverpool with capacity audiences, though this time lecture-theatres were only half full or less. I represented my school at its 1923 Liverpool meeting.

Aquaculture got a good hearing this time, and we visited Liverpool's East Sandon Dock where the water, specially oxygenated for rearing caged rainbow-trout, ropes of mussels and rafts of Japanese oysters, has started attracting wild prawns to join its wild shrimps, sticklebacks, codling, crabs and whiting. It has more sea-anemones, sea-squirts and starfish than one finds at Hilbre island in the Dee.

Speaking on Aquaculture in Perspective, Dr. A. I. Payne of Coventry's Lanchester Polytechnic said that the present glut of trout and high cost of their food made trout-farming "the fastest way of going broke in Britain today". Almost no significant contribution to world aquaculture comes from marine culturing, almost all is fresh or brackish water, even ocean milkfish in Taiwan and the Philippines.

Marine aquaculture lacks techniques for mass production of fish-fry and very few marine fish will spawn under conditions of culturing, except by manipulation of environmental stimuli or hormone-treatment. Even with grey mullet (Israel) and milkfish in brackish water, wild fry are collected. Prof. R. J. Roberts, Director of Stirling University's Institute of Aquaculture, aimed for more fish-training with veterinary surgeons. Jokingly he told of the vet whose customers brought their ailing pet goldfish, which the vet took into a back room where he kept a tank of such fish, returning with one swopped for the "patient" he had thrown into the bin. He mentioned the wild bird vectors of disease, like pelicans hosting parasites of Tilapia, and preventing swirling disease now attacking many trout-farms by not putting young fish into the pond until their bones were calcified. Furunculosis in salmonids doesn't respond well to antibiotics because salmon are difficult to feed in freshwater, or to inoculate.

You cannot take a sick fish's temperature, he pointed out, because it doesn't develop a fever, being "cold blooded". Fish with septicaemic infection actively seek out warmer water to give themselves a higher temperature and allow their defences to work more efficiently, like sweating-out a cold in a sauna bath. Eye-fluke causes epizootic blindness in fish by encysting in the eye-lens. This results in the fish being more easily caught by birds which are the hosts and distributors of the parasite to other fish-waters. Expensive Koi and tropical aquaria fish can be anaesthetised individually for surgery, or injected with antibiotics or vaccines. Less expensive ways are necessary with cheaper, more numerous fish in a water, like bathing and spraying as external treatment. Drugs can be incorporated in fish-pellets, but sick fish don't eat. A vaccine

Norway lobsters keep territory around their burrows from intruders. In shallow water they emerge only after dark; in deep water in daytime
Photo: Dr I D Priede

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COMMENTARY

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crassula emerging from the shallows when a much kinder spring did its best to make up for all that. It has done well again this season, and further witness to its adaptability is the sprouting of a number of tufts from a pile of blanket weed which I pitched out by the poolside when doing the rounds this summer. So its value submerged is equalled by its attraction above the surface. All in all I must give this full marks for beauty and for staying power, and I intend to experiment with it still further.

Colin Roe's *Manual of Aquarium Plants* lists it as *Crassula* (or *Tillaea*) *intricata* with an Australian origin, and de Wit remarks on its uniqueness as a submerged succulent. Both confirm my experience of its partiality for cool conditions but perhaps a gradual transition to warmer waters has not been exploited fully. If this particular variety does stem from the Antipodes its frost resistance is quite remarkable, but then we did learn quite a lot about all this last January, when most of the books on plant survivability were found to require heavy revision! The main needs which communicated themselves to me were that the roots needed to be in mud or loam, and that there should be reasonable access to ordinary daylight. Some extended trials with this unusual and extremely useful plant are called for, and I hope that readers will report on their own experiences in due course.

From a Naturalist's Notebook

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developed recently at Stirling against vibriosis is to be launched by Burroughs Wellcome.

Vaccinating many fish with a syringe presents labour problems, so a high level exposure technique is being developed, making use of osmosis; also high pressure spraying with very high concentrations of the new vaccine. Much of Prof Roberts' work has been with lemon sharks, the commonest in public aquaria.

Norway Lobsters

Marine life also received much attention and C. J. Chapman, Torry Marine Laboratory's principal scientific officer, described Scottish research with underwater TV on the Norway lobster or scampi which burrows only in soft mud-beds. Its time of emergence to feed varies with depth (and light), from nocturnal in shallow (30m) water to daytime activity in deep water (100m-500m or more). At intermediate depths it has two activity peaks, at dawn and dusk. This explains the variation in fishermen's catches. Despite its economic importance, little is known of its ecology and behaviour, he said. That Norway lobsters do dig burrows in mud was finally confirmed in aquarium observations. Then a population was found in Loch Torridon, shallow enough for diving studies. In addition to Norway lobsters, Fries' goby and crabs, Goneplax rhomboides, and another crustacean, Calocaris macandreae, also made burrows in the mud there. Burrows were mapped, labelled and their occupants tagged, revealing they change burrows frequently, often fighting over them. By pouring polyester into burrow entrances, their simple structure was revealed, with 2 or 3 openings. Occasionally more complex ones were found with smaller, multi-branched tunnels occupied by a juvenile, possibly when first settling down from its drifting planktonic stage, when it enters an adult burrow to escape predatory fish. There it stays without emerging for the first year.

Dr. I. G. Priede of Aberdeen University's zootelemetry research lab had some interesting results of monitoring wild fish with an electronic telemetry acoustic transmitter used like an aeroplane's flight-recorder, to record swimming speed, heart-beat, temperature, etc., that enable a fish to survive through the "stress spectrum". A radio beacon attached to a 25ft. basking shark was tracked through a receiver on a US/French satellite in orbit above the Earth.

Sitting in a dinghy in the Ribble estuary, he was able to track the movements of a salmon fitted (under anaesthetic) with a telemetric transmitter. Elsewhere he found brown trout heart-beats are slow at night and regular, but increases at dawn with feeding activity, anticipating the sun by ¼ hour. Through the year it is linked closely to dawn and dusk. Brown trout are territorial, occupying favoured areas of a loch. Put into the wrong part of the loch, one's heart-rate remained high 2½ days, until it found its own place. The typical mortality rate of adult fish in the wild is about 1 in 1,000 per day.

'Things they say' *contributed by Graham Cox*

"LOST. Brown and black dog, has pie-balled left eye and limps, got half of right ear missing and no tail. Answers to the name of Lucky".

Huddersfield Examiner

FOUR SPECIES OF FUNDULUS

Notes on their behaviour

By Anthony C Terceira, PhD

THE genus *Fundulus,* native to the United States, comprises some 26-30 species depending upon interpretation. All species are seasonal spawners which require a cooling period to imitate the natural environment within the United States. In spite of the many similarities within the genus, their reproductive behaviour can differ markedly as will be shown.

Fundulus notatus (Rafinesque, 1820) the Black stripe topminnow. This species is found on the Gulf Slope, from Mobile Bay drainage in western Alabama to San Antonio Bay drainage, Texas; Mississippi Valley continuing north to Iowa and southern Wisconsin. It is also found in Lake Michigan and Lake Erie drainages from Wisconsin to Ohio and Ontario.

In the natural habitat it prefers small to large, lowland, low-gradient streams and sloughs having water of moderate to high turbidity. It usually feeds at the surface from late morning to early evening. Terrestrial insects comprise 50% of the natural diet. The spawning period is generally during the months of May and August unless the weather is extremely cool in which case only one spawning period may be possible in the natural environment.

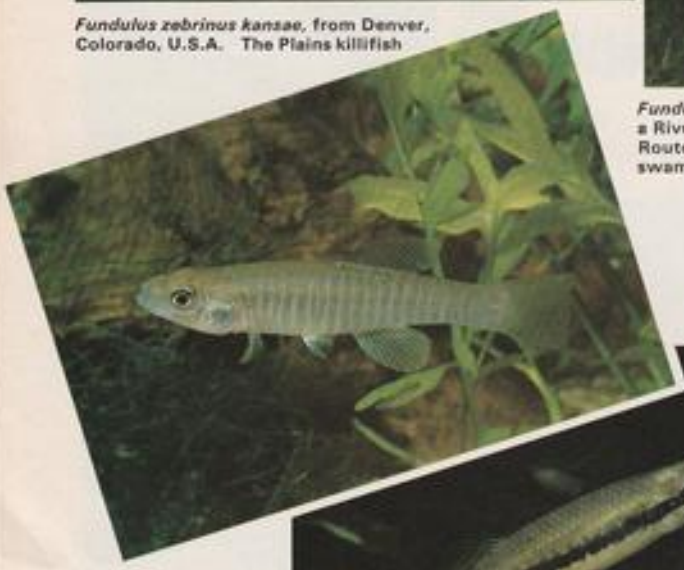
In the home aquaria the fish will readily accept most prepared and live foods. A good diet of live and frozen foods along with a rise and fall in temperature will induce these fish to spawn. Providing a slow rise in temperature in the spring of the year will bring about increased activity and the males will tend to darken and the bold black stripe will appear most pronounced. Eggs are deposited singly in floating plants or among roots and will hatch in 10-14 days; the young are large and easily able to consume newly-hatched brine shrimp.

Fundulus zebrinus kansae, Garman. The Plains Killifish. Originally described as a full species, this fish was placed as a subspecies of the earlier described *F. zebrinus* by Drew in 1967. It ranges from South Dakota and Wyoming south to Arkansas River in New Mexico and the Red River in northern Texas. The fish illustrated was collected in Denver, Colorado in a stream which was 9 to 36 cm in depth. The stream's bottom was composed of small rocks and fine sand. There was little vegetation present within the stream, although the stream's edge consisted of grasses and other small deciduous plants. In June, July and August the temperature ranges from 22 to 26°C. During the winter months ice will form over the quieter parts of the stream. They spawn in small brooks and streams over a sand gravel bottom and have been observed burying themselves when frightened. Also the eggs are deposited in the bottom in the spaces in the gravel.

An aquarium of 38 litres is adequate for a small pair of fish, but since they will reach 16 cm in total length, adults should be provided with a larger aquaria which is covered with gravel. A few eggs may be observed in the upper strata if plant roots are provided, but the majority of the eggs will be laid within the gravel bottom, when the temperature begins to rise. Adult males show red to orange on all of the unpaired fins during the spring spawning season and are a most beautiful sight. They must be well-fed and will readily consume all aquarium food although they seem to enjoy frozen adult brine shrimp above all other foods.

Fundulus zebrinus kansae, from Denver, Colorado, U.S.A. The Plains killifish

Fundulus chrysotus, the Golden ear Killie, Collected from a River which passes St. Georges and Fargo, Georgia off Route 94 along the southern end of the Okefenokee swamp U.S.A.



Fundulus diaphanus diaphanus collected in Gorton's Pond, Warwick, Rhode Island along Route 5, U.S.A., water depth 8 cm. The banded killifish

Fundulus notatus from the Mississippi drainage area in the state of Kansas, U.S.A. The black striped topminnow

To raise the young fish I generally remove the adults when the female appears depleted of roe and then lower the depth of the water to 12cm. Young fish will begin appearing within 12 days and may be raised on newly hatched baby brine immediately. Growth is rapid provided adequate space is available. The Plains killifish is most interesting in the home aquarium because of its habit of burying itself under the gravel. This is one of the few species which exhibit this behaviour and certain adjustments must be made in the aquarium to insure adequate depth is provided for the burying habits of the species.

Fundulus cingulatus Valenciennes 1846, The Banded Topminnow. It is hard to believe that for some time there was confusion concerning this fish and its nearest relative,

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Four species of Fundulus

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F. chrysotus, The Golden Topminnow. To the aquarist and anyone else who views the two species they are very different, but good photographs and illustrations were not available in the mid-19th century. The vivid golden spots which adorn *F. chrysotus* do not appear on *F. cingulatus* at all. Also on the opercle is a bright gold iridescent spot which is not present on *F. cingulatus* and gives rise to the common name for *F. chrysotus* of "Golden ear." *F. cingulatus* exhibits 12 or more dark maroon bars on the side and during the breeding season the lower half of the head will become almost completely black.

F. cingulatus is confined to the Florida area, where it will be found as far south as the Tamiami Canal. It also occurs in extreme southeastern Georgia in the St. Mary's and Satilla River drainage system. It may range west nearly to the lower Mobile Bay area of Alabama. It is found inhabiting the backwater areas of sluggish lowland streams, swamps and marshes, often in association with very extensive aquatic vegetation. The fish will generally be found feeding on the bottom. The frequent ephemeral nature of their habitat suggests that the eggs may often survive and develop in dry substrate as is true of many of the other cyprinodontid species, most notable being the annual killifish of the genus *Nothobranchius* from the East African Plains region.

In the home aquarium these fish should be maintained in a darkened environment where they will exhibit their best colours, also some form of spawning media should be provided at the bottom of the tank. I have used peat moss and Java moss with equally good results. It is most interesting to watch the spawning behaviour of this particular species because of the similarities between the Old and New World killifish. Here we have a fish which behaves much like the exciting African annual fishes. The eggs need not be dried, but will rather develop and hatch within 12 days and the young again are quite easy to raise.

Fundulus diaphanus diaphanus (Le Seur, 1817). This species occurs from Coastal South Carolina north to the Maritime Provinces and Newfoundland. Generally the more western inland forms are given the subspecific name *F. diaphanus menona* and there have been rare reports of hybridization with *F. heteroclitus* (Hubbs et al. 1943). When the two subspecies are viewed together the distribution may be extended more westerly with an area of intergradation occurring in Western New York and within the eastern Ontario drainage system.

These fish prefer quiet water of lakes, ponds and streams with sandy bottoms. In early spring the fish will head to the shallows of the pond's edges and eggs will be laid in clusters among the rooted vegetation. Eggs have hair-like filaments which will attach themselves to the vegetation and there the eggs will stay until they hatch in approximately 14 days. Because these fish are restricted to the colder areas, they generally exhibit only one protracted spawning period in the spring. The water becomes too cold in early fall for spawning to occur.

In the home these fish should be maintained where the temperature will fluctuate so as to imitate the natural environment, and allow the females to fill with roe. If the temperature is not allowed to fluctuate the females will not develop eggs and spawning will be hindered. It is assumed that the changes in temperature trigger the female to produce eggs. Eggs will be laid in floating plants or a "spawning mop" and will develop in the same time as in nature. Young of all species of *Fundulus* are able to consume live baby brine shrimp and are little trouble to rear in the home. The most difficult task for the aquarist is to provide the temperature changes and proper diet to bring these fish into spawning condition during the early spring.

We have chosen to look at four different breeding behaviours of *Fundulus:* the single egg which is the habit of *F. notatus;* the use of the gravel substrate which is typical of *F. zeb. kansae;* the bottom spawning characteristics of *F. cingulatus;* and the spawning of eggs in clusters which is represented herein by *F. diaphanus diaphanus*. It is probably safe to say that these are the four methods used by all members of the genus and most seem to lay their eggs singly within the vegetation's root system. By learning about the different habitats and behaviour of these four members of the genus hopefully all fish of the genus will be able to be successfully reproduced within the home aquaria.

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ACROSS THE COUNTER

BY BARRY DURHAM

Algarde

ALGARDE have brought out a plastic airlift cover that is contoured and printed to look like a branch or thin tree trunk.

I can't say that I like it. But then I always did prefer to have plenty of plants in my tanks so you never saw the air-lifts anyway. However, if you are the sort of aquarist who prefers a ratio of six fish to each plant then this could solve one of your equipment camouflage problems. Once it gets some algae on it, it will probably look quite life-like.

I was much more impressed with their 'Longlife Aerator'. A small plastic 'airstone' built up from half a dozen rings locked on to a central hollow pillar. Each ring has a rough and smooth side to allow the passage of tiny air bubbles between them.

It has worked very well up to now and has been as easy to clean as Algarde claimed.

Plants from Denmark

After spending a couple of weeks hiking round the aquarium shops searching out the plants I wanted for my new set-up, guess what happened? The morning after the night before spent up to my elbows in the tank, a parcel arrived. That's right, a specimen set of plants which are now being imported from Denmark by R. J. Cook Ltd., of West Bromwich, for distribution in the U.K.

Despite their ordeal, the plants were in excellent condition and were well packed for travelling by post. I confess to being no expert on plant identification, but from the well illustrated catalogue it would appear that they were four species of Echinodorus or Amazon Sword plant and a beautiful deep-red-leaved Hygrophila.

They have all settled down, after the loss of a few leaves, which is expected after transplanting, and are now all thriving. The freshness and hardiness of the plants is apparently maintained by growing them in containers in rock wool (that's how they arrived with me as well) and then shipping them to England on a regular basis.

R. J. Cook are distributing them in the South of England and the Midlands, while the North is being covered by Elkana of Meol's Cop Road, Southport.

If you can find out which shops get them in your area, they would be worth searching out because, although I suspect they may cost a little more than the average pet shop specimen, the quality should be well worth paying for.

Internal Power Filter

The Fluval 51 internal power filter now comes with adjustable flow which means that you needn't have your fish swimming constantly against the current! But seriously, folks, this triangular unit which will fit into a corner of the tank can now be adjusted to have a turnover of up to 480 litres per hour which should be sufficient to keep most tanks sparkling.

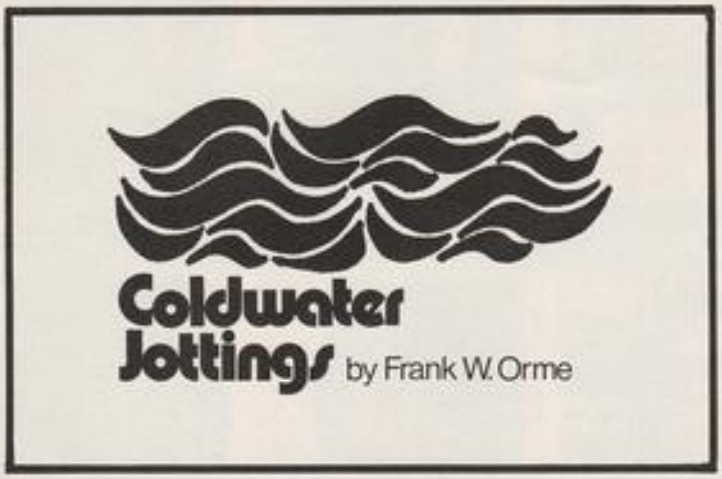
One of these units has been operating in my three foot tank for some weeks now and it keeps the water crystal clear on just one to two hours use a day. I don't find it necessary to have the pump on continuously, despite the fact that it is pretty quiet in operation. I also prefer to use it with the spray bar attachment which, although it is an optional extra (at a cost of about £1·50), provides a more diffuse return of filtered water and does lessen the 'mountain stream' effect which tends to occur if the pump is used full blast through the short outlet pipe.

The sealed pump motor fits easily onto the body of the unit which houses the coarse sponge filter, which is very effective and easily cleaned by simply rinsing under the tap. In fact, all the replaceable parts can be got at with ease.

It is also possible to fit the pump to an undergravel filter by use of the adaptor supplied, but of course this would necessitate it being used continuously for the under gravel filter to function properly.

It is an effective unit but I did find that the new flow adjuster attachment didn't fit as snugly as it might, with the result that some flow always appeared to be directed upwards through the leak, especially when the main flow was greatly reduced by the adjuster.

Price in the shops is around £25 so it isn't a cheap alternative to the simple undergravel or box filter—but it is a very effective and more efficient alternative.



OVER recent months it has been mentioned to me that the cost of petrol may well limit the number of exhibitors to the various open shows. Those who have expressed this view believe that unless there is a drastic upturn in the financial conditions of many fish keepers, the expense of travelling any distance to visit a show could prevent them attending, and so be denied this pleasure. A gloomy prospect; however, some have already had to give up and restrict their visits to the more local events. As one man remarked, "when you are unemployed, and have a family to look after, fish shows come rather low in the order of priorities."

Sharing expenses by travelling in a group is one way to help overcome the difficulty and a number of societies now arrange coach parties to the larger shows. In this way the expense can be spread over a period of time by making small, regular payments towards the cost.

Open Show

The Northern Goldfish and Pondkeepers Society Newsletter, of August, contained a report of their annual open show. Held earlier in the month at Bolton, Lancashire, they attracted exhibitors and visitors from as far afield as Bristol and Scotland—both areas being rewarded by gaining places in the awards. More locally, the general public was attracted by the offer of a fish to each of the first 500 children to pass through the doors of the show hall. This offer was well advertised in the local press before the show, and the inducement resulted in a very satisfactory increase in the number of visitors. Hopefully, it will also encourage some of the youngsters to become seriously interested in the hobby, and become junior members of the society. Young fish keeping enthusiasts are the future lifeblood of our hobby, and deserve to be encouraged by all societies.

The various classes were well supported and most of the goldfish varieties were represented; however, it was the Bristol shubunkins which gained the premier awards, Best Fish in Show going to Mr. Brian Rothwell of the N.G.P.S., and Mr. Vic Cole of the Bristol Aquarists' Society taking the Aquarian Trophy for the Best Breeders Team.

Should goldfish keepers form themselves into one-variety societies? Mr. Frank Hilton, a member of the Ranchu Society, during a telephone conversation with me, expressed the opinion that they should. He believes that the future of the coldwater fish-keeping hobby lies in this direction and that koi enthusiasts and his own society are pointing the way. If societies were established which catered for a single variety, be it the Bristol shubunkin, moor or veiltail or other variety, so that the members could devote their concentrated efforts in a united endeavour to improve their chosen variety, he considers it would bring a great long-term benefit to both the fish and the hobby. In addition to these specialist societies, he thinks there should be a single national body to promote and further the interests of coldwater fish keepers—but that, at least for the time being, it should steer clear of the thorny problem of unifying show standards for goldfish.

Certainly there is much to be said in favour of the specialist society. It allows the members to fully investigate and learn about the fish which has their common interest and, by sharing stock and working together upon a breeding programme, it is possible to learn a great deal and speed up the process of producing any desired improvements in the stock. There can be little doubt that British devotees of the koi have reaped much benefit by sharing a common interest, freely exchanging information and knowledge with each other, and generally helping one another to understand the requirements of this fish.

The majority of goldfish fanciers, however, are interested in, and keep,

Coldwater Jottings

more than one variety—only a comparatively small number are willing to specialise in one variety only—and such a society would be unlikely to appeal to them. In fact it would seem safe to assume that there are more non-society goldfish keepers than there are those who do belong to a society—let-alone a society which caters solely for goldfish enthusiasts. Why this should be is difficult to understand, unless it is that the person who is interested in the coldwater side of the hobby is more independent than others and prefers to 'go it alone', but the fact remains that pure goldfish societies are very much in the minority.

Possibly, before considering setting up specialist one-variety societies, efforts should be made to create a greater interest in establishing goldfish societies in those areas which do not have the benefit of such a group. What do readers think? It would certainly be interesting to learn the views of that vast number of goldfish enthusiasts who do not belong to a society—especially their reasons for preferring to remain unattached.

Strange Folk

Over the years that I have kept goldfish I, like many others, have encountered some strange folk, and my mind was set upon this train of thought by a letter from Mr. Bill Ramsden, who is the president of the Northern Goldfish and Pondkeepers Society, in which he wrote that he could recount a number of amusing stories about some of the people he had met, and different things which had happened.

I recall many years ago visiting a breeder of goldfish who lived some distance away. Upon arriving I was cautioned to be careful where I put my feet. It was a very necessary warning as I discovered for the hall floor was covered by a number of small, shallow pools; around the walls were aquariums, and water appeared to have been slopped everywhere. The same treatment had been applied to the lounge, dining room and kitchen —whether the accommodation on the upper floor was similar I cannot say, but it probably was. Outside there were more pools, a large glazed fish-house, and the garage which had also been converted into fish-keeping accommodation—the car had been ejected to the roadway in front of the house. It must be said that this elderly man had some first class fish on display, and obviously took great care of them. That keeping fancy goldfish had become more than a hobby was quite apparent—it had become a mania—and it therefore came as no surprise when he said that his wife had left him, because he insisted upon bringing his fish into the house, which he thought most unreasonable!

Most wives are quite understanding, and will tolerate attractive aquariums in the home in moderation, but few, I feel, would be willing to sanction a complete take-over. Certainly I can well remember my own wife making a rather acid comment, after we had taken our leave, which indirectly warned me of the consequences if I ever allowed myself to follow his example—but I have never had an inclination to go to such extremes of fish-keeping.

As this is the last month of the year I will finish by wishing all readers a very pleasant Christmas and a successful and enjoyable season of fish-keeping in the coming new year.

B.K.K.S.

As an original member of The British Koi-Keepers' Society, it is most gratifying to record that a membership of over 2,000 had been achieved by September 1982.

The Society was formed in 1970 through the good offices of our late founder and President, Mr. Ken Fawcett, who set the right course of a friendly, amateur, Koi-keeping society; the first of its kind in the U.K.

Beginning with a Newsletter there has, since 1975, been regular monthly magazines written by Koi-keepers for Koi-keepers and of general support to all levels of the hobby.

More than a dozen local area groups meet monthly for discussion between those with a shared interest, and both national and local Koi-shows are held annually during the summer months.

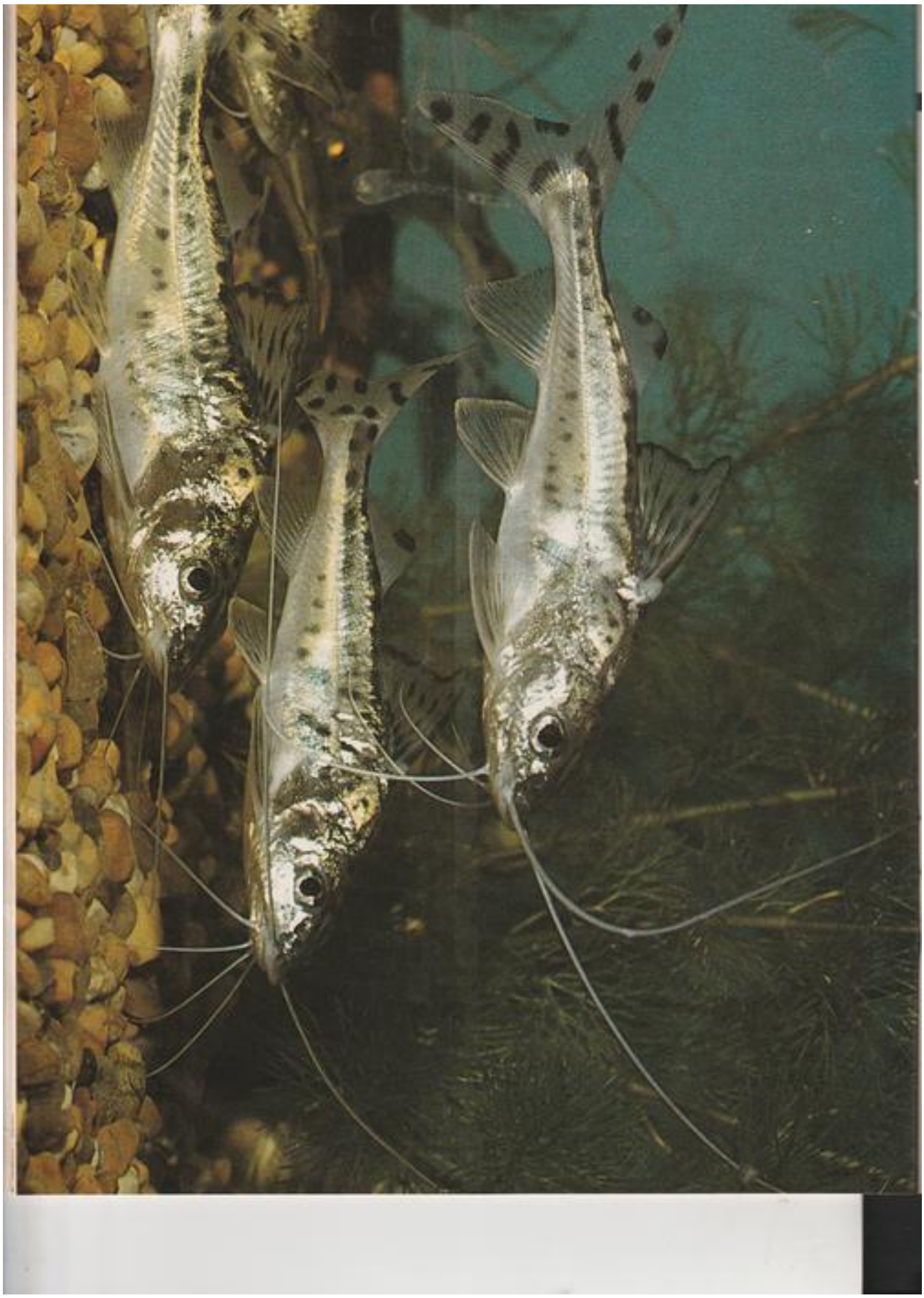
The Society has been fortunate in having members prepared to work for it, purely for the honour and pleasure of doing so and always as amateur fish-keepers.

Koi have a special fascination and being delightful fish to keep, therein may lie part of the secret of the success story of the B.K.K.S.

The co-operation and support of *The Aquarist and Pondkeeper* and its Editor, Mr. L. E. Perkins, through the years is gratefully acknowledged, also the friendly association with The Goldfish Society of Great Britain and The Federation of British Aquatic Societies.

The B.K.K.S. is the largest Koi-keeping Society outside Japan, sustained by amateur Koi-keepers, it welcomes newcomers and full details of membership are available by sending an S.A.E. to: The British Koi-keepers' Society (AP), 2, Horncastle Road, Moston, Manchester M10 9GT.

Hilda Allen



SPOTLIGHT

PIMELODUS PICTUS

by Jack Hems

Whilst researching this feature on *Pimelodus pictus* I soon realised why my mail bag over the years has included many queries on this catfish. It seems strange, when one considers just how popular the 'angelica pim' is with aquarists, that commercial publications rarely mention it. The loose leaf system of the Tropical Fish Hobbyist provides an information sheet on *Pimelodella pictus*, the scientific label attributed to Mueller and Troschel (without a date for the original description) I can only assume the T.F.H. writer at that time confused this catfish with *Pimelodella cristata* (Muller and Troschel) 1848, a much confused Pimelodontid both in scientific and hobbyist literature.

Stendachner's specimens are said to have originated from the Peruvian Amazon, Hyavary, but Dr. Axelrod in March 1965 T.F.H. described his expedition in which a spotted silver catfish was collected in the region of Mitu, Columbia.

The last decade has seen the import of hundreds of thousands of these extremely attractive catfish and its popularity ranking must now be next to *Corydoras* in the Aquarist world. They are described as 'Angelica Pims' because they represent the negative pattern of a rare African catfish, *Synodontis angelicus* its coloration is a jet black body splashed with white spots. The colour pattern in *Pimelodus pictus* can vary a great deal between adult and juvenile, some showing very little spotting on the body, whilst others are so liberally spotted the markings almost run into a maze of lines.

One of the major reasons for this species' rise in popularity is most certainly that juveniles and adults in groups do not hide away as with most of the other members of the family *Pimdodontidae*—the silvery body continually swimming across the foreground of an aquarium making an attractive picture.

They are naked, or scaleless fishes and being so, react badly to adverse water conditions or harsh chemical treatment. On initial import they can be prone to white spot, fungal infection and harsh pH changes. An aquarium which has neutral to alkaline conditions, well aerated, would suit them best. Beware of badly netted specimens—these catfish spread pectoral and dorsal spines into a locked position, the serrated edges jamming into the net. If they are not removed with great care, the damage done to the operculum, pectoral region can be fatal. A specimen reacting to an abrupt pH change will have reduced barbels; a normal healthy fish will have long outspread barbels half its body length, so look carefully and do *not* purchase a damaged fish.

T.F.H. suggests *Pimelodus pictus* are not predatory—this is not true, *all* Pimelodontids are predatory and *P. pictus* enjoy small tetras, etc. when night falls.

They can attain an overall length of about 5 in. so I would recommend them for a community aquarium containing larger fishes such as barbs, gouramis, cichlids and other South American catfish.

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1890 Eigenmann (CH) & Eigenmann R.S. Proc. California academy of sciences. Vol 1 a revision of the South American Nematognathi or catfish 1 1- 508.

1974 Mees, G.F. The Auchenipteridae and Pimelodidae of Surinam (zoologische verhandelingen) zool. verh. 132 130-182.

Your questions answered...

TROPICAL

Dr. C. Andrews

COLDWATER

Arthur Boarder

Tropical

troublesome tigers! . . .

I have recently set up a 36 in. × 12 in. × 15 in. tropical community tank. One of my fish is a tiger barb and it often chases and nips the fins of other fish in the tank. What can I do?

Adding another four or five tigers should prevent this problem—they are a shoaling fish and like the company of other tiger barbs. Ensuring the tank is well planted will also help.

silver arowana . . .

I have seen a silver arowana in a local dealers shop. Can you tell me something about this fish?

The silver arowana (*Osteoglossum bicirrhosum*) is a rather unusual fish which comes from northern South America. In an effort to try and conserve this fish, one or two countries have banned its exportation. They must be kept in a large tank (they can grow to a metre long!) with good filtration and regular partial water changes. In the wild they inhabit quiet, weedy backwaters. Do make sure your aquarium (if you buy the fish!) has a good lid—an arowana is a good jumper! I also understand that this fish can bite. The arowana is a mouthbrooder, but it is not often bred in the aquarium. I suggest you keep it in a species tank and try feeding it on 'wormy' live foods, lean, scraped raw meat and foodsticks and tablet foods.

cardinal requirements . . .

What are the best conditions (particularly water quality) for cardinal tetras?

Cardinal tetras prefer soft GH less than 5°DH, KH less than 3°DH), acid (pH 6·0-7·0), "blackwater" conditions. A temperature of 23-24°C will suit them fine. Feed a good mixed diet and provide a well planted

Cardinal Tetra

tank. Carry out regular, partial water changes. They are, of course, shoaling fish.

starting up . . .

Can you send me some information on setting up a community tank for tropical fish?

It is impossible for me to deal with this query in a short letter, and hence I have enclosed our information pack which I think you will find useful.

What I will say is that you should try to find out as much about the hobby as you can *before* you set up a fish tank.

A book like "Aquariums" by A. Evans (Foyles, £1·50) is inexpensive and very useful.

Do drop me a line if you have any more precise questions.

blue acara . . .

Can you give me some information on the care of the blue acara?

This fish likes quite a large tank, which it will share with other similar sized cichlids. It may grub about and disturb the tank bottom and needs one or two caves to hide in. It is not especially fussy over pH and water hardness—although regular partial water changes are important. A temperature of 20-25°C is fine. It is easy to breed and feed in the aquarium.

C.A.

Coldwater

breeding . . .

I would like to breed Perch, Roach and Carp. Can you tell me where I can get some of these fish and how to breed them? Also where shall I be able to sell the youngsters I breed?

The Perch and Roach are not fishes to be found at the usual pet shop. The Perch, being carnivorous is not welcomed by pondkeepers as it could eat the other inhabitants. The Roach is also not often stocked as the Rudd is usually preferred. As for being able to dispose of your youngsters I do not think that you will find a ready market, except perhaps for Carp. If you have the space to breed a number of fishes, why not concentrate on types which could find a ready market? The types I have in mind are: Golden Orfe, Golden Rudd and Golden Tench.

To breed any of these fishes you will need plenty of swimming space as young fishes will not thrive unless they have sufficient room in which to grow. A supplier's address is enclosed.

cleaning . . .

I cleaned my pond out in late autumn; will it need cleaning out again after the winter?

Your pond should not need to be cleaned out again in the early spring. The fishes will have been inactive and fed very little, if any, and so there should be very little mulm to clear from the pond. However, it is a very good plan to change most of the water for fresh. This is especially

PLANTS

Vivian De Thabrew

KOI

Hilda Allen

MARINE

Richard Sankey

DISCUS

Eberhard Schulze

Our experts are always pleased to receive your letters which should be addressed to: **Readers Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex TW8 8BN.** All queries must be accompanied by a S.A.E.

important if the pond has been frozen over for some time during the winter. A change of water in the spring will encourage the fishes to spawn.

wooden statue . . .

I have a wooden statue which I wish to place in the centre of my pond on a plinth. It has been treated with linseed oil and is rather old. Will it harm the fishes and can I make it safe?

You can clean the statue well, give it an undercoat and then a coat of hard gloss paint. Sponge it down when dry and it should be safe. You must realise that this will make a very convenient perch for marauding birds, especially kingfishers, as they like a perch from which they can spot and dive for a fish. Also birds can settle on it and their droppings can be washed into the water by rain. I suggest that you place the statue a couple of feet from the pond on the side away from the house and you may get a good reflection in the water.

golden orfe . . .

I have a golden orfe in my pond and it is about eight inches long. It has had a lump on its side for some time and I wonder what it is and what I should do about it?

The lump appears to be a cyst and as it does not seem to be inflamed, there is little that you can do about it. It may not trouble the fish and may not alter in size. Should it become inflamed and burst it can then be treated. Hold the fish in a wet cloth, press out any pus and then dab the wound with neat T.C.P. on a swab. Return to water but not with other fishes. The treatment may have to be repeated and then with a weaker solution of T.C.P.

gravel . . .

I am setting up a tank, 24 in. × 12 in. × 12 in., and would like to know how much gravel to put in the base and any other information you can give me?

Do not use gravel as small stones could get stuck in the mouth of a fish. Use washed river grit, as gardeners use in potting composts. Very fine sand is no use as it can pack down too tightly. Have about an inch and a half at the back sloping down to almost nothing at the front. This will mean that uneaten food and fish droppings will be washed to the front of the tank where they can be siphoned out easily. Keep the front third of the tank free of plants and a little rock-work will help to break up the flatness of the base. Try to build a small platform at one end with flatish pieces of stone-work. Shade out the back and ends with aluminium paper, have a hood with a lamp and you should be able to create a good living picture.

mussels . . .

I have read that freshwater mussels will keep the water in a fish tank clear. Where can I get some?

I have enclosed an address from where you should be able to get the mussels. However, you must realise that they will not live long in gravel but must have at least half an inch of mud or very fine sand. Otherwise they cannot move about and would soon die. A dead mussel may not be noticed in a tank before it has rotted and polluted the water. Also, should the mussels breed, at a final stage in the development of the young ones, they spend this time as parasites on fishes, which could cause harm to the fish.

orfe fatality . . .

One night recently we had a violent rainstorm and in the morning I found my two, ten year old orfe dead on the surface of the pond. I understand that thunder might have killed them but I heard no thunder that night. Can you explain their deaths?

It is probable that the air was very close due to thundery conditions. The water in the pond will then lose much of its oxygen. Orfe need a lot of this and the larger the fish the sooner are they in trouble. Some years ago I came home soon after 6 a.m., after a bad storm. I found my six medium sized orfe on the surface dead or dying. I rushed them under the tap and managed to get three back to life, but the others were dead. I am sure that if I had not found them when I did, all would have died. When thunder is expected at night, play the hose on the pond during late evening as this could save losses. Usually other fish in the pond, such as goldfish are unaffected. **A.B.**

Plants

dimethylurea calcinate . . .

I have recently bought a pond block. It is stated on the wrapper that it contains Dimethylurea calcinate—'May damage susceptible plants.' Have you any comments on this or suggestions as to the types of plant it could harm?

Dimethylurea calcinate, according to my opinion, only affects plants with tissue-like leaves. Therefore species like Potamogeton and *Nuphar pumilum* would be affected. The usual pond

plants should not be affected. The effect of such chemicals is fairly temporary, manifesting itself in the scorching of the leaves, or in some extreme cases, stunting the plant itself.

how tall a tank? . . .

Is 18 ins. just right for plant growth (light penetration). Is 24 ins. too deep?

A tank depth of 18 or 24 ins. is satisfactory. In a 24 in. deep tank you can grow some of the tall plants. As for lighting, you will need to consider the light penetration factor. The solution here would be to use light of greater intensity than is required for an 18 in. deep tank. Therefore when selecting plants you should pay particular attention to their light requirement.

V.T.

Koi

temporary tank . . .

Can you please supply the address where I can obtain round or oblong containers to temporarily accommodate my Koi?

As you live at least a hundred miles from me the answer must be 'NO.' A wide variety of suitable containers have been used for this purpose including household water-storage tanks, large plastic dustbins, cold frames with polythene liners, children's paddling pools, etc. etc. Temporary ponds can be made from strips of hardboard, stapled to form a ring and lined with polythene sheet.

Whatever is used should be sturdy and non-toxic to fish, a covering net is advisable against the fish jumping out or cats causing damage and aeration is usually advisable according to the number and sizes of fish involved.

I hope your Koi will not be kept in shallow water for any longer than is necessary, the nights are already very cold.

thunderstorms . . .

Recently there was a series of thunderstorms locally with much thunder and lightning. During one, when the storm was directly overhead, I noticed something strange in that there appeared to be two large light-coloured fish in the pond. On closer inspection I found two of my Koi were upside down and appeared to be dying. After some time I managed to right them but subsequently these and other fish seem to have lost control of their movements and have bent spines. I would like to know if anyone else has experienced a similar disaster and what caused it.

I am very sorry to hear of your misfortune and whilst such occurrences are not unknown they are comparatively rare.

It would appear that your pond was struck by lightning during a storm and your fish have suffered a serious shock. Lightning produces a heavy electrical discharge which can spread over a wide area at ground level, water especially is an excellent conductor of electricity; even a near flash could result in damage to fish. It is known that during electro-fishing, as practised in commercial fish-farming, fish nearest the probe can be deformed or even killed whilst those farther away are merely stunned and can recover. Also, some fish appear to be more susceptible than others.

Fish are sensitive to noise and vibration but it is not thought that even a loud clap of thunder, muffled through water in any case, would be likely to cause serious problems such as bent spines.

There is sympathy for your problem but none of us can be beyond the whims of nature and so are at risk at all times. I hope for your sake there is some truth in the old adage that "lightning never strikes twice etc. . . ."

H.A.

Marine

quarantine tank . . .

My husband has kept tropicals quite successfully for a couple of years. I favoured Marines but people told us how difficult and expensive they were.

Anyway, we did set up 2 tanks, both 26 in. × 18 in. × 18 in. We let them 'mature' then just put in Malayan Angels, Damsels, etc. When all the tests were clear we moved these fish into one tank and put 2 sea horses in the other which is 'my' tank. I slowly added a striped clown, anemone, small box fish, cleaner wrasse, snails, live corals and 2 more sea horses.

After a while we felt the tanks were not big enough. We already had one 48 in. × 18 in. × 12 in. which previously housed tropicals, so we thoroughly cleaned that and put my sea horses and other fishes into it.

We bought a brand new tank 48 in. × 12 in. × 12 in. to go inside the stand on the bottom and transferred the contents of the other tank into it. In each case we used the same gravel, coral sand and decorations plus most of the water, filling up with fresh water and sea salt etc. All went very well, if a little exhausting for us! A week later my husband added a tang and an angel fish to his 6 fishes. Three days later we were in trouble. In the space of 2 days all except one original Malayan Angel and a baby mollie had died. There was little warning and tests were clear. There appeared to be no explanation.

Please tell me what I need in order to set up a quaratine tank. Can I use a small 15 in. × 12 in. × 12 in. plastic tank? What do we put it in? I would appreciate as much information as possible because I can't find anything relevant in the 6 expensive books I have! They just say a quarantine tank is a good investment!

Also, the anemone I purchased is a large white 'hairy' monstrosity which is moving, like an elephant, all round the tank. How do I stop it?

Your style of setting up a small aquarium and then converting to a larger aquarium, and having problems is, I am afraid, quite a common one. It is obviously very hard for me to say from a distance what went wrong, but my feeling is that the new aquarium did not have time to stabilize properly, and that there was a surge in ammonia which resulted in the sudden loss of all your fishes. I cannot urge you

enough that time and patience is no substitute, and even though you did move your matured coral sand over, it is not generally a successful method. It really does require the aquarium becoming fully stabilized in its own right. I am sure by now if you had left the aquarium to stand, that any remaining fish would be holding up very well. I can assure you that in most cases there is no need to strip down the aquarium, but some regular small water changes would be an asset.

Regarding your quarantine tank proposal: I must say it is always an excellent idea. Working within the limitations that you have, a plastic aquarium measuring 15 in. × 12 in. × 12 in. would be ideal. The aquarium will obviously need a heater and thermostat, but do make sure that it is of low wattage, otherwise the temperature will fluctuate to such an extent that it may induce further stress on the fish.

Normally I would use no more than a simple inexpensive plastic corner filter, filled with nylon wool and of course driven by an adequate source of air to turn over the aquarium water steadily. To this aquarium I would add new water (or preferably some water from your existing aquarium) each time you introduce a new fish. To the quarantine aquarium I would add a manufacturer's recommended dose of a good quality medication. In this aquarium I would hold your new fish preferably one at a time due to the small size, for between 7-14 days, during which time perhaps two small water changes should be done. Again preferably using water from your main aquarium. Feeding should be light, preferably either live food or a good quality frozen food.

When you feel the fish is fully quarantined, then introduce it to your main aquarium. The water in the quarantine aquarium should be thrown away and the aquarium thoroughly cleaned. Do not attempt to try and keep or re-use the water. This way you have an inexpensive and reasonably reliable quarantine method, and the likelihood of spreading infection to your aquarium will be very small.

R.S.

Discus

discus keeping . . .

I intend to change my present aquarium for Discus. But apart from Discus I would also like to keep a couple of Angel fish, a couple of Gouramies, some Tiger Barbs and Catfish. Will I have any problems with these fish or can you advise me what other kind of fish to have instead. As the temperature of the water will be very high, can you also suggest some plants I can put into the aquarium.

I often wonder why hobbyists who have decided to try to keep Discus must have other species of fish in the same aquarium. Discus fish make, after all, a magnificent show and there is really no need for any other colour or movement. Although there are many photographs showing Discus with Tiger Barbs and other species, I have always felt that the only fish who will suffer after a period of time are the Discus. Angel fish are often kept with Discus but I certainly would not just have a couple of fish but at least 5 or 6. Angel fish, like most cichlids, are great bullies and the stronger one will make the life of the weaker one a nightmare and it will not take too long before it would die. The very same applies to Gouramies. Always keep any species of fish in numbers.

If I were to keep Discus as a community fish I would at least go for fish from South America and a shoal of Cardinal Tetras, *Hemigrammus erythrozonus* (not always available), *Petitella georgiae* or *Hemigrammus rhodostomus* would be my choice. Apart from making a nice show with Discus, they also require the same sort of water conditions and would also be very useful for eating all the small pieces of food the Discus ignore. A shoal of *Apistogramma* could also be kept with Discus fish. Many of the Corydoras Catfish will fit into this kind of set-up as well as a Clown Plecostomus. Another fish which always looks nice in a Discus Community, although from a different part of the world, would be a number of Clown Loaches. Their requirement

Clown Loach — a good companion for your Discus fish

as to water hardness, pH, temperature and food is very similar.

This would be my choice of fish but I am sure you will agree that the choice of aquarium fish is something very personal and I suggest that you spend some time looking through a book and find some species which would fit into this type of aquarium and which might appeal to you more.

The plants for such a tank should only be put into the tank once the Discus have settled in otherwise it is often the case that the Discus will hide in them and hardly ever come out. If Discus have nowhere to hide they usually settle in much quicker and are not shy.

Plants can be put direct into the gravel bed or in pots. I would choose from Echinodoras, Sagittaria, Vallisneria, Wisteria, Crinum and Aponogetons. Plant for the foreground should be Cryptocoryne. All the above mentioned plants have been used in Discus tanks with high water temperatures and grow reasonably well.

E.S.

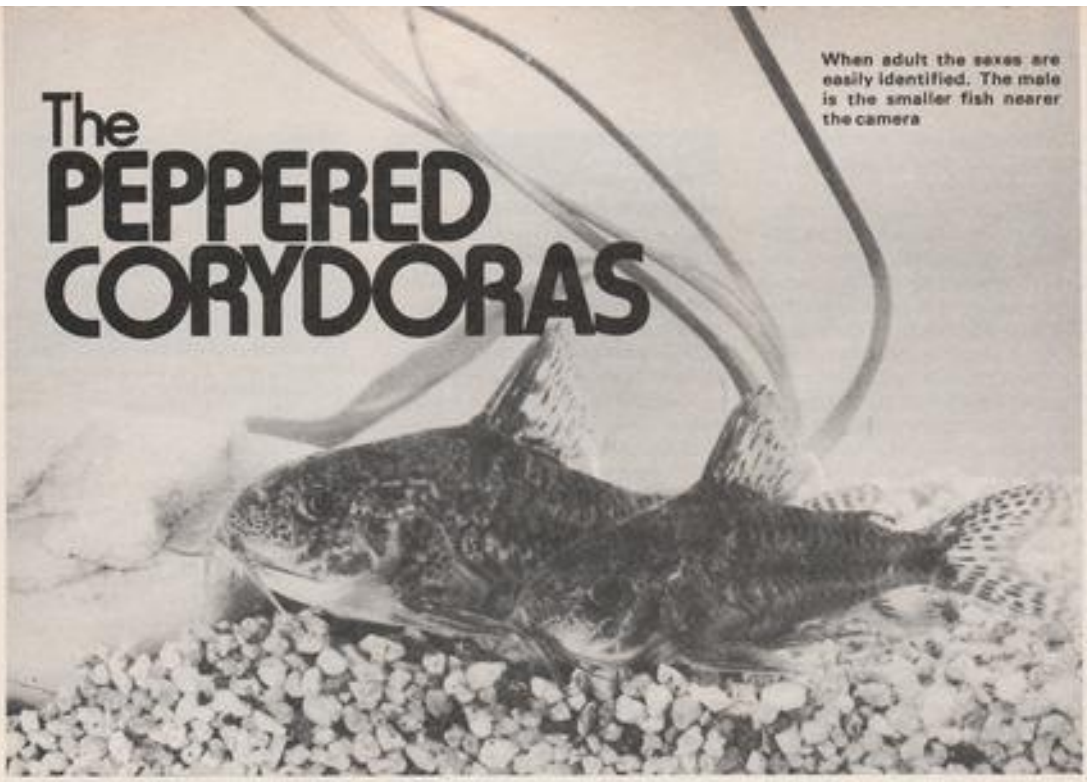
DISCOVER THE FISH

By Pisces—

The first is in COLOUR but not in BRIGHT
The second is in VITAMIN and also in DIET
The third is in CUBIC but not in FEET
The fourth is in WARMTH and also in HEAT
The fifth is in SILVER and also in GOLD
The sixth is in CONFIDENT but not in BOLD
The last is in DISPOSAL and also in SOLD

CICHLID

The PEPPERED CORYDORAS



When adult the sexes are easily identified. The male is the smaller fish nearer the camera

by Karel Rataj

photos by Rudolph Zukal

MANY AQUARISTS cannot imagine life in their aquarium without armoured catfishes. They add life to the tank bottom where they forage ceaselessly for remnants of food and make for an attractive addition to any tank. Nowadays the catfish *Hoplosternum thoracatum* is very popular but these fish grow up to 12cm in size and so the catfishes of the genus *Coydoras* are much more suitable for the small or smaller tank. A large number of them are problem species as far as reproducing in the aquarium is concerned, with two exceptions. These are the species *C. schulzei* and *C. paleatus*. The latter is the subject of this article.

Corydoras paleatus, or the Peppered Corydoras, comes from the waters of the river Parana, which flows through south-east Brazil and northern Argentina. The climate of its native environment is subtropical, so this armoured catfish is not highly dependent on a high temperature being maintained. It will tolerate a drop in temperature down to 15°C, but feels at its best at a temperature of 20-25°C. It is not particularly demanding as far as water quality is concerned either. For keeping and breeding these fish I use ordinary drinking water.

This is a typical bottom fish in having an almost flat abdomen and an arched back. The body tapers and, instead of scales, it is covered with two rows of bony plates. The mouth is equipped with two pairs of barbels. the ground colour is grey-brown with dark flecks. On the sides of the head and body are bright, greenish markings. The male is slimmer and smaller compared to the female. He has sturdier pectoral fins and a higher, more pointed-looking dorsal fin the spine of which stands almost vertical to his back. These catfish grow to 6-8cm. Like all armoured catfishes *C. plaeatus*, too, possesses an auxiliary breathing organ in the rear part of the intestine. As a result the fish occasionally swim to the surface in order to take in air.

The catfish are like many other species in distrusting the efforts of the aquarist aimed at reproduction. In the spawning tank they are shy and lose interest in each other. On the other hand, they often spawn in the community tank. During spawning, three to four males pursue the female, tickle

The female makes a pocket with her pectoral fins into which the eggs are extruded and where they are fertilised by the male

The pocket clearly shown in close-up

her with their barbels and position themselves diagonally in front of her mouth. As soon as the male succeeds in holding the female to him by the barbs, making use of his pectoral fins, he curves his body into an S-shape and extrudes his milt into the pectoral fins of the female. In the same instant, the female extrudes two to five eggs and holds them in the 'pocket' formed by her pectoral fins. The fish part and the female swims to the spot already selected and which has been cleaned shortly beforehand where she deposits the adhesive eggs. It may be a stone, leaf or sheet of glass. Immediately afterwards, spawning takes place again, although the female changes her partner several times, for one male alone is not capable of fertilising all the eggs of a female. Eggs which have been laid in a community tank on glass can be detached with a razor blade or removed along with the whole stone or leaf to which they are adhering and placed in a rearing tank. In the former case I pick up the detached eggs with a glass tube. Losses are much reduced when reproducing the fish in a spawning tank. From one female and two to three males up to 200 eggs, from which the same number of young may ensue.

The female cleaning the site where she will deposit the eggs

These catfish spawn for two to three days and during this period it is necessary to feed them generously so that any impulse to consume their own eggs is removed, although this occurs relatively rarely. At a temperature of 24°C the young hatch after six to seven days. After a further two to three days they are free-swimming. They are relatively large and piebald. Five days after hatching I begin feeding with fine plankton and I illuminate the aquarium from below or from the side so that the food stays at the bottom. The brood can also be fed with detritus which has been drawn from another tank. The young grow relatively quickly and after about three months they are already more than three centimetres in size and have the same colour and body shape as their parents.

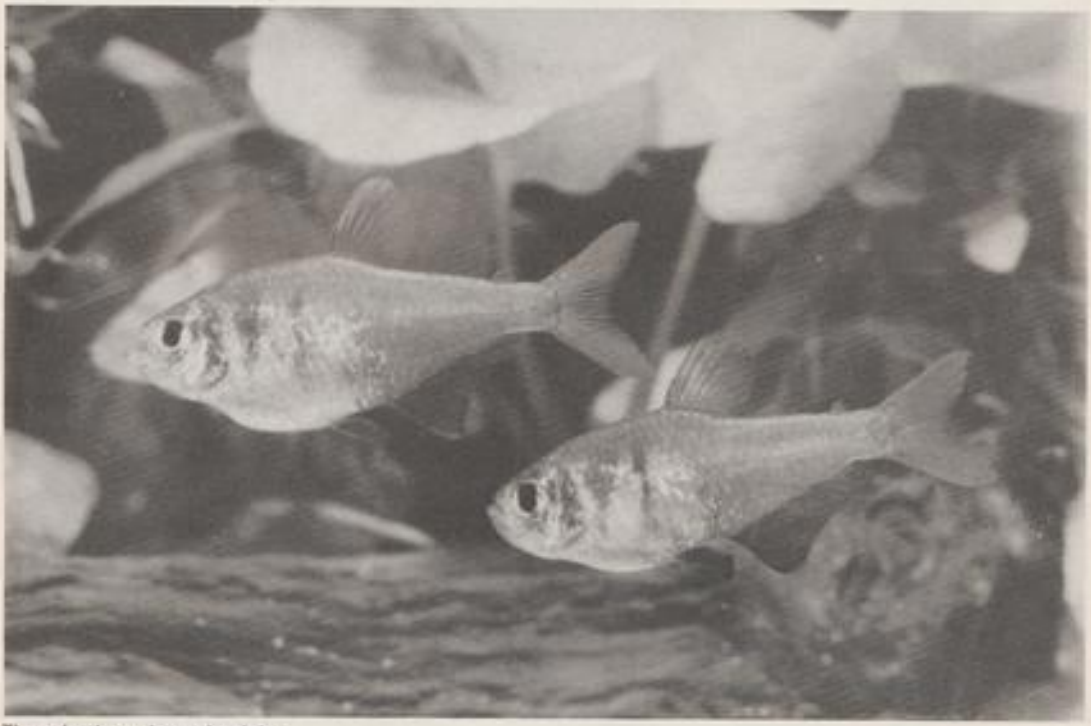
The female, watched by the male, opens her pocket of fins and sticks her eggs against the glass

I have kept these armoured catfish with many other species, even with cichlids, and all the fish have got on together successfully. As these fish constantly disturb the tank bottom in their search for remnants of food, filtration is necessary. Consequently, sand should not be too coarse, otherwise the particles of food fall between the largish grains of sand. The catfish have difficulty in picking them up and, as a result they throw up much more detritus than would otherwise be the case.

I would recommend these attractive catfish to any enthusiast, including newcomers to the hobby.

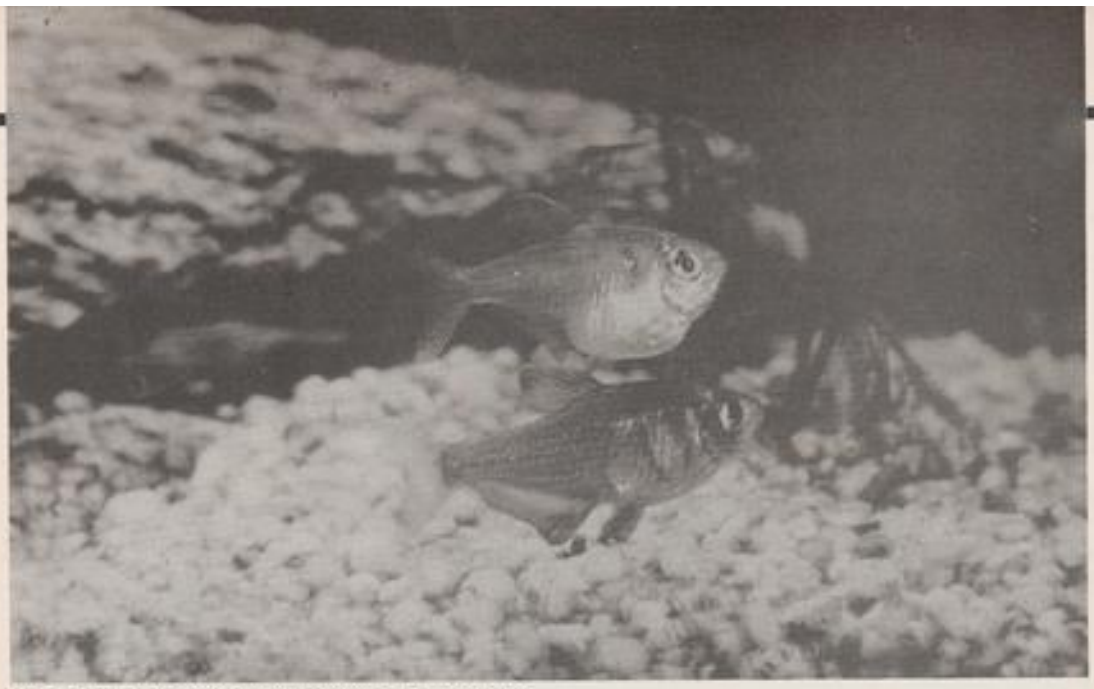
THE UNDEMANDING FLAME TETRA

BY R. Zukal



The pair, the male on the right

It is not always easy and takes some thought to write an article about a species of fish. This is the case here. I would prefer to begin in the following way: "We are concerned with a very attractive tetra, which is an ideal fish for everyone." One could use this sentence with a clear conscience in relation to almost innumerable fish species, or could one? One of our old proverbs runs: enjoyment and a clip on the ear are a different matter. Which means to say that not everyone has the same taste or the same view. One person likes one thing and another something else. Only much later, when one's personal breeding experiences come into the picture, are those fish preferred with which success has been enjoyed. Since I personally in many years of fish-keeping have kept and bred many different fish, it is no easy task for me to pay special attention to one in particular in preference to others. It would be an ideal situation if every hobbyist could have at least ten tanks containing an example of every family. Unfortunately, reality is quite different as most tropical fish hobbyists do not live in sufficiently



During courtship and display behaviour the male's red coloration darkens

The eggs have been extruded and remain hanging from the plants or fall to the bottom

large accommodation and have one to three tanks. In addition, running costs these days are not low. What is one to do in the community tank? Should one go for expensive and attractive fish to make every visitor green with envy? Or choose fish for which good living conditions can be provided? The latter is certainly preferable. The present article should be of interest, too, to any aquarist who wants to keep attractive, peaceful fish which are not fastidious. For the Flame Tetra can certainly be included amongst the latter.

H. flammeus attain a size of about 4cm. In 1920 they were first imported to Europe from the Rio de Janeiro area. They are undemanding and can cope with life in a smallish tank, although they feel more at home in a shoal of their fellows in a large tank. The tank should be well planted and be subject to subdued lighting created by floating plants. The water should be normal drinking water from the tap which has been left to stand, at a temperature of 20°C, a higher temperature being unnecessary. The fish are omnivorous and they can be kept with other peaceable and smaller species. Since they are very well-known fish mentioned in almost every book on fish-keeping, I will omit their description. I would only like to briefly mention the differences between the sexes. The male is smaller and slimmer, his red anal fin is bordered with black. The female is much fuller in the abdomen, larger and paler in coloration.

The fish breed readily and so do not pose the breeder any particular problems. It is an ideal species for anyone who wants to experiment with a free-spawning fish. For breeding a small all-glass tank of 5-10 litres capacity is sufficient, the bottom without sand and planted with fine-leaved plants (*Myriophyllum, Cabomba, Hygrophila*, for example). Normal drinking water (which should not be hard) is left to stand for two days and aerated by an air-pump. If we introduce the pair at a temperature of 24°C and it is a pair consisting of young and healthy fish, it can be expected that the fish will spawn on the following morning. As soon as one has noticed that the fish have spawned they must be removed, otherwise all the eggs will be consumed. The number of eggs is rather big in relation to the body size of the fish and nearly 200 eggs are laid. The young are free-swimming on the sixth or the seventh day. During the first three to four weeks the brood keep themselves near to the bottom of the tank, where they mainly take in their food too. Since they really are very small, they must be offered correspondingly small-sized foodstuff. After about eight months they are already sexually mature.

The different stages in spawning are shown in the photographs. Spawning lasts about two hours and is carried out quite violently.

PRESS RELEASE

THE 1983 'AQUARIAN' CALENDAR SO STUNNING IT DESERVES TO BE FRAMED

Anyone who sees the superb new 1983 'Aquarian' calendar can't help but be impressed by its quality.

The calendar features six superb studies of freshwater tropical and marine fish by Heather Angel—one of the world's foremost photographers of aquatic and wildlife subjects.

The six studies are individually printed on canvas-grained board, within an embossed grey window mount.

Alongside each of the studies there is descriptive text on the species, written by 'Aquarian' consultant John Dawes. The text, along with advice on feeding, also appears on the reverse of each of the studies as a permanent reference.

The 1983 'Aquarian' calendar is a top quality piece, and it will no doubt become a collectors' item in its own right—and at only £1·75 it is an ideal Christmas gift.

Only a limited number of calendars have been produced and demand to date has been great. Anyone wishing to secure a copy are asked to write to 'Aquarian Calendar Offer', Thomas's, Pellon Lane, Halifax, enclosing a cheque made payable to 'Thomas's' for £1·75 and including 2 labels from any 'Aquarian' product.

AQUAMAGIC TO DISTRIBUTE TUNZE PRODUCTS

It was announced in November that the already well-known range of high efficiency Aquarium pumps and filter equipment, manufactured by Tunze Aquarientechnik Gmbh. Western Germany is to be marketed by a different company in the United Kingdom.

For the past two and a half years, Tunze products have been represented by The Tropical Marine Centre Ltd., Boreham Wood, Herts, who have a good reputation for top quality products.

The new company, which has purchased the Tunze agency, is Aquamagic Ltd., Marine House, Market Street, Watford, Herts. WD1 7AN. Telephone: (0923) 39637. Telex: 363340 BALRAWL G. It will be run by Chris and Sue Rawlings, who have been associated with the aquatic trade for a number of years.

DISEASE DIAGNOSIS AND WATER ANALYSIS

by B. Whiteside

MANY YEARS AGO I posted a diseased, dead fish, together with an appropriate fee, to a gentleman who carried out post-mortems on dead fish and issued reports on the cause of death. Recently I discovered that two London-based experts carry out post-mortems on fish, and analyse water samples for aquarists, for what I consider very reasonable fees. I mentioned the service to a member of *The Aquarist* staff. He expressed interest and said that, like me, he knew of no one else, at present, offering such a service. He also reminded me of the possibility of someone offering such a service being contacted by post by ill-informed aquarists sending "quite large numbers of deceased fish in tatty envelopes" and of the embarrassing situation that could develop both for the person offering the P.M. service and for the G.P.O. As he said, "It has happened before!"

In my mind I had visions of envelopes containing dead fish lying in post offices during hot summer week-ends; and of the person offering the P.M. service, complete with gas-mask, opening the envelopes on Monday mornings and extracting the enclosed letters before casting the putrid contents into a bin with a tightly-fitting lid.

To find out more about the diagnosis of diseases in fish and the analysis of aquarium water—and they are closely connected—I decided to visit the two experts at their Fish Diseases Laboratory, at New Eltham, London. I took along my camera to photograph the experts—who are also the laboratory's directors—Jerzy Gawor, B.Sc. (Hons.), M.I.Biol., and Andrew Stagg, B.Sc. (Hons.). As can be seen from the photographs, their laboratory is quite small but well equipped and laid out. The more obvious pieces of laboratory equipment, e.g. binocular microscope and balance, can be seen as well as the very impressive selection of reference books, papers and case histories and a selection of chemicals. Andrew showed me around and explained the workings of the laboratory to me; and, at a later stage, Jerzy answered my questions about post-mortems by post.

"Could dead fish be sent in polythene bags in ordinary envelopes?" I asked Jerzy.

"Fish in envelopes? Forget it!" he replied. "Some work, mainly of a histopathological nature, can be conducted on fish preserved in 40% formalin. Here the time element is immaterial." He went on to say that anyone conducting postal P.M. services on specimens that were not preserved, or properly packed and delivered within approximately 24 hours of death, was ". . . probably pulling the wool over aquarists' eyes. . . ."

I asked for more details and Jerzy continued: "The postal side of P.M., if conducted as advised by laboratory personnel, can be of great use in rapid identification of pathogenic organisms, changes in organ cell structure or otherwise. The accepted way to send fish is to wrap the fish moist in a plastic bag, pack in ice in a Thermos flask within 12 hours of death, and send express to the nearest P.M. lab. The fish must arrive within approximately 24 hours of death."

I wanted more information about the practical side of work at their laboratory and asked: "What actually happens when an aquarist wants you to examine a diseased fish, or to analyse a sample of pond or aquarium water?"

Andrew and Jerzy kindly permitted me to use the following excerpt from their article *Fish Pathology Laboratory Procedures at Aquality*, published in the October 1981 issue of their *Aquality Newsletter*. I found my visit and the opinions expressed and information supplied fascinating; and I wish to thank Jerzy and Andrew for their most helpful co-operation. Their article, which I have placed inside quotation marks, follows.

"Usually the aquarist who is experiencing problems with his fish will bring a bag containing a sickly-looking fish, a dead fish—sometimes both in one bag—and a sample of water from which the fish came. A routine questionnaire is

Andrew Stagg (left) and Jerzy Gawor at work in their laboratory

then completed which provides our analyst with clues and sufficient background (information) to this particular case (to enable him) to gain an insight into the significance, magnitude, duration of problem, previous action taken (etc.). Details of size of aquarium/pond, feeding routines, etc. will provide our analyst with more information with which to form an overall picture of the problems being experienced by the aquarist. The questionnaire is so designed as to spotlight immediately any possible errors being made by the aquarist regarding husbandry and care of his fish.

"Armed with all this information and the specimen samples, the analyst then retires to the laboratory to begin his work. In the case of a sick fish or one that has recently died the procedure is to examine the external appearance of the fish—and its behaviour, if relevant. The analyst will be looking for 'marker' symptoms with which he is familiar from his training and experience in dealing with fish diseases. Such signs may include haemorrhaged fins and skin, wounds, sores, excess mucus production, colour changes, listlessness and fins clamped close to the body. All these are noted and checked off on our questionnaire/diagnosis sheet. Following this, skin smears will be taken from significant areas of the fish's body. These can be taken from live fish with no ill effects and with no harm coming to the animal. The smear is taken simply by removing mucus plus one or two scales, mounting these on a microscope slide and coverslip and observing the specimen under the objective of a binocular research microscope.

"Starting with 100 × magnification one scans the specimen for the presence of external parasites, e.g. large protozoa or skin flukes. 400 × will show the presence of the smaller protozoa; and moving up to 1000 × oil-immersion techniques certain motile bacteria can be detected. Experience and knowledge of technique enable the analyst to recognise many of these organisms and determine whether or not their presence is of any significance in the particular case he is dealing with. At this stage, together with information already provided by the aquarist, a sensible diagnosis can be completed.

"Should all work undertaken thus far prove fruitless the analyst will progress to examinations of the various body organs. Sections of gill will be taken from dead specimens and observed microscopically. Anaemic appearance, necrotic (dead) tissue, structural changes such as 'clubbing', and the presence of gill parasites such as flukes (*Dactylogyrus*) are all parameters that will be checked out thoroughly.

"Further analysis requires the taking of bacteriological smears from significant areas, e.g. lesions or ulcers, for subsequent differential staining and culture for positive identification of bacterial species. Such work is deemed necessary only in economically important cases such as fish wholesalers/farmers, ponds stocked with expensive fish, expensive marine fish, or where antibiotic sensitivity testing of an infective strain of bacteria is requested for a subsequent course of treatment prescribed by a veterinary surgeon.

"Internal examination of the visceral organs will centre upon the gut system: removing the contents into sterile saline and examining these for gut parasites such as *Hexamita*, nematodes, cestodes, etc., (and) the liver, kidneys and spleen in an attempt to observe possible bacterial or viral infested tissue. Differential staining of smears will be undertaken in order to identify or at least group closely related bacteria such as *Aeromonads*, *Pseudomonads*, *Vibrio*, *Myxobacteria* and *Mycobacteria*. The swim-bladder will also be checked for inflammation.

"Preservation of specimens prior to examination is important and should be carried out according to our recommendations. The specimen should be kept damp and cool—*not* deep frozen or preserved in formalin as these methods destroy much of the evidence that the analyst is searching for. Specimens should arrive at the Laboratory within 24 hours after death for any degree of accuracy in a subsequent diagnosis.

Water

"We turn now to water analysis where more often than not the root of all aquarists' problems lie. The water is the home of the fish with which the animal is in direct contact for the duration of its life. Allow the fish's environment to deteriorate and the fish will very soon show stress, succumb to infection and probably die. In a routine water analysis the analyst will look for the common parameters that indicate whether a body of water is suitable for a particular species of fish that is being kept by the aquarist.

"One of the most important factors is the level of acidity or alkalinity in the water, i.e. the pH. For most freshwater species this should fall in the region of the pH scale 6·8-7·8. For marine species 8·2-8·4 8s ideal. Any variation from this indicates that the system may be imbalanced or that external factors are affecting the water. Quite often we have found the pH of pond waters to be in excess of 9·5. On subsequent investigation it was found that uncured concrete in the pond was responsible for this alkalinity.

"The total ammonia, nitrite and nitrate contents read as parts per million (ppm) are the next important parameters. These are a measure of the nitrifying potential of an aquatic system; or, in other words, of how quickly the toxic waste excreted by the fish is broken down by beneficial bacteria to less harmful substances. The excreta of fish, excess food, decaying leaves, etc. all contribute to the ammonia content of the water. This one substance is responsible for many of the problems experienced by aquarists.

"The hardness level in fresh water should ideally fall in the region of 100-150 ppm. Geographical areas will vary quite considerably. In aquaria hardness levels above this figure are sometimes attributable to gravel containing limestone chips.

"Specific gravity or salinity is important in the marine system and certain levels must be adhered to. Wide variations will often stress fish and make them susceptible to infection.

The buffer capacity of salt water is also very important in helping to maintain the high pH necessary for marine fish culture. A fall in this will eventually lead to a collapse in pH to dangerous levels—sometimes measured in our Laboratory as a pH of 6·9.

"Levels of copper are also measured. This is frequently found in tap water, especially if the water has for any length of time been stored in hot water cylinders—invariably made of copper. Copper levels in excess of 0·30 ppm can be lethal in maine culture systems.

"Having thus completed our analysis we will give the aquarist a written report of the results together with suggested action and recommendations for therapy if this is deemed necessary. It is then hoped that acting on the advice given the aquarist's 'problems' situation will be tackled effectively and overcome."

Jerzy Gawor (left) and Andrew Stagg prepare a microscope slide in their laboratory

Incidentally, the basic charge, including a written report, for a water analysis is £1·50, and for an examination of a diseased fish is £4·00. (B.W.)

The origin of the word 'Aquarium'

by James Barrie

RECENTLY, IN HIS "Coldwater Jottings" column (*Aquarist*, October, 1980), Frank Orme remarked that P. H. Gosse "was the man who first coined the word 'aquarium' in about 1853". This view, which has been repeated often in popular histories of the hobby from a relatively early date, is wholly incorrect. Gosse did not coin the word, nor was he the first to use it in the 'modern' sense, and 1853 is not the relevant year.

On large Roman estates the slave in charge of the fountains, pools, fishponds (*piscinae*) and trench surrounding the garden to keep out stray animals, was called the *aquarius* (R. Wright, 1934, *The Story of Gardening*). The *aquarium* was where the cattle came to drink.

Much later, *aquarium* became a botanical term for a place where aquatic plants, both temperate and tropical, were cultivated. An instance of this usage occurs in the rather long-winded title to a folio of plans by George Tod, published in 1807: "Plans, Elevations and Sections of Hot-Houses, Green-Houses, an Aquarium, Conservatories, etc., Recently Built in Different Parts of England. . . ." In the Preface to the collection, Tod highlights this as "an example of an Aquarium, the only one ever built on such a construction."

Home Aquarium

A more homely allusion comes from Mrs Loudon, that doyen of Victorian lady gardeners, in her *Lady's Garden Companion*, 1845. She advises her genteel readers: "The best plan is to have a cistern in the house, as it can be used as an aquarium; and there are many beautiful tropical aquatics . . . which deserve growing for their beauty, while others are interesting for their curiosity. . . ."

Evolution of the term to encompass an interdependent aquatic community of plants *and* animals can be traced in publications from 1852 onward.

Gosse's initial contribution to the aquarium literature is in the form of a notice, dated September 10th, 1852, to the editors of the *Annals and Magazine of Natural History*. His purpose in writing was to put on record the simultaneity of his experiments with those carried out by the chemist, Robert Warington, to establish "that the balance can be maintained between the plant and the animal for a considerable period at least, without disturbance of the water". In this paper Gosse calls the containers in which he held his specimens *vivaria*. He makes one passing reference to the *aquarium*, but is quoting when he does so.

Gosse, by his own account, had learned of Warington's work through a report in *Chambers' Edinburgh Journal* of July 10th, 1852, which was based on a paper by Warington in *The Gardener's Magazine of Botany and Garden Companion* of January, 1852. A short extract from this report is sufficiently explicit to speak for itself.

"An interesting companion to the Wardian Case has lately been presented in the Aquatic Plant Case, or Parlour Aquarium, due to the ingenuity of Mr Warington. . . . It may be described as a combination of the Wardian Case and the goldfish globe, the object being to illustrate the mutual dependence of animal and vegetable life." The botanical connection is further underlined by the writer when he points out: "The Parlour Aquarium affords valuable . . . facilities to the naturalist for the prosecution of his researches. The botanist can now conveniently watch the development of aquatic plants under conditions not unnatural, through the entire period of their existence. . . ."

Fish as well

In September of this same year, the second edition of Nathaniel Bagshaw Ward's famous monograph *On the Growth of Plants in Closely-Glazed Cases* came out. Back in 1841 Ward had put about a dozen goldfish into a twenty-gallon vessel furnished with a variety of plants, where they had remained healthy, without water changes, until he moved house from Wellclose Square to Clapham in 1848. Now, in the new edition of his monograph, he recounted these events (already made known somewhat obscurely in the voluminous *Official Descriptive and Illustrated Catalogue of the Great Exhibition 1851*) under the caption "*Aquarium For Fish and Plants*". On the strength of this, James W. Atz, when he was Assistant Curator at the New York Aquarium over thirty years ago, concluded that Ward was the first person to employ the term *aquarium* in print *sensu lato* ("A Brief History of the Word *Aquarium*", *Aquarium Journal*, January, 1949). But the chronological sequence shown here suggests that the credit should have gone to the anonymous writer in *Chambers' Edinburgh Journal*.

None of this detracts from the crucial role of Gosse in popularising aquarium keeping as a hobby and gaining international recognition for the word in its broader meaning. Right at the outset he had perceived the tremendous recreational and educational possibilities. In his paper of September, 1852, he admitted: "My ulterior motive in this speculation was twofold. First, I thought that the presence of the more delicate seaweeds . . . growing in water of crystalline clearness in a large glass vase, would be a desirable ornament in the parlour or drawing-room. . . . But more prominent still was the anticipation that by this plan great facilities would be afforded for the study of marine animals under circumstances not widely diverse from those of nature."

He closes the piece with a glimpse into the future: "Should these experiments be perfected, what would hinder our keeping collections of marine animals for observation and study, even in London and other inland cities . . . ? I hope to see the lovely marine Algae too, that

hitherto have been almost unknown except pressed between the leaves of books, growing in their native health and beauty . . . on the tables of our drawing-rooms and on the shelves of our conservatories."

Popularised by Gosse

Aquarium in its new guise was not absorbed into the vocabulary unquestioned. Up until publication of Gosse's *The Aquarium*, 1854, and for some time thereafter, it was applied unevenly by authors, including Gosse himself, vying for pride of place with its principal rivals, *vivarium* and *aquavivarium*, both held by some scholars to be etymologically more suitable. Its ultimate adoption was largely due to the success of Gosse's book and his able defence of the term. It is interesting to note that *The Aquarium*, which sold like wild-fire and ran through two editions, was so named as an afterthought when the book had already gone to press. Previously the intention had been to call it *The Mimic Sea* (Edmund Gosse, 1890, *The Naturalist of the Sea Shore*).

Writing in *The Aquarium*, Gosse does give the impression, perhaps unintentionally, that it was he who adapted the term, which may partly explain how the mistaken attribution came into vogue. Significantly, in defending the new use of the word, he makes the botanical antecedent a powerful justification for its choice. His argument is irresistable: "The term had already been in use among botanists . . . and the employment of the same term for our tanks is not forbidden by the character of the service to which they are put, since this is not an alteration, but only an extension. The growth of aquatic plants is still a most important and pleasing feature of our pursuit, and the addition of aquatic animals does not detract from the appropriateness of the appellation."

Bolstering the Myth

Two very eminent 19th century professional aquarists (although strictly this term was not yet in general use—but that's another tale) lent credence to the story that Gosse was originator of the word *aquarium*. One was W. Saville Kent, whose name is associated with the public facilities at Brighton, Manchester, Yarmouth and the grand, if short-lived, Westminster Aquarium. During a lecture given before the Society of Arts in 1876, he said: "The earliest mention of this word aquarium would appear to be in 1853, when it was introduced by Mr. P. H. Gosse. . . ."

The other was the great William Alford Lloyd of Crystal Palace Aquarium fame, whose varied career stretched back to the earliest days of the hobby. His advice was much sought by contemporary European and American public aquarium designers, and he was consulted by Dr. Anton Dohrn when the pioneer Marine Biological Station was being planned at Naples in 1872. In an article entitled "Aquaria: Their Past, Present, and Future" (*Popular Science Review*, July, 1876), he says: " . . . N. B. Ward experimented with aquaria about the year 1840, though he did not use the word 'aquarium', which was employed for the first time in print, as far as I know, twice by Mr. P. H. Gosse in his *Devonshire Coast*, 1853. . . ." The word actually occurs in *three* places; but more importantly, Lloyd fails to mention that Gosse evidently felt no strong commitment to the expression at this stage, because in the body of the main text, and in an appendix, he prefers the heading "MARINE VIVARIA".

It is ironic that these two men who disagreed so violently over the techniques of aquarium management, should have joined forces in perpetuating a myth. A fiction founded on such seemingly impeccable authority understandably dies hard. It is perhaps too much to expect that it will ever be buried completely; the most one can reasonably hope to do is hammer a few telling nails firmly into the coffin.

Price increase

In January 1982, the price of this magazine has increased from 60p to 70p. While we regret that a further increase has become necessary as from January, 1983, we are happy to announce that the increase will amount to no more than 5p. At 75 pence the A & P is still the cheapest magazine for fishkeepers and the best value for money.

NEWS... From Aquarists' Societies

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

SOUTH EAST

THE **Sudbury A.S.** held their a.g.m. on 6th October. The committee is now: Secretary, John C. Mann, 58 Raymers Lane, Harrow, Middx HA2 0UQ (tel: 01-864 6095); Show Secretary, Barry Witteridge, 150a Preston Road, Wembley, Middx. (tel: 01-904 0818); Chairman, Laurie Brazier; Treasurer, Colin Richards. The society meets every Wednesday at St. John's Church Hall, Harrow Road, Wembley at 8 p.m.

* * *

THE **South Park Aquatic (Study) Society** changed the normal format for a special night dedicated to the feeding of Coldwater fish on 19th October. Instead of the more usual single speaker, four club members gave individual talks on their own favourite live foods. Dave Brooks, Fred Pearl, Tony Jacques and Roy Trim extolled the virtues of Micro Eels and Worms, Fruit Flies, Garden and White Worms and Daphnia with examples circulating amongst the audience, and many of the members taking home samples to try on their own stock. Besides the project Globe-eyes which were on display, a table show was held for teams of 1982 bred fish. Dave 'Mac' Mackay was judge and awarded the following cards: 1, E. Franklin (Tench); 2, Mary Franklin (White Cloud Mountain Minnows); 3, E. Franklin (Comets); 4, T. Jacques (Pearlscales). The Society specialises in coldwater fishkeeping and meets at 8 p.m. on the 3rd Tuesday of every month at the Wimbledon Community Centre, St. George's Road, London SW19. New members and visitors always welcome. Full details from: Mrs. Marguerite Dudley, 163 South Park Road, Wimbledon, London SW19 8RX. (Tel: 01-540 5662).

* * *

THE **Newham Aquarist & Reptile Society** held their a.g.m. at Lathom Road School, East Ham, London E6, on 6th October. The officers for the coming year are: Chairman, F. W. Chapman; vice-chairman, M. Morram; secretary, N. Johnson; P.R.O., T. J. Labrum; F.B.A.S. delegate, A. Chapman. Meetings are held at Lathom Road School, East Ham, E6, at 8 p.m. on the 1st and 3rd Wednesday each month. New members and visitors are always welcome. For further information please contact: Mr. N. Johnson, 60 First Avenue, Dagenham, Essex.

* * *

Federation of British Aquatic Societies. 1983 will bring an event which no aquarist should miss, a unique opportunity to meet one of the world's leading aquatic authors at a very special, first-time-ever occurrence. Blandford Press, in collaboration with the Federation of British Aquatic Societies, will be launching the English edition of the "Aquarists Encyclopedia" by Gunther Sterba (publication date 21st March 1983, £18.50) and the occasion will be graced by the presence of Dr. Sterba himself—a most notable 'first' for both publisher and author, as it is believed that this will be Dr. Sterba's first visit to this country. In addition to the formalities of the book launch, the F.B.A.S. have organised a Convention to mark the event, and of course, the Guest Speaker will be Dr. Sterba; in the evening, there will be a commemorative dinner. The date will be 19th March 1983 and the venue will be the Logan Hall at the University of London. It is anticipated that there will be a great demand for tickets—with aquarists even coming from abroad—and therefore tickets will be issued on a first come, first served basis. Further details, including the price and how to book tickets, will be released via the aquatic press as soon as possible.

* * *

CATFISH were the subject of a talk given by Mike Sandford to members of the **East Kent Aquatic Study Group** at their October meeting at the Memorial Hall, Bettinge, Herne Bay. The sixty members were enthralled by the beautiful colour slides which Mike used to illustrate his most enjoyable and educational talk. Guest judge for this month's table show was Keith Beadle who awarded place cards: Pairs (Egglayers): 1, C. J. Bridgeman; 2, M. Boniface; 3, B. Marsh; 4, S. Mason. Pairs (Livebearers): 1, P. Edwards; 2, 3 and 4, A. Aspinal. Pairs (Coldwater): 1, V. Bird; 2 and 3, D. Bridgeman. Membership of this successful society continues to increase at each meeting, which are held on the second Tuesday of each month.

* * *

THE **East London Aquarists & Pondkeepers Association** held their 34th annual open breeders show at The Cathcarell Hall, Cecil Road, Chadwell Heath, Essex. Results: Ag: 1, Roger Campion; 2, D. Seaman (Ilford); 3, P. Mills (Walthamstow); 4, T. Waller (Southend). Ak: 1, M. Shadrack (Ilford); 2, P. Mills. Za: 1, P. Coe (Walthamstow); 2 and 3, C. Chewwright (Southend); 4, B. Light (East Dulwich). Zbc: 1, M. Howells; 2, P. Mills; 3 and 4, C. and D. Chewwright (Southend). Xb: 1 and 4, R. Campion; 2, K. Wrighton; 3, F. Simmons. Xc: 1, 2 and 3, R. Boss; 4, R. Campion. Xdb: 1 and 2, R. Campion. Xdc: 1 and 2, F. Vickers. Xdz: 1 and 3, A. Essaray; 2 and 4, G. Ponsford. Xe: 1, 2 and 3, D. Ridgewell (Southend); 4, K. Wrightson. Xes: 1, K. Wrighton. Xf: 1, C. Chewwright; 2, R. Campion. Xg-m: 1 and 4, R. Campion; 2 and 3, D. Theobald (East Dulwich). Xjk: 1, R. Boss; 2, F. Simmons; 3 and 4, R. Campion. Xo-s: 1, K. Wrightson; 2, A. Waller (Southend); 3, D. Theobald; 4, J. Symonds. Xt: 1, B. Light; 2, P. Coe; 3, P. Mills; 4, A. Waller. Xuv: 1, 3 and 4, D. Mills; 2, R. Campion. Nb: 1 and 2, A. Dempsey (East Dulwich); 3, R. Campion; 4, D. Howells. Ncd: 1, J. Symonds. Nf: 1, B. Light; 2, D. Theobald; 3, C. Chewwright; 4, W. Chapman (Corringham). Ne: 1 and 3, D. Ridgewell; 2, W. Hastings (SE London); 4, P. Somers (SE London). Nn: 1, B. Light; 2 and 4, D. Chewwright; 3, M. Wrightons (East Dulwich). Nuv: 1, 2, 3 and 4, D. Mills. Total number of entries 192.

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THE 1982 **Bethnal Green & Independent A.S.** open show was a great success with 427 entries and was run to the Association of Aquarists rules. The society wishes to thank the judges Mr. A. Blake, Mr. R. Bowes, Mr. I. Fuller, Mr. M. Goss, Mr. D. Lambourne, Mr. R. Paine, Mrs. J. Ellis, Mr. D. Mackay, Mr. G. King (G.S.G.B.) and also to Mr. T. Glass for presenting the prizes. Results: Class F.A: 1, Andrew Waller (S.L.A.D.S.). 1A: 1, C. Tonna (Bracknell); 2 and 4, D. Cruickshank; 3, A. Payne (Basingstoke). 1B: 1 and 3, D. Cruickshank; 2, J. Parrt (Rom.); 4, C. Tonna. 2A: 1, H. Smith (Sud.); 2, A. Waller; 3, P. Riley (BG&IAS); 4, J. Parrt. 2B: 1, M. Kirkham (CMCG); 2, M. Smith (Rom.); 3, P. Riley. 2C: 1 and 4, J. Parrt; 2, P. Riley; 3, Mr. and Mrs. Carney (BG&IAS). 3A: 1, W. A. Knight (Havant); 2, A. Cox; 3, P. Riley; 4, A. Thompson. 3B: 1 and 2, A. Fuller (KDAS); 3, M. Marsh (Rom.); 4, A. Thompson. 3C: 1, W. A. Knight; 2, J. Parrt; 3, W. Phasey (Wolverhampton); 4, P. Riley. 4A: 1, 2 and 4, M. Kirkham; 3, A. Neish (Bedford). 4B: 1, Lisa Rendell (BG&IAS); 2, A. Waller; 3, A. Neish; 4, Mr. and Mrs. Carney. 4C: 1, M. Kirkham; 2, S. Norris (Bracknell); 3, A. Payne; 4, Mr. and Mrs. Carney. 5: 1, M. Smith; 2, S. Norris; 3, R. Davies (Bedford); 4, A. Hindx (Bedford). 6A: 1, D. Cruickshank; 2, J. Farrell (BG&IAS); 3, M. Kirkham; 4, G. Hicks (Bexley). 6B: 1, D. Woods; 2, A. Cox. 7A: 1 and 2, W. A. Knight; 3, C. Crook (Wolverhampton); 4, J. Parrt. 7B: 1, A. Waller; 2, C. Crooks; 3, H. Smith; 4, A. Hinds. 8: 1, T. Cruickshank; 2, C. Tonna; 3, J. Pern; 4, L. Tuck (BG&IAS). 9: 1, A. Neish; 2, L. Tuck; 3, M. Franklin (SPASS); 4, A. Waller. 10: 1, S. Norris (Bracknell); 2, M. Wright (BG&IAS); 3, A. Hinds; 4, A. Waller. 11: 1, A. Fuller (Kingston); 2, T. Cruickshank; 3, A. Hinds; 4, P. Riley. 12A: 1, A. Hinds; 2, C. Tonna; 3, A. Fuller; 4, M. Kirkham. 12B: 1, M. A. Clarke (SLAG); 2, M. Strange (Basingstoke); 3, A. Waller; 4, J. Parrt. 13: 1 and 2, J. Parrt; 3, M. Kirkham; 4, D. and P. Lambert. 14: 1, A. Brown; 2, M. Smith; 3, D. and P. Lambert; 4, M. Kirkham. 15: 1, D. and P. Lambert; 2, M. Marsh; 3, A. Waller; 4, D. Cruickshank. 16: 1, M. A. Clarke; 2, A. Waller; 3, D. and P. Lambert; 4, M. Marsh. 17: 1, H. Smith (Sudbury); 2, A. Waller; 3 and 4, M. Marsh. 18: 1, M. A. Clarke; 2, Mr. and Mrs. Carney; 3, M. Strange; 4, P. Riley. 19: 1, G. M. Parker (W'Borough); 2 and 3, M. Dudley (SPASS); 4, W. Woodward (Bexley). 20: 1, G. M. Parker; 2, M. Dudley; 3, M. Franklin (SPASS); 4, W. Woodward. 21: 1, W. Woodward; 2 and 3, E. Franklin (SPASS); 4, M. Wright. 22A: 1, A. Brown (BDAS); 2, M. Kirkham; 3, A. Fuller; 4, C. Tonna. 22B: 1 and 3, D. and P. Lambert; 2, M. A. Clarke; 4, C. Tonna. 22C: 1, W. Woodward; 2, E. Franklin; 3, J. Polland (SPASS); 4, M. Wright. 23: 1, W. Woodward; 2, A. Waller; 3, M. Kirkham; 4, W. Woodward. 24: 1, 2 and 3, Dawn Tuck (BG&IAS); 4, Lee Rendell (BG&IAS). Best Fish in Show: W. Woodward with an Angelfish angelfish. Highest Pointed Society: Romford and Becontree A.S. Best Baboit by a Lady: Mrs. D. Cruickshank.

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Reigate & Redhill A.S. a.g.m. for 1983 will be held on 3rd January, 8 p.m. in the meeting room of the Woodhatch Public Library, Woodhatch, Reigate, Surrey. An a.g.m. need never be a bore for this is the opportunity for members to elect a new committee, besides expressing their views, ideas and interests for the year ahead. Past and prospective new members will be most welcome to attend. Thereafter the club will meet regularly on alternate Monday evenings. For further information please phone Horley 6078.

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NEW SOCIETY

South East A.S. (SEAS) which is a new Society, meets at Hampton Football Club at 7.30 p.m. on the 1st and 3rd Mondays. Beginners and experts welcome; juniors too. Friendly atmosphere. For any enquiries ring Ken Condon on 945 1940. Many thanks to all those people who made the 'Bring and Buy' sale a success as well as an enjoyable evening on 18th October.

SOUTH WEST

Severnside A.S. held their a.g.m. on 23rd October at "The Black Horse," West Street, Old Market, Bristol. Officers elected: Chairman, Peter Gadd; Secretary, Larry Lerway; Treasurer: Sheila Lerway. Judges and Stewards Committee officers: Chairman, Wally Holland; Secretary, Mary Gadd. A local well known aquarist, Mr. Tommy Thomas, was elected life president. He is a member of North Avon A.S. and Bristol Aquarist. Any society requiring further information regarding the Association please contact the Secretary, Mr. L. Lerway, 30 Fairford Crescent, Stoke Lodge, Patchway, Bristol. The next Severnside A.A. will be held at "The Black Horse." 22nd January, at 2.30 p.m.

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LEADING a discussion on "Preparing Goldfish for Winter," Stan Lloyd, President of **Bristol A.S.**, advised members to give their ponds a good overhaul as soon as the leaves had stopped falling. He emphasised that the aim was to give the fish the best conditions by removing anything that was likely to die or decay. There was some difference of opinion about removing water lilies for the winter, but agreement that they should be trimmed back. Table show results: Baby Shubunkins: 1, 3 and 4, I. Middon; 2, J. Day. Biggest baby fish bred 1982: J. Day. The Society meets on the second Tuesday of the month at St. Ambrose Church Hall, Stretford Road, Whitchall, at 7.30 p.m. Hon. sec., V. Cole, 10 Hardwick Close, Bristol BS4 4NL (0272-711286) for details or help with Goldfish problems.

EAST

Southern Livebearers Aquatic Group in Association with Aquarian, held their first International Open Livebearer Show on 31st October, at Howden, North Humberside. Results: Gambusia (Male): 1 and 2, F. S. Draycott; 3, G. Kane. Gambusia (Female): 1, J. and K. Corbett; 2, R. MacIntosh; 3, F. A. Moye. Gambusia (Pairs): 1, R. MacIntosh; 2, P. A. Moye; 3, F. S. Draycott. Poecilia and Micropoecilia (Male): 1, R. Cutts; 2, J. and K. Corbett; 3, K. Clayton. Poecilia and Micropoecilia (Female): 1, J. McFall; 2, F. S. Draycott; 3, J. Lynch. Poecilia and Micropoecilia (Pairs): 1, J. Lynch. Xiphophorus (Male): 1, F. S. Draycott; 2, S. Wilson; 3, D. Barrett. Xiphophorus (Female): 1 and 2, F. S. Draycott; 3, D. Thompson. Xiphophorus (Pairs): 1, F. S. Draycott. Goodeidae (Male): 1, A. Palmer (Best Fish in Show); 2, J. McFall; 3, T. Stansfield. Goodeidae (Female): 1, D. Barrett; 2, Mr. and Mrs. Marshall; 3, T. Smith. Goodeidae (Pairs): 1, P. A. Moye; 2, P. Noble; 3, D. Barrett. Brachyrhaphis and Heterandria (Male): 1, J. and K. Corbett; 2, M. Strange; 3, G. Kane. Brachyrhaphis and Heterandria (Female): 1, M. Strange; 2, D. Thompson; 3, F. S. Draycott. Brachyrhaphis and Heterandria (Pairs): 1, J. and K. Corbett; 2, P. Noble; 3, F. S. Draycott. Phallichthys Girardinus and Carlhubbsia (Male): 1, Mrs. Anderson. Phallichthys Girardinus and Carlhubbsia (Female): 1, Mrs. Anderson; 2, M. Strange. Phallichthys Girardinus and Carlhubbsia (Pairs): 1, Mrs. Anderson; 2, J. Lynch; 3, M. Clarke. Cnesterodon Neoheterandria Phallocerus (Male): 1, F. S. Draycott. Phallopsychus and Poeciliopsis (Pairs): 1, M. Clarke. A.O.V. (Male): 1, D. Barrett. A.O.V. (Female): 1, M. and P. Jordan; 2, A. Palmer; 3, D. Thompson. Cultivated Guppy (Male): 1, J. Riley; 2, T. Stansfield; 3, F. S. Draycott. Cultivated Guppy (Female): 1, J. Breckenbury; 2, F. S. Draycott. Cultivated Guppy (Pairs): 1, T. Stansfield; 2, J. Riley. Cultivated Molly (Male): 1, A. Palmer; 2, Mr. and Mrs. Marshall; 3, J. Lynch. Cultivated Molly (Female): 1, Mr. and Mrs. Marshall; Cultivated Molly (Pairs): 1, F. S. Draycott. Cultivated Swordtail (Male): 1, M. and P. Jordan; 2, Mr. and Mrs. Marshall; 3, J. Riley. Cultivated Swordtail (Female): 1, Mr. and Mrs. Marshall; 2, M. and P. Jordan. Cultivated Platy (Male): 1, Mr. and Mrs. Marshall; 2, A. Palmer. Cultivated Platy (Female): 1 and 2, F. S. Draycott; 3, P. Lane. Cultivated Platy (Pairs): 1, M. Clarke. Breeders 'A': 1, G. Kane; 2, Mrs. Anderson; 3, F. S. Draycott. Breeders 'B': 1 and 2, K. Clayton; 3, T. Smith. Breeders 'C': 1, D. and P. Lambert; 2, F. S. Draycott; 3, P. Lane. Breeders 'D': 1, P. Noble; 2, F. S. Draycott; 3, J. and K. Corbett. Best Breeder: P. Noble.

NORTH

The International Convention of the **British Killifish Association** drew enthusiasts from all over the UK, Europe and America, to Leeds University in September to meet and discuss their unusual hobby, deal with Association business and display their prize specimens in the nine show classes. Mr. E. Hemingway, chairman of the BKA's Collingham Group, which organised this year's event, commented, "This is the first time our International Convention has been held in the North of England, and Leeds was chosen because its central position and good communications network makes it easily reached from all over the UK." Native to South America and South, East, and West Africa, killifish live and die according to the brief rainy seasons—sometimes only a matter of 15 weeks. Their eggs are laid in soft mud which, as it dries out in the sun, encases them and they lay dormant until the next rains. Two types are laid by each female, one of which hatches should the rains arrive on time and the other, called "sleepers," can remain fertile for two years of drought. The fish are small and attractively coloured with many different species, each adapted to its particular local climate. Breeding killifish is a complex and interesting hobby, attracting enthusiastic followers from all age groups and walks of life. Patience and care are required to hatch eggs successfully—for example, incubation in the moist peat, used by breeders as a substitute for soft mud, may require different temperatures, times and moisture for each species.

Guest speakers at the convention included Dr. De Bruyn of the Belgian Killifish Society, who talked about killifish in West Africa; Dr. Chubb of the Department of Zoology, Liverpool University, whose lecture covered fish diseases; and Mr. E. Hemingway, who related his observations on collecting killifish in East Africa. Over 200 fish were on view, with the award for the best fish in the show being won by Mr. M. Colling (British Killifish Association) and the Best Foreign Exhibit from K. H. Luke (West Germany).

Results: Aphyosemion (Small, less than 2 in.): 1, A. Brown; 2, R. Roberts; 3, A. Wetheridge. Aphyosemion (Large, more than 2 in.): 1 and 2, K. H. Luke (West Germany); 3, T. Rowley. A.V. other than listed classes: 1, R. Scotlock; 2, M. Collins; 3, D. Williams. Roloffia: 1, R. Brown; 2, G. Edgecombe; 3, S. Moorhouse. Rivulus: 1, B. Tate; 2, G. Edgecombe. Epiplatys: 1, M. Collins; 2, De. Bruyn (Belgium); 3, L. Emsden. Sth. American: 1, I. Sainthouse; 2, M. Price; 3, R. Roberts. Nothobranchius (E. African): 1, A. Wetheridge; 2, I. Sainthouse; 3, R. C. Perry (Canada). North American and European: 1 and 2, J. Van Rompu (Canada); 3, D. Donor.

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NEW SECRETARY

THE new secretary for the **Darlington and District A.S.** is Mr. C. Archer, 64 Whitefields Drive, Richmond, N. Yorks. DL10 7DL, who would be pleased to hear from the secretary of any other society who could give assistance in offering tapes, slides, films, quizzes, etc. for use at future meetings. The society meets at "The Golden Cock," Tubwell Road, Darlington, every other Tuesday at 7.30 p.m., where new members will be most welcome.

Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

3rd April: MALVERN & DISTRICT A.S. 10th open show at Christ Church Hall, St. Bernards Green, Malvern. 1st place trophies as well as perpetual trophies. Enquiries to: Show Secretary, S. K. Yallop, 3 Monkhide, Yarkhill, Ledbury, Herefordshire. HR8 2TX. (Tel: Trumpet 562).

22nd May: ABERDARE A.S. first open fish show at Aberaman Y.M.C.A., Aberaman, Aberdare. Further details to follow.

5th June 1983: SUDBURY A.S. 11th open show at Neasen High School, Quainton Street, Neasden, NW10. Further details from Barry Witteridge (tel: 01-904 0818).