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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



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Coldwater Booklet

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THE AQUARIST AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

Published Monthly

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The Editor accepts no
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Copper-banded Butterflyfish
Chelmon rostratus
Photo by:
A. van den Nieuwenhuizen



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WHAT IS YOUR OPINION?



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

I SHOULD LIKE to wish all my readers a happy and peaceful 1983. I hope that, as in 1982, you will send me a letter for this feature. I'm pleased to begin this month's column with a letter from Miss Margaret Cairns, B.A., 17 Watts House, 105 Wormington Road, London, who writes: "It has been a great relief to read of the confusion between *Apistogramma borelli* and *A. cacatuoides* (W.Y.O. Sept. 1982). I started keeping *Apistogramma* about 18 months ago, but could neither write of my experiences nor ask for advice because of my inability to identify the fish concerned.

"I had been given a new 24 in. x 12 in. x 12 in. aquarium and had decided to look around for fish which I had not kept before and which might prove to be a challenge; the *Apistogramma* fry on sale at a local dealers were the first that I had seen (these fish are extremely rare in my area) and I decided to set up the new tank with these cichlids.

"The tank had already been set up with the 'basic'—about 7 to 10cm. of gravel, small rocks to hold the gravel in tiers which increased in depth towards the rear of the tank and one larger, flat, triangular slab of rock which,

when placed upright on its longest edge, and held FIRMLY in place by the gravel at the base, hid the heater/thermostat. The unit touched neither the rock nor the glass and an air out-let placed about 8cm. from the tube ensured adequate heat circulation. Plants had been placed in the deep gravel behind the rocks and I had added five glowlight tetras about ten days after planting.

"The setup was modified for the new cichlids by the provision of about 20 hiding places; six of these were potential 'nests' for the rearing and protection of fry, with a narrow entrance and a roomy interior which the fish could clean easily (buried meat-paste jars with the rim hidden, and partially covered by rocks.) These were spaced out around the tank and surrounded by small cleared areas which offered no hiding places for predators. The additional refuges were formed by making small piles of rocks and grading the spaces between these to fit the sizes of the smallest fish; this arrangement has the disadvantage that a sick or injured fish may hide so successfully that the aquarist is unaware of trouble, but cuts losses from injury or predation on fry enormously. I should stress that I knew nothing about *Apistogramma* but had guessed from their elongated shapes and horizontal stripes that the new fish would be cave-dwellers. Had they also proved to be gravel-movers the rock-pile refuges would have needed further modification to prevent fish from being trapped. I once lost a female orange chromide and fry when a rock was dislodged and fell, blocking the nest exit—but fortunately the *Apistogramma* were not construction workers.

"The glowlight tetras remained in the tank, since the cichlids made no move to harm them, and were of much the same size. I was to be glad of this, since the new fish proved an exception to the general

rule that the more hiding places a fish has available the less he will be inclined to make use of them. The tetras were usually the only fish visible. Small, rapid movements amongst the rocks sometimes indicated that something was lurking in the shadows, but that was all. The cichlids had seemed extremely young; I gave them a high protein diet, put the power filter on the tank for much of the time and hoped that they might be more sociable on reaching adulthood. I had been unable to find much information on these fish, was disappointed to find that, although they made rapid growth at first, this seemed to stop at about 6-7cm., and made a mental note to move them to larger quarters should these become available.

"Larger quarters became available more quickly than I had either hoped or wished when a neighbour gave a 3-day Reggae party with disco speakers placed against the radiators. Since the heating system is inter-connected this effectively turned the whole of Watts House into an extension of her stereo system! Sympathetic vibrations in the kitchen fittings jarred the base of my largest tank beyond the tolerance of the mastic and my larger cichlids became refugees. They had settled in and begun the usual post-move orgy of spawning by the time I had repaired and tested the big tank, which was then empty and available for the *Apistogramma*. At almost the same moment a friend (whom I had met through W.Y.O.) sent me a B.C.A. booklet which contained an article on starting with *Apistogramma*, and I discovered that I had been keeping the fish at the wrong temperature.

"On removing the small but adult cichlids from the 24 in. tank I discovered that I had got away with keeping them at 76°F rather than at 80°F+—probably partly because very few of the fish were really *Apistogramma*. I had bought ten fish, which would have

given a maximum of 5 pairs had the dealer been 100% accurate in sexing fry. He seems to have been psychic! The fish were smaller than I had expected and my error in treating adults as growing juveniles possibly complicated identification, i.e. there were a pair of *N. anomala* plus 6 juveniles. McInerney gives the male length as 5½cm. but my largest male reached 8½cm. (None of the young reached this size, even in the large tank.) There were also a spawning pair of non-*Apistogramma* (and young) which I could not identify from books. They were eventually (temporarily) identified from an *Aquarist* article which included a photograph of the distinctive black and yellow check spawning pattern. The article proved so informative that I kept the magazine with the tank notes for reference; we then had a burglary and both magazine and notes vanished in the ensuing chaos.

"The remaining fish were *Apistogramma*; difficulties in identification were worsened by the loss of four adults during transfer (2 jumped; 2 remained in a shell despite rinsing methods which normally remove even *Botia* safely). Although the *Apistogramma* had obviously been spawning I could not be sure that the remaining 4 fish included a pair. Two of these have lyre-shaped caudal fins, elongated rays in the anterior dorsal and extended dorsal and ventral fins; the ventral rays are lemon/violet, the dorsal rays lemon/turquoise. A black line runs down the lateral line, from mouth to caudal base, broadening to a spot a little forward of the centre of the body (when the line fades the spot remains.) The fish are silvery lemon-grey below this line, but a faint darker triangle begins below the spot and extends to the caudal base. A silvery-lemon line above the lateral shades sharply into olive-brown on the upper back. Vivid turquoise lines (of neon tetra-like brilliance) ring the eye

and fan back over the operculum. Both fish have the V-shaped black line running vertically through the eye. They resemble Mr. Sellick's picture in *Cichlidae* (Vol. 5, No. 3, P.68—my only copy of a B.C.A. booklet, unfortunately) more closely than the *W.Y.O.* (Sept.) picture and seem to be *A. cacatuoides*.

"The remaining two fish puzzled me badly until the pictures became available. Both seemed to be females. The first is small, showing a washed-out version of male colouring with small turquoise specks below the eyes; the caudal is not lyre-shaped (*W.Y.O.* Sept.). I might have assumed her to be an immature male had the male displays not implied that she was female, but not compulsively attractive. The second fish was lemon yellow and black and matched Mr. Sellick's picture of a spawning female—*Cichlidae*, as above. However, she seemed to wear the coloration permanently—eventually dying in full colour. Her territory was instantly taken over by a smaller fish showing the same coloration; she withdrew after a month and a third fish, with the same coloration, took the territory at once. I have seen no fish showing this coloration during the past month. The first female has been visible throughout and seemed to take no part in these activities; the males also seemed to ignore the whole thing, although the lemon-black territory encroached on their own. To my knowledge there were two females in the tank; the second two must have matured, possibly from the second female's fry, within about 12 weeks.

"To complicate matters further, the two males do not seem to regard each other as rivals. Both can usually be found in the front, right-hand tank corner, feeding peacefully about 12cm. apart. The first female is usually in the same area. As far as I can tell, these are the original adults placed in the tank and I have not seen fry. However, I must admit that I

cannot tell the adult *Apistogramma* of the same sex apart, except by size differences. I usually work close to the kitchen aquarium; long-lived, large cichlids kept in this tank became very tame, very quickly, spawning uninhibitedly while I took notes from a foot away, bringing their fry for inspection, etc. I got to know these well as individuals and this made observation much easier. The *Apistogramma*, etc. are tame enough to tolerate close inspection but definitely prefer privacy for their personal relationships. I am sure there are more fish in the tank than those I have seen. It is even possible that the population has grown to an extent that prevents the fish on view from finding territories. A metre long tank, replete with hiding places, should have allowed them plenty of scope. It will probably be impossible to observe their behaviour in detail until I can split them up into smaller tanks and observe them as individual pairs. The only fish which could be observed in detail in the larger tank were *A. ramirezi*—but space forbids my going into that."

It was pleasant to hear from Miss Cairns again after a protracted silence. Regular readers will know that she used to write to this feature quite often.

Mr. M. Bedford, a 41 years-old aquarist who resides at 15 Wellington Square, Hastings, E. Sussex, was an aquarist from 1950-1955; and has continued to be an aquarist from 1980 until the present day. He says: "I write in response to your request for information on the spawning of catfish. Like Mr. Brooks, I have been successful with *Corydoras paleatus*, but have also had limited success with *C. hastatus*—or are they *C. pygmaea*? The reference books differ. They are about 1-1½ in. long, silvery underside, well-defined dark brown to black lateral line, brown/grey above and swim a lot in mid water.

"I purchased four of these pretty, little cats about a year ago and one

rapidly outgrew the other three and was obviously a female full of eggs. One reference book lists these as 'not yet bred in captivity'—but there's no harm in trying. They were put in an 18 in. x 12 in. x 12 in. tank with plants, gravel, under-gravel filter, and kept at 76°F. They obliged by spawning on glass and plants two days later; and after a further five days 30-40 babies hatched out. The number gradually diminished until, after 10 days, none was left alive.

"They were spawned again in the same tank, this time with about 1/2 in. of fine sand over the gravel since I suspected the babies had become trapped in the gravel. This time I managed to raise three to maturity, but have recently lost one through mouth fungus. Yet again they were spawned. Incidentally, eggs are laid singly, unlike other *Corydoras*, and mating takes place in mid-water, not on the bottom. The familiar pattern is being followed again with 30-40 hatched; and each day one or two are found dead; and now, after four weeks, some 10 or 12 remain and are just about to achieve the adult colouring.

"A foam cartridge filter has been added to the tank and 20% water changes are made every day. On brine shrimps and egg-layer baby food the growth rate is very slow. At three weeks old *C. paleatus* are larger than three-month old *C. hastatus/pygmaeus*.

"These little fish seem difficult to find in the shops and are so worthwhile in the aquarium that even a low rate of success seems justified. They spawn very easily but rearing does seem to be a problem. I had limited tank space—like everyone else, I suppose—and the original four were placed in a small 16 in. x 9 in. x 9 in. tank used for rearing guppies. They promptly spawned again and have been left with the fry—which are now 8-10 days old. There seems to be no inclination on the parents' part to eat them so I'm

leaving things as they are to see if the survival rate is any better when they are left to their own devices than in the other tank where every care is lavished—and yet results are far from perfect.

"I hope this may be helpful to other aquarists and would be pleased to have any views on improving my success rate. P.S. I have kept very detailed notes on spawning/rearing *C. hastatus/pygmaeus*: pH, hardness, etc.; egg development and fry development; together with sketches of the fry at various ages. If of interest I could write an article around the information for publication in *The Aquarist*." (I suggest you write direct to the Editor, Mr. Bedford. He makes such decisions. B.W.)

Photograph 1 shows a red-eyed tetra, *Moenkhausia sanctae-filomenae*. Please send me details if you have kept and bred this attractive fish. Photograph 2 shows a thriving plant



Red-eyed Tetra—*Moenkhausia sanctae-filomenae*

of Indian fern, *Ceratopteris thalictroides*, which I consider to be one of our most useful and attractive aquarium plants. Please send me details of the conditions under which you successfully grow Indian fern—or water sprite, as it is sometimes called.

No. 57 Gincroft Lane, Edenfield, Ramsbottom, Lancashire, is the address of Master Giles Barlow, who writes:

"I am a 14-years-old schoolboy and am a member of Accrington and District Aquarist Society. I wish to tell you about how I brought up my Oscar from a 1 in. baby to a 9 in. beauty. First of all I took all the community fish from the 48 in. x 15 in. x 12 in. tank. I left the plants in as the Oscar I was planning to buy was only a baby. Next day we went to an excellent shop in Bolton where we bought not one but two normal Oscars.

"When they were let out of their bags they shot to the back of the tank and hid behind a large Amazon sword. I had left four bronze *Corydoras* in the tank to keep the gravel cleanish. For two days the Oscars did not eat a thing; and after trying to tempt them with chicken, liver, beef heart and flake food, I tried freeze-dried river shrimps—which they took one after the other. For the next

week or so I tried them on other foods; but they took only shrimps. One day, however, I bought a cow's heart. I chopped it up and wrapped about three days' meat into separate parcels which I then froze. I tried the Oscars on a small chunk each. They ate these—and more besides. Through the winter I fed them mainly heart

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Ceratopteris thalictroides—Indian fern or water sprite

and gave them the odd shrimps in between.

"When spring came around the Oscars were about 1½ in. long. Now I started experimenting with live foods such as live guppies, which I showed, giving the Oscars only the bad ones. I also tried worms, maggots, wood lice, moths, spiders, and a whole range of other things. The Oscars developed tricks like jumping for food, which they took out of my hand. By now they had uprooted all the plants so I bought two large pieces of bogwood, which made the water brown; but it looked attractive.

"The larger they got the more aggressive they were to the catfish, so the latter were removed. At 5 in. long the Oscars started to fight, so the worse show fish was sold and a 6 in. *Plecotomus* was bought. The two fish fought and on a few occasions they lifted the tank lid. Now the Oscar is 9 in. long and feeding on worms etc., and the catfish is also 9 in. long and feeds on Aquatabs. Recently I bought a 420 litre/hour power filter which keeps the tank much cleaner. Even so I have to siphon off left-over food and do a quarter water change every two weeks. When this Oscar was

small it ate five or six river shrimps at each feeding. Now it will eat a full tub of shrimps in a day—which is three feedings." (It must be an expensive fish to feed! B.W.)

I think there must be a definite connection between the temperature of the air surrounding a light bulb and the possibility of the bulb blowing immediately on being switched on. I lost very few bulbs during the warm summer; but now that autumn is in the air the tungsten-filament light bulbs have begun to blow. Numbers above tanks have blown—as well as a bed-light bulb and a £1.15 bulb in my photographic enlarger, to mention but a few. The latest aquarium bulb to go was a Mazda Brightlight bulb which lasted for a pleasing 192 days. Today I bought an Osram 100 watt Filta Lite bulb at a cost of 43p. While in another store I noticed double-life bulbs on sale at about 49p—I cannot recall the exact price or the particular brand. I did not buy any. I wonder if one double-life bulb would be better value than two cheaper bulbs—such as the Woolworth brand that I usually buy.

15-years-old Robert Robinson has been spending some of his time and money trying to photograph his fish. My own camera and flash are not particularly expensive items of their type but the facilities provided, to-

gether with the Tessar lens, make the outfit suitable for my own particular photographic technique. When I saw some of the flash-spoiled photographs Robert had taken I decided to let him borrow my camera, flash and bracket; and he let me borrow his rather expensive Olympus camera and his Boots flash and hot-shoe fitting. Robert took a couple of rolls of colour-print film; but the prints were spoiled by reflections of the flash unit in the glass—although the focus and exposure were fine. He then took a roll of monochrome film and I developed and printed it. I managed to produce a few reasonable prints—but streaks on the outside of the aquarium glass, combined with reflections of the flash unit, again ruined shots that were properly focused and exposed. To test the equipment I used one 36 exposure FP4 film—half in my camera and half in Robert's. I tried both flash units with each camera. All my photographs were taken at one of my tanks. I carefully cleaned the inside and outside of the glass before I took any photographs. In all cases the flash was mounted on the cameras. All the negatives produced a useable picture—except the middle frame which had to be left blank to ensure that no shots were spoiled when the film was changed from one camera to the other.

The worst shots were those taken using Robert's flash unit—on both cameras. The other photographs were all equally good when my simple flash unit was used. The close-up pictures of the two fish in this month's feature were taken using extension tubes on my camera; the other two shots were taken using Robert's Olympus—which does not have a screw-in thread and, hence, won't accept my camera's extension tubes. As usual, I printed the pictures myself—which reminds me that the bathroom light bulb blew when I switched it on after using the bathroom as my darkroom. I've told Robert how to take fish photographs, and I've demonstrated my technique—although not on a fish tank. When time permits I've promised to call at his home to show him how I take pictures of fish.

There are increasing numbers of fish tanks in the Robinson household—and one in the greenhouse—as well as two garden ponds. Robert is now rearing young goldfish bred from adults in his larger pond last summer.

Mr. Tim Share works on a fish farm in Shropshire. I've agreed to his request to me not to print his address. He writes: "... Quite a long time ago when I first began fishkeeping I used to take great pleasure in reading more experienced aquarists' opinions in your pages of the magazine. Most fellow aquarists, with whom I am at present in contact, agree with me that what the layman writes is 100% better than an expert's account of a particular aspect of the hobby. You may disagree with this—but many Midland aquarists share my opinion.

"My fish house has no windows and therefore is a problem to illuminate. It is a concrete structure of 8 ft. x 20 ft. that was originally a large workshop. Most of the tanks are well-planted so light is an important factor. At first I used small strip-lights; however, I found the bulbs to be very fragile and they had a short life. This method of lighting meant that every tank had to be lit separately. Apart from this adding greatly to the fearful electricity bill, I was forever replacing the bulbs—which was good for the local dealer, but not for me. Gradually I replaced the fittings with ordinary light bulb sockets. Eventually all my tanks were lit by 25 watt and 40 watt clear bulbs—something in which you are very interested. In my experience I found that Crompton's bulbs last longer than all the other makes on the market, as a general rule.

"Two months after this move the electricity bill was nearly twice what the previous one had been—and it was the bill for the summer quarter. After very lengthy experiments and calculations I had to conclude that it was the mass of bulbs which were consuming a

good percentage of the units used. Lighting up the whole fish house, with one or two tanks having separate lighting, was the only option left to me. I wanted a continuation of good plant growth, and I also wanted to light the building up so brightly that the tanks got their daily light requirements for photosynthesis from the over-head bulbs. This presented a problem; but it was solved by my insertion of two eight-foot fluorescent tubes. By no means was it as good as the earlier, separate lighting methods—but I had to be practical.

"Certain tanks containing particular plants that required a great deal of light still had to be lit separately. To light these seven tanks I took a gamble. Gro-lux lighting is good looking (*sic*), safe, and in my opinion economical, so I installed Gro-lux units in them. These were expensive and were a big outlay at the time; but later they proved to be economical. For some reason my favourite plants, Amazon swords and *Bacopa*, did not thrive too well after the new lighting installations. The Amazon swords, which had previously been thrusting shoots all over the place, slowed down.

White cloud mountain minnow—*Tanichthys albonubes*



When I finally decided that the lighting was the factor which was interfering with photosynthesis I changed back to the old method of using ordinary light bulbs—but on the seven tanks only, this time.

"From this I drew a number of conclusions. Gro-lux lighting makes a tank look very attractive but certain plants do not like it. When I first began lighting my fish house I should have experimented with different methods on just a few tanks per method. Strip lights never seem to last long; however, one of the proprietors of the local, Springvale Aquatics, did give me one tip: always be sure the filament is hanging downwards and not at an angle—or sticking up."

When I'm using ordinary tungsten bulbs horizontally in aquarium hoods, or in items such as bed lights, I always hold the bulbs round end on to a light source and look at the filament through the tiny, narrow, clear strip at the bayonet end. I can then mount the bulb in the holder such that the filament receives maximum support from the wire frame inside the bulb. This does help to increase the life of the bulb—although such bulbs are obviously made to hang vertically, with the rounded end down.

I suppose they receive similar support if the rounded end points up—as in the case of, say, table lamps.

I wish to make the point that I do not necessarily agree with the views expressed by contributors to this feature; and I accept no responsibility for the views they express in it.

Well, that brings me to the end of this month's column—typed on a different typewriter for the first time in eighteen years, if I recall correctly—excluding the months when, after I seriously damaged my left hand and wrist, I had to submit my contributions in longhand because I could not type. Fortunately I did not know then that I would be able to type with only two fingers after the accident; but anyway, I couldn't type with too many before the accident. My ancient typewriter, a Smith's Premier Chum Portable that my grandfather bought many years ago at an auction and used for a good few years before passing it onto my father, who passed it to me after his years of using it, has almost reached the stage of being beyond help. I don't know if anyone could fit a new platen now. In any case, it was repaired only once in all that time—when I had it fitted with a new platen. It's an excellent record for a machine that has probably bashed out more than 1,000,000 words for me—most of them for this magazine. Incidentally, next month marks my



Three pencilfish—*Nannostomus anomalus*

18th year as a contributor. Perhaps it's almost time that my ancient typewriter and I bowed out to leave the field open to some younger or older writers with strong backs and strong stomachs.

For a future feature please write to me about: (a) keeping and breeding the white cloud mountain minnow, *Tanichthys albonubes* (photograph 3); (b) the type of lighting which you find encourages good plant growth; (c) photograph 4 includes three delightful pencilfish, *Nannostomus anomalus*; please send me details if you have

bred this little gem; (d) what filter medium or mediums do you use in your filters?; (e) do you feed your fish on live foods or do you use nothing other than dried/flaked foods?; (f) what brands of air pumps would you recommend?; (g) what cures can you recommend as being successful, on your fish, for the common diseases of tropical fish?; and (h) garden ponds in winter. I hope 1983 will be kind to you. Goodbye until next month.

OSCAR



G. Robinson

Your questions answered...

Tropical

Antibiotics— use with care! . . .

Can you give me some information on antibiotics for treating fish diseases and how do I find my nearest vet?

Antibiotics are extremely useful for treating certain fish diseases, but they must be used properly. Before hobbyists undertake any form of antibiotic treatment of their fish, they should consult a local vet (see "Yellow Pages"). The medicine Act 1968 forbids the distribution of antibiotics by unauthorised persons, and hence remedies for the treatment of fish diseases that are sold over the counter in pet stores in the U.K. do not contain such drugs. The incorrect use of antibiotics (including too low dose rates, for inadequate periods, and/or to treat diseases for which they are not indicated) must be avoided, since this may result in the development of dangerous strains of antibiotic-resistant bacteria.

Should it seem likely that your fish are suffering from a systemic bacterial disease (which may be indicated by reddened lesions or ulcers of the body or at the base of fins, raised boils, protruding scales, reddened vent, etc.), then the affected individuals should be separated into an isolation tank. When dealing with fish there are three alternative methods of antibiotic treatment: by injection, by addition of the drug to the water, or by mixing the drug with the food. We will consider the use of oxytetracycline hydrochloride (e.g. *Terramycin*, Pfizer), although your local vet may be able to suggest one or two alternatives depending on the disease to be treated.

(i) *By injection*: this should only be carried out by trained, qualified personnel under veterinary direction. The administration of antibiotics to fish

by injection is only applicable to relatively large, easily handled species. An antibiotic preparation manufactured specially for injection must be used, since the injection of other forms of antibiotics could be dangerous for the fish. A dose rate of 10-20 milligrams of oxytetracycline hydrochloride per kilogram of fish (when injected into the peritoneal cavity) has been found effective in treating certain bacterial diseases of fish. However, antibiotics may also be injected into the musculature of fish and, although a certain amount of the drug may be squeezed out by muscular contractions, this latter route is probably the safest.

After injection the affected fish should be maintained in the isolation tank for several days, and if there are no signs of improvement, further advice sought. When all signs of the disease have disappeared, the fish may be reintroduced into the set up aquarium or pond.

(ii) *By addition to the water*: since antibiotics may also act against the helpful bacteria in a biological (e.g. undergravel) filter, they should never be added to the water of a set up freshwater or marine aquarium. Affected fish must be treated in isolation tanks; the addition of one level teaspoon of *Terramycin Soluble Powder* (Pfizer) to each 10 litres of water gives a concentration of 20 milligrams of active ingredient per litre. The antibiotic can be dissolved in a little water from the isolation tank, and then mixed thoroughly with the remaining bulk of the water. The water will redden slightly.

The above concentration has been found of some use in treating certain bacterial diseases of fish. The fish should be left in the (treated) isolation

tank for at least five days. If at any stage the fish become noticeably distressed, a partial water change should be carried out. If there are no signs of improvement after five days, a water change should be carried out and the above dosage repeated (watching for signs of distress in the fish), or you may contact your local vet again. Unfortunately this method of treatment has a drawback in that hard water may interfere with the antibiotic in solution or prevent its uptake by fish. Higher dose rates may, therefore, be required under these circumstances.

(iii) *By mixing with food*: this is difficult on a small scale, although in the U.S. Tetra market an antibiotic medicated food for pet fish. This food is not available in the U.K., and the addition of antibiotics to the food of fish is primarily restricted to fish farm situations. Larger fish such as Koi and goldfish may be fed medicated food by making a slurry of a little cooking oil and antibiotic, which can then be mixed with a pelleted food. A dose rate of 60-75 milligrams of oxytetracycline hydrochloride per kilogram of fish, fed every day for seven to 14 days, has been found effective in treating some bacterial diseases of fish.

Whichever method of treatment is chosen, it is important to use the full, recommended dose rate of antibiotic, for the prescribed length of time. As indicated above, the use of (for example) dose rates that are too low, may result in the occurrence of bacteria that are resistant to antibiotic therapy.

Many fish diseases are related to some aspect of incorrect pond or aquarium care. Thus antibiotic (or any other form of chemical) therapy is really only the first stage in long-

TROPICAL



Dr. C. Andrews

COLDWATER



Arthur Boarder

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.

term disease control. The underlying factors that brought about the onset of the disease (e.g. overcrowding, rough handling, poor water conditions, incorrect feeding, etc.) should also be investigated and eliminated. You may like to consult the following books:

"Textbook of Fish Diseases" by E. Amlacher (T.F.H. Publications, 1970);

"Diseases of Fishes" by C. van Duijn (Hiffe, 1973);

"Disease of Marine Aquarium Fishes" by M. P. Dulin (T.F.H. Publications, 1976).

C.A.

Coldwater**maintenance . . .**

With reference to the maintenance of a coldwater tank, I have seen it suggested that it should have a weekly servicing. What does this entail please?

Each coldwater tank should have a clean out once a week. This is best done on one particular day and is not then so likely to be forgotten. The front glass should be cleaned with a razor blade or a small piece of cleaning cloth on a stick. The fishes will probably eat any green algae which is removed. Once the matter has settled it is necessary to siphon up all the mulm which can be seen. If the tank was set up correctly, most of the waste matter will have settled in the very front of the tank. In removing the mulm about a third of the water will have been drawn up. This is thrown away. Then see to the water plants, pruning or removing any as necessary. Then top up the water to the top frame, clean the outside of the front glass and all is

finished. The task should not take more than half an hour. When cleaning the inside of the tank, do not touch the back and ends but allow them to become covered with algae.

goldfish food . . .

Can you give me a recipe for making a food for goldfish?

One can be made up with oatmeal, Bemax, dried shrimp, baked brown bread, minced up and, in fact, any type of cereal can be added. Mince all up to the size needed, store in a stoppered jar and this should keep well. However, I gave up making my own mixture years ago as there are so many very good flaked foods on the market that it is a waste of time making up one's own fish food. For pond fishes, there is little to beat trout pellets and the occasional brown bread crust is also appreciated. Garden worms are invaluable for most pond fishes.

shubunkins . . .

I am interested in obtaining some good quality shubunkins but my search at pet shops has been of little avail. Most looked damn sick and none appeared to resemble the pictures I have seen in goldfish standards. What is the Bristol shubunkin like please?

I can understand your dilemma. The illustrations of a Bristol shubunkin vary with different societies. The one illustrated in the booklet on standards by the Federation of British Aquatic Societies is based on the original standard set up by the Bristol Society and so should be the one to recognise. The trouble is that each society tries to be different from any other and so makes its own rules

to the confusion of many would be lovers of the true type.

which pump ? . . .

Can you please recommend a pump and filter for a tank, 38 x 12 x 14 inches?

I cannot recommend a pump and filter as there are several points to be considered, also as I have not tried any such appliances I am not in a position to give my opinion. The best course for you is to write for a catalogue from one or two of the firms advertising in *The Aquarist*. You will then be able to choose something to suit your purpose and also your pocket.

hood ? . . .

I have a small tank of goldfish but there is no hood. Is one necessary?

It is certainly necessary to have a hood so that it prevents dust from getting on the water. Also all tanks should have a lamp over-head or much of the beauty of the tank will be lost. A well set-up tank, adequately illuminated can be an attractive living picture.

A.B.

Plants**filtration . . .**

I think my tank holds about 82-88 gallons. What is your opinion on motor filters (is reverse-flow bad for plants?)

What you require from any type of filter is adequate filtration. If the filters do this satisfactory, then they will create the suitable condition for fish and plant growth. From what I

have seen so far, the motor filters appear to be quite satisfactory for this purpose. So are the other types of filtration. If set up and functioning properly they all achieve the same level of results.

lighting . . .

Is Tru-lite as good as they say? And how long, and what types of lights should I leave on for the best plant growth?

I have observed and found Tru-lite tubes to be quite satisfactory. The plant growth has been satisfactory both in freshwater and marine tanks when this type of tube was used. On the average, a warm white tube light of 20/30 watts should be kept on for about 10 hours per day. A tube of 40 watts should be kept on for 8 hours per day. The above lighting formula is only a general guide. The exact wattage and length and number of tubes or bulbs will depend on the size of the tank and the type of plants to be grown.

plant choice . . .

Could you suggest a selection of plants for my tank? The lighting will be a single 36 in. Grolux tube, the water in my area is very alkaline (8.2), but with peat it is possible for me to bring it down to 7.8, and the water is also very hard.

First of all let me tell you that your water condition is very alkaline, and even at a pH of 7.8 it is very difficult to grow the usual aquatic plants. Plants which are suitable for an alkaline tank are as follows: *Elodea densa*, *Myriophyllum*, *Potamogeton*, *Cryptocoryne ciliata* (true species, very tall, brown-leaved), *C. nevilli*, *C. lutea* and *C. wendtii*.

V.T.

Koi

winter feeding . . .

During the summer I have added a few small Koi to my collection of goldfish, shubunkins and orfe and all appear to be thriving so far. As I usually stop feeding my fish

in October for the winter I would like to know if this will be all right for the Koi?

There are two schools of thought upon this particular subject, to feed or not to feed throughout the winter and I believe in feeding, if and when conditions are suitable. I am sure that fish in the wild do not know they are not supposed to feed between October and April and carry on to some extent dependent upon temperature, species, etc. Much will be learned by observation and in a well-planted large pond there is usually some form of food available to those fish with an appetite and this is largely decided by water temperature. In small, possibly overstocked ponds, there is likely to be less natural food and some should be offered according to the activities, or otherwise, of the fish.

Pond fish usually stop feeding when there is a sharp drop in temperature, but will resume when even a slight rise occurs and this pattern can be repeated many times throughout an average British winter. There will be periods when the fish, through cold, will go into a state of hibernation; at such times they should be left undisturbed and precious energy not wasted. During a milder spell the fish will move about and, providing no frosts are forecast, a little sinking food can be offered in relation to the number and size of fish in the pond. Overfeeding must be avoided at all times, there is no surer way of polluting a pond.

There can be no hard and fast rules when there are so many factors involved but hopefully, commonsense and observation leads us to do the right thing.

I have no idea how small your Koi are, but if less than six inches then they will certainly need to feed through much of their first winter. They are unlikely to have any reserves and very often starved fish can develop fungus or other ailments in Spring.

Large, established Koi do have reserves but even so they feed at much lower temperatures than is generally supposed, but this is very much a matter of judgment only gained by experience. I hope for all concerned that a repeat of last winter's incredibly cold weather does not await any of us, or our fish.

H.A.

Marine

marine problem . . .

I have a 4 in. x 15 in. x 18 in. marine tank which is worked by four Eheim 1008 water pumps plus an air-driven protein skimmer in conjunction with a sander ozonizer, set at 10mg/03/per hr. The light is three x 4 ft. Tru-Lite power twist lamps and is on from 6 o'clock in the morning to 9 o'clock at night. The water is changed at the rate of ten gallons every month.

I have two sea anemones in the tank which is covered with bright red algae and I have been told that the tank could turn toxic. Could you please tell me if this is correct.

How can I dispose of the algae?

Your red algae problem is not uncommon and over the last few months since I have been writing this column, I have had similar marine problems sent to me. Generally speaking, the more simple algae of which the red algae is one, tend to prefer medium intensity light for continuous and extended periods, whereas the complex algae, commonly known as marine plants, do best under extended periods of lower light levels, but with short periods of up to 6 hours of extremely intense light. This in fact is what happens in the ocean, for much of the early morning and late afternoon sunlight is reflected from the surface of the sea, therefore very little of it is refracted into the sea. However, during the middle of the day when the sun is at its highest, the maximum amount of light is refracted and for this reason it is quite normal on a coral reef to find that the intensity of light during the middle of the day can be as much as ten times greater than early to mid-morning. So if at all possible I would suggest you change your lighting arrangement and perhaps have just one or two lights on for 14-16 hours per day, and then for between 4 and 6 hours per day as much intensity of light as possible. I firmly believe in the use of flood or spotlights for this 4-6 hour period. Another contributing factor to your red algae is the

type of nutrients that are available to it, and simply what has happened is that the red algae has become an integral stage of your filtration system and is carrying out many of the functions that a conventional biological filter would do. The great danger is of course that the algae is only really working when there is light on the aquarium and if your aquarium should experience an extended period of no light, the algae of course would tend to die back and at the same time cease its function as part of the filtration system.

So whatever change you decide to make, in my opinion it should be a gradual one. There are many algae eating Blennies that will eat red algae and I would suggest you add one of these to your aquarium. I am sure you will find them great characters and obtaining even a pair should be quite easy. The most commonly available is the bi-colour blenny (*Exocoelma pulcher*). A pair of these in your size aquarium should keep most the simple algae under control.

local marines . . .

Could you please advise me on the setting up of a local marine aquaria. At present my tank 30 in. 15 in. x 15 in. houses tropical freshwater fish. It is powered by a Rena, 101 feeding one uplift in an underground system and one poly-filter.

As I live by the sea and my boys and I are fascinated with the rock pools and their inhabitants specimens present no problem. What we cannot catch ourselves, can be purchased off the shrimp trawler men, or out of one or two of the fish traps in the area.

The questions I need answering are: (1) local water or synthetic? (2) is my '101' powerful enough? (3) will a U.G. 24 in. plate be sufficient? (4) How much light? bearing in mind the temperature must be kept low.

I am sure you will get great pleasure from starting up and establishing a good local marine aquarium. To my

knowledge I do not know any really good books on starting up a local marine aquarium, but I do know that one will be published later in the year and I have been fortunate enough to look through the draft script, and it would be just the thing for you. If you care to contact me in approximately 6 months time I should be able to give you the name and address of the publisher involved. In the meantime may I recommend to you a marvellous American book just recently written and published entitled 'The Marine Aquarium Handbook from Beginner to Breeder' by Martin A. Moe, Jr. I am sure it will be of great help to you as it is orientated very much to the establishing of a local marine aquarium in the United States and needless to say many of the problems are much the same. Particularly regarding the treatment of natural sea water. It clearly outlines a sequence of operations for preparing natural sea water to make it completely safe. As regards your filtration system that you plan to use. I am sure it would be adequate as long as you keep your population levels reasonably low. Of course if you wish to increase those levels at any time you will need some form of additional filtration.

The major problem with maintaining a coldwater marine aquarium is one of temperature and for this reason do take great care in using as cold a light source as possible. The intensity of light required in a cold water marine aquarium is nothing like as great as that required on a tropical marine aquarium. Even so overheating, particularly in the summer time, will be a problem that will prevent you from getting certain deeper water species. On a larger scale public aquaria they of course use reversal systems, but I am sure you will agree it is not really practical on a small hobbyist level.

R.S.

Discus

pH too high . . .

I have just set up a 39 inch aquarium specially for Discus fish

and will use a 150 watt heater/thermostat, undergravel filter, Gro-Lux lighting. As decorations I will use pieces of slate and bogwood roots and I would like to know whether I can use peat under the medium sized pea gravel. My pH in the aquarium is 8.5 whereas the pH from the tapwater is only 7. I know that the pH is too high and I hope that you can suggest a chemical to bring the pH down.

The problem you have with the pH in your aquarium is as a result of the pea gravel and there is really no chemical you can use to bring it down. It would be a much better idea to change the pea gravel for a lime-free gravel and you will find that not only the pH but also the hardness of the water will be more stable. As you probably know, Discus fish would not be very happy in such a water and it would be unwise to introduce them into this set up. I am also completely against using peat under the gravel bed; peat is a very good filtering material for a Discus tank—as well as for many community tanks, but should only be used where it can be changed frequently: in either a power filter or inside box filter. Although I believe that U/G filters may have a function in the fishkeeping hobby, they do not fit into a Discus set up and I suggest that you change your filtering system to one which will be above the gravel bed and when it becomes dirty or clogged it can easily be removed and cleaned. My advice to anyone interested in starting with Discus has always been to have the best filtering system money can buy and this means a power filter and in the long run would mean money well spent.

E.S.

Press Release



Fight fish diseases with Tetra

WHENEVER animals are kept under any sort of intensive or crowded situations, outbreaks of diseases become all the more common. When fish are reared on fish farms, or kept by aquarists in aquaria or ponds, many of the diseases reach their true potential for causing harm. As we find out more and more about the pond and aquarium fish we keep, it is clear that they are subject to a huge range of diseases—but infections such as fungus and white spot still cause problems time and time again.

Fungus

The skin of fish has a mucus covering which is a very effective barrier to disease agents such as fungal spores, the latter of which are very common in

water. However, if this mucus layer becomes damaged (following rough handling, fighting, other parasite infections on the skin, etc.), the ever present fungal spores may seize a foothold, penetrate deep into the muscle of the fish, perhaps even causing death.

The signs of fungal attack are quite obvious—white or grey/brown cotton-wool like growths on the skin and fins of fish. Prompt treatment is vital and may be most easily achieved by the addition of a reliable fungal treatment such as *FungiStop* to the aquarium water. Pond fish suffering from fungus should be removed to a separate tank for treatment.

Fungus may also attack fish which are in poor condition because of poor aquarium management (eg., overcrowding, inadequate filtration, infrequent partial water changes, incorrect nutrition, fluctuating temperatures, etc.). Preventing this type of outbreak of fungus lies in the hands of the aquarist. . . .

White spot

White spot disease ('Ich') is caused by the tiny protozoan parasite, *Ichthyophthirius multifiliis*. The parasite sits on the skin, fins and gills of fish, just beneath the outermost layer of skin. Eventually it falls away from the fish host and, on the bottom of the aquarium or pond, divides many times to release thousands of 'swarmers.' These swim off to infect another fish. If they do not find a fish within a few hours, they will perish. The life cycle of the 'Ich' parasite turns over much quicker at the warm temperatures of a tropical aquarium, and the fish-to-fish transfer of the parasite is made easier by the relatively overcrowded conditions in most tanks.

Whilst white spot is a very common and very damaging parasite, diagnosis and treatment is easy. The parasite appears as small (up to one millimetre) regular or irregular 'spots' on the fish, giving it the appearance that it has been

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COMMENTARY



by
Roy Pinks

FOR SEVERAL seasons past I have experimented with various possible answers to the constantly recurring question of how to cope with pond leaks. As recorded in earlier articles on this subject I think I may lay claim to more success than failure.

In the case of concrete ponds owners often leave the treatment far too late, and the cracks may, on examination, be found to have proceeded past the stage at which repair is worthwhile, since even though the water may be contained for a period, a permanent bond cannot be achieved. Therefore, all cracks, even hairline ones, must be filled in as soon as detected, and there is a wide range of products from mastics to rock-hard material which will prove to be reasonably successful. But do give them a fair start: it is quite useless to apply any treatment to wet or dirty surfaces, and as most pond interiors are algae-ridden and sometimes crumbly, a thorough scrubbing and washing of the damaged areas will prove to be necessary (with the pond inmates and furnishings meanwhile in temporary quarters elsewhere).

One invisible cause of pond leaks is the insidious intrusion of tree roots. Poplars and willows are notorious

offenders, their roots constantly seeking out available supplies of water and pushing relentlessly through every type of barrier separating them from their goal. The foundations and sides of many pools are damaged by the assault of the common Weeping Willow, which is a completely wrong choice of tree for small gardens anyway, so it is well to resist the temptation to plant cuttings from it near any domestic pool.

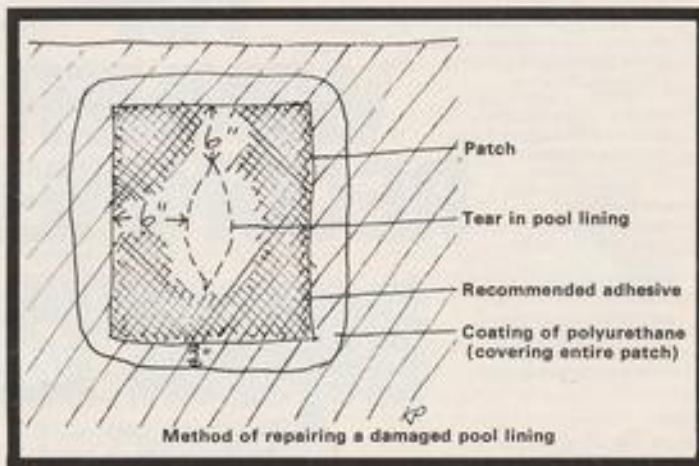
Plastic liners

Plastic-reinforced fabrics like Plasto-lene comprise the lining for many thousands of ponds throughout the country, and they are extremely hard wearing and long lasting. Damage to these rarely stems from breakdown of the material due to weathering, but more often from physical attack like airgun pellets, misdirected garden forks and tree roots. Areas weakened by severe frosting or sunbaking may also be penetrated by insects like ants and woodlice, etc. Most holes or tears can be patched, using the same type of material as that which forms the pool. A wide overlap (6 in. if practicable) should be allowed for, and Bostik No 1 is the recommended adhesive. I have used Evostik, too, but rather less successfully.

The materials to be connected must again be dry and clean, and repairs are

the ideal undertaking for a warm summer's day with the barometer set fair and rising. Once the patch has been made it should be left for 24 hours before water is re-introduced. Thus far, I have found these measures more or less satisfactory, but I have always been concerned by what I consider to be the weakest spots, viz the entire extent of the perimeter of the patch. Almost any movement tends to encourage the patch to curl up and away from the pond lining, and this will be exaggerated in the waterline zone, which is the very area in which most of the trouble begins anyway. I originally tried painting this with the thickest bitumastic paint I could lay hands on. Then I tried roofing felt cement, a particularly gooey concoction which took longer to dry than I would have wished.

More recently the excellent Cuprinol mastic crack filler in the No More Damp series has continued to give lasting results, and it is attractive in that it hardens to a point at which water can be re-admitted within 48 hours or so. Nevertheless all this failed quite miserably on a pool I treated this summer, and I had to look hard at the technique once again. In this particular



COMMENTARY

case I had to join up some 8 feet of sheeting, admittedly an unusually difficult job, yet one to prove any given method right up to the hilt! At first attempt I used Evostik and No More Damp, but because of a small spot of dampness in the jointing area the whole seam failed: water got under the Evostik film and gradually forced the top sheet away from the lower one. At the depth concerned the mastic filler, which had probably not dried out sufficiently, was unequal to keeping the water away from the seam.

Polyurethane

On the evening of this misfortune I happened to be rearranging some tins of decorating material, amongst them some polyurethane clear liquid which I had used to seal some cork floor tiles, and this gave me the idea that it might prove to be just the thing I was looking for—a completely watertight and flexible coating to the Plastolene seams. This time I used Bostik No 1 as the adhesive and I then treated the seam, as before, with No More Damp. I allowed this three days to set and then applied two coats of the polyurethane liquid, which formed a glass-like gleaming seal about 2 inches in width. From the outset this looked good and promised well. It set rock hard and I gave it two days to settle. The pond was then filled and has remained so for

the past three months.

Somehow I feel more confident about this than any previous treatment, and I see no reason why a similar seal could not be applied to concrete pools, too, once the cracks have been filled in conventionally. The shortcoming which this seems to have overcome is the difficulty of achieving a satisfactory keying of sealer with the Plastolene: fibreglass, for example, seemingly an excellent candidate, will peel off within minutes. At any rate there is increasing optimism that pools constructed with high quality flexible linings are amenable to simple repairs, and that these may be relied upon to serve for a number of seasons, probably only needing inspection and upgrading when the pools are emptied periodically for the recommended cleaning.

PRESS RELEASE

Continued from page 28

sprinkled with sugar or salt grains. Prompt treatment is important, since if the disease is left to progress secondary infection with fungus or bacteria may occur. It is only the parasite stages away from the host which are susceptible to treatment and hence any chemicals must be added to the water of the infected aquarium. *ContraLek 80* is a very safe but effective treatment against the white-spot parasite, and may be used to treat fish which are sensitive to other chemical treatments (eg. clown loach, scale-less catfish, etc.).

General tonic

From time to time, fish may exhibit a range of relatively non-specific symptoms, including split or frayed fins, reddening to the body, rapid gill movements, listless behaviour, loss of appetite, etc. In such situations the first thing to do is check water quality (especially nitrite content and pH) and ensure that the tank has adequate

aeration and filtration. Very often the above symptoms are related to parasite or bacterial attack, brought on by poor conditions in the aquarium.

The organisms responsible for these symptoms may be treated with a broad spectrum treatment such as *General Tonic*, the beneficial effects of which may be enhanced by the addition of 1-2 teaspoons of aquarium salt to each 10 litres of water. Aquarium fish may be treated in the set-up tank, although badly affected aquarium fish and pond fish should be treated in a separate isolation tank. As always, it is vital to identify and correct the underlying causes of the problem (eg., overcrowding, poor filtration or aeration, infrequent water changes, etc.).

Newly imported fish often exhibit the above symptoms, along with obvious signs of physical damage. In such situations, or when dealing with fish which have become damaged as a result of fighting or rough handling, a combination of *General Tonic* and *AquaSafe* may be very beneficial.

"The *Tetra* treatments are back—so don't forget—

- for fungus, it's *FungiStop*.
- for white-spot, it's *ContraLek 80*.
- for fin rot, it's *General Tonic*."

Each treatment is sold in a 100ml bottle with a recommended retail selling price of £1.80.

Press enquiries: Christine Warwick, Eastleigh (0703) 619791.

Technical enquiries: Dr. Christopher Andrews, Tetra Information Centre, 15 Newlay Lane Place, Leeds LS13 2BB Telephone: (0532) 555980.

DISCOVER THE FISH

By Pisces—

The first is in GARDEN but not in HOSE

The second is in CUTTING but not in MOWS

The third is in FISH but not in KEEPER

The fourth is in HARVEST but not in REAPER

The fifth is in SPAWNING but not in FRY

The sixth is in SEEK but not in PRY

The seventh is in FILTER but not in PASS

The eighth is in LAUGHTER but not in FARCE

The ninth is in WORMS but not in EELS

The last is in SEA-LIONS but not in SEALS

IOGINHSIN



Coldwater Jottings by Frank W. Orme

As I type these words during a fine sunny October morning, I wonder whether the weather will be as kind when they appear in print? We in Britain never expect conditions like those of last year, and when they do occur, are nearly always unprepared. Although I was fortunate and suffered no losses of fish, I know that others were not so lucky; many outdoor pet-fish became casualties of the very severe winter. Experience, and weather-experts, assure us that last winters' arctic-like conditions were an exception—I only hope that we are not given a repeat performance.

Bristol Aquarists' Society staged their annual Open Show for coldwater fish during last September and, apart from local interest, attracted visitors and exhibitors from far afield. Aquarists from areas such as London, the Midlands, Lancashire and Scotland entered fish to boost the total number of entries to 461. The largest class was for the 5 inch Bristol shubunkins which had 40 fish on display. In all, 57 exhibitors entered fish in the show, the award for Best Bristol shubunkin being taken by Mr. T. Ball, whilst Mr B Rothwell was awarded Best Exhibit in Show for his team of four 1982 bred veiltails.

B.K.K.S. Magazine

The September issue of the British Koi-Keepers' magazine was outstanding for its report on the 'Koi 82' Open Show. Not only did it contain the usual details of the various award-winners, but it also contained photographs of sundry events, accompanied by humorous captions. Most striking, however, were the colour plates of the winning fish—21 in all—depicting some truly eye-catching koi. The Best Ogon, which was also adjudged the Grand Champion, was a beautiful specimen owned by Mr. J. Wilkinson.

Earlier this month (October) I attended a meeting, at Coventry, of the Association of Midland Goldfish Keepers at which a number of visitors from the Bristol Aquarists' Society were present. Amongst these visitors was Mr. Jim Day to whom the A.M.G.K. members listened with rapt attention as he described his rather unorthodox method of feeding his young goldfish. Jim is becoming well known for the large size to which he grows his young stock, and was prevailed upon to give an impromptu talk about his methods. I suppose it could be said that 'four-esses' are the governing factors behind his success; space, salt, sugar and siphoning.

Plenty of growing space, it was stressed, was a prime essential to allow the fish to make satisfactory growth; crowded fish meant stunted fish. A variety of foods are employed but, most surprising of all, from an early age a tablespoon of white sugar is sprinkled into the tank. Jim claimed that the small fish benefit greatly and that it is the addition of sugar which encourages the excellent growth rates of his fish. In order to satisfy himself on this point, he had conducted tests by raising two batches of fry under identical conditions the only difference being that one batch were provided with sugar and the other was not. Those which received the sugar grew much more rapidly than those which were treated to conventional feeding. Apart from the sugar he also liberally doses his 5 ft. x 18 in. wide tanks with a good handful of rock salt every morning. In view of the fact that both sugar and salt would lead to harmful conditions if allowed to build up in strength, the bases are siphoned over every evening, without fail, at the same time removing no less than twenty-percent of the water—this is replaced with fresh

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BEADLET ANEMONES

FOR THE MARINE AQUARIUM

by Andy Horton

BEADLET Anemones, *Actinia equina*, are not plants but a primitive invertebrate, and a carnivorous animal. When submerged the cylindrical body is partly hidden by nearly two hundred (192) poisonous tentacles that flow out gracefully to trap unwary prey. Out of the water the tentacles retract and the anemone looks like nothing more than a featureless blob of jelly. Colours vary from the richest Burgundy red to a profusion of browns and greens, and include a spotted type that resembles a strawberry. The popular name is derived from the blue beads (acrorhagi) that are arranged in a ring near the parapet at the top of its column, and are normally hidden from sight.

Our own shores are a rich hunting ground for the Beadlet Anemone, where it can be found at low tide on rocky coasts, and even on groynes in some sandy areas. It is abundant in suitable sheltered habitats reducing in frequency as the degree of exposure increases. On pebble beaches where the fierce action of the waves creates a desert where no life exists, the anemone is absent. Otherwise, under stones, in rock pools, submarine caves, attached to overhanging boulders, adhered to red and brown seaweeds, amongst the mussel beds in fully saline creeks, on all shores of the British Isles, it is plentiful.

For a sedentary creature the world distribution is phenomenal, the known range stretching from the Kola peninsula on the Arctic coast of Russia to the tropical Gulf of Guinea in West Africa. It is notably absent in the Baltic and the approaches, being unable to maintain a population in brackish waters. It can be found almost anywhere on the shore and in the sub-littoral zone, although the principal location is midway between the low and high water marks. Specimens for the aquaria should be removed by carefully inserting a fingernail underneath the base and peeling the anemone from its attachment. The tentacles will feel slightly tacky to the touch.

A wide tolerance of conditions augurs well for its success in captivity. It is virtually indestructible in the native marine tank and the strawberry coloured variant can easily reach dimensions in excess of those found on the coast. Even the largest Beadlet is compatible with most forms of life of interest to the aquarist, although small fish accustomed to swimming in mid-water over sand may become distressed if they are unable to find refuge from the stinging tentacles. Sandhoppers, *Talitrus saltator*, seem to be unable to avoid these hollow appendages that paralyse this miniature prey and pass the food through a slit like mouth into a large gastric

cavity. Small crustaceans form a large part of the intake, supplemented by fish larvae and worms. The largest Beadlets are found on mussel beds and the flesh of this mollusc undoubtedly becomes a major food item. Indeed, boiled mussel flesh is a suitable aquarium meal.

Frequently the anemones will be hidden in crevices or concealed between inaccessible rock faces. They are not attempting to hide but choosing the best feeding station. A considerable part of their diet is borne by the movement of the tides and their powers of movement are usually limited to judiciously creeping into a spot where they can obtain sustenance from the ebb and flow of the waters. Because during the Winter the planktonic organisms are often scarce, Beadlets have to endure months of poor nourishment and even starvation, when they dwindle to a fraction of their Summer size. They are also able to loosen their adherent base and allow the tide to propel them to a different location. This explains their wide range within an intertidal area. In aquaria they will climb over the glass sides.

Conceivably, in the still waters of a rock pool, free swimming creatures will wander into the tentacles. However, there are two reasons why this is unlikely. Firstly, in still waters there is very little movement. It seems that the inhabitants of these areas are only stimulated to move when the incoming tide cascades over the pool. They spend the tranquil intervening period seeking shelter. Secondly, prawns and such like have evolved to resist the entrapment of the tentacles. Tentacles that will extend in an active search for prey. Beadlet Anemones are also empowered to alter the shape of their column when their isolated sense cells detect the presence of food.

After a large morsel has been dispatched down its tubular gullet, the anemone may contract for a period of up to an hour. Afterwards it will expand to its fullest

extent whilst it completes its digestion process. Days later, the waste will be expelled through the mouth, remains that should be removed to avoid polluting the tank. In the wild the action of the waves will clear this debris and in the aquarium they appreciate a gentle cleansing action, taking care to avoid stirring up the humus in the gravel. Alarmingly, the Beadlet may dwindle to a quarter of its former size and wither into a woeful and unhealthy appearance to such an extent that you think that it is dying. This extraordinary behaviour is normal, and by the time the aquarist has debated what to do, the anemone will have returned to its original splendour.

More often than not, the conspicuousness of a creature advertises its inedibility, and this

Beadlet Anemone (Green)

is true of the Beadlet. It is distasteful to fish, crabs, prawns and seagulls. The only animal that preys extensively on this anemone is the beautiful Grey Sea Slug, *Aeolidia papillosa*, an solid mollusc with plumes matching the colour and containing partially digested remains of its food. Other Sea Slugs are predators, notably the Crowned Aeolis, *Facelina coronata*. The small sea spider, *Pynogonum littorale*, is found in conjunction



Beadlet Anemone (Strawberry type)





Beadlet Anemone (Intermediate form). Periwinkle in right of picture



Beadlet Anemone (Brilliant red). Anemones close together will usually sting one another, especially if they are of a different colour



with the Beadlet and may feed on it. Internal parasites are sufficiently numerous to justify a warning about keeping this anemone in a tropical marine aquarium because of the great danger of infecting any companions.

Conjecture regarding the breeding of the Beadlet Anemone means that it would require a complete article to elucidate the facts. They certainly increase in number under artificial conditions, as the materialization of miniature counterparts of the adults testify. This subject first attracted my attention when a medium sized (2 cm. base diameter) specimen adamantly refused to open its tentacles, even when offered choice items of food. The forty or so others were expanded so I decided to transfer the anemone to another tank and observe the reaction. It was far more than I expected. A half a dozen replicas of the adult form wafted through the singular opening, stimulated by the shock of moving. This common occurrence led to the widely held

hypothesis of viviparous reproduction; that is, the eggs develop into larvae within the body of the female. Recent research¹ proves that this is not the principal method and may not occur at all. Briefly, germ cells develop within the anemone and when ripe are shed into the sea. Whether fertilization is internal or occurs in the sea is problematical. Ciliated larvae then grow to form part of the plankton, and when they are still small, but beginning to look like the adult form, will return to find sanctuary within a fully grown anemone for the final phase of development.

Even the spectacular colours of the Beadlet are exceeded by other anemones found on British coasts. The photographs should enable you to make a positive identification, but in cases of doubt it should be noted that the pale blue to brilliant ultramarine beads (acrorhagi) usually ranging in number from 12 to 48, are only blue on this anemone. The magnificent Dahlia Anemone, *Tealia felina*, is widely

found, larger than the Beadlet and often hidden amongst sand and covered with shells and gravel. The Plumose Anemone, *Metridium senile*, from pier piles and rocks in shallow waters is not hardy and will expire unless great care is taken. The Sagartia family of anemones from the low water mark area can easily be kept. The South West peninsula is the best British hunting ground and a diligent collector may be lucky enough to find ten different species for his aquarium.

REFERENCE:

¹Journal of the Marine Biological Association Feb. 1970.

GLOSSARY:

Sub-littoral: submerged shore zone, shallow water below low tide mark.

Crustacean: crusted animals with an external skeleton, such as prawns and crabs, including copepods.

Mollusc: a group of animals with a soft body and hard shell, such as mussels and winkles, but also include cuttlefish etc., with an internal shell, and the Sea Slugs (nudibranchs) some of which have no shell.

Eolid: suborder Eolidacea.

BEADLET ANEMONES *Actinia equina*. Major Colour Variations (Shoreham-by-Sea, Sussex)

Colour of Column	Line on column circumscribing base	Base	Tentacles	Size (Base diameter)
(1) Crimson Small varieties are often brilliant red, a rust-red tinge is common	Blue	Crimson sometimes purple	Crimson, pinkish Brilliant red when small	Up to 3½ cm.
(2) Green Large varieties with faint vertical yellow lines	Blue	Green	Green, as column	Up to 4 cm.
(3) Brown with greenish tinge, some turning green, others persistently retain a chocolate brown colour	Green	Green	Brown. Orangey-brown when small	None larger than 1½ cm.
(4) Strawberry-type Crimson with distinct green spots.	Green	Light brown	Crimson, pink, cream	6½ cm in one aquarium specimen

THE 31ST BRITISH AQUARISTS' FESTIVAL, 1982

THE Belle Vue complex of yesterday is no more, the Zoo, Funfair and sideshows all having vanished into limbo. Throughout the time that the B.A.F. has been staged at Belle Vue—and that is since its inception—it has enjoyed a spin-off from those non-aquarist patrons of Belle Vue entertainments who included the Festival as part of their day's outing.

There were those of us who thought, gloomily, that attendances at the Festival would be noticeably depleted without the very many casual visitors but after a moderately well filled hall on Saturday, Sunday's attendances had to be experienced to be appreciated and the gate figures, when known, should afford great satisfaction to the organisers. Crammed to capacity by mid afternoon, it became extremely difficult to squeeze through the crowds and for those manning the stands it was politic to remain *in situ*.

A never ending source of amazement arises from the ingenuity of the tableaux whose designers and builders are to be congratulated on their ability to come up with new ideas year after year. Animation is an increasing factor, some of the tableaux providing incessant movement while others spring into action

at the touch of a button requesting the viewer to 'press.' One such was the winner of this competitive event. Comprising a booth entitled 'The Magic of Fishkeeping' it featured a man-sized rabbit, suitably attired in conjurer's garb, which lifted a black cloth from a bare table, replaced it and then lifted it again to reveal a small aquarium containing fish.

Bridgewater Aquarist Society entered a tableau of a Mars-scape entitled Life around the Canals of Mars. It was peopled with gyrating gonks ensconced in craters, and little green men, while rockets landed, scanning devices whirled and probed and a ghoulish figure chased egg-eating creatures.

Trade stands provided the widest range of livestock, plants, aquarium equipment and books and aquarist societies displayed their competing fishes in the accustomed neat and compact stands.

The Champion of Champions event was won by a *Pimelodella blochii* competing with a range of multi-sized species, the largest of which was a beautiful Indian snake-head (*Channa micropeltes*). Another *Pimelodella* species, *P. albofasciatus*, won the award for the Best Fish in Show.

A new competition was for Handicrafts and among the entries were some excellent wood carvings of fish executed by Brian Walsh, while the Children's Painting competition provided a colourful wall decoration.

Halifax A.S. displayed their usual neat, box-shaped stand with no pretensions of being a tableau but with concentration on fish and on furnished aquaria and they secured, four first, a second, and five third awards. Of these were the Society, and the Individual Tropical Furnished Aquaria for each of which Halifax A.S. obtained both first and second awards as they

did for the Society, and the Individual Furnished Coldwater Aquaria. David Shields was responsible for the Individual classes. He has been involved since becoming a Junior Member in 1953 and has since won the Cussons Trophy nine times and the Walter Smith Coronation Shield four times.

The B.K.K.S. displayed their usual pond-sized containers with huge, multihued, mouth-watering Koi gliding around like a kaleidoscopic flotilla of submarines.

A tremendous amount of hard physical work goes into an exhibition of this sort, plus a year of mind-blowing assembling of data and attention to detail on the part of the organisers, and Mr. John Hall and his team are to be congratulated on their achievement. In this connection Mr. Philip Moorhouse, Chief Steward, wishes to express his heartfelt thanks to his fellow stewards and all others involved.

It remains only to wonder whether next year's show can possibly exceed this year's in its smooth running, friendly rivalry and spectacular presentation.

Laurence E. Perkins

Full competition results in next months issue.

Captions for photographs on next page . . .

- 1 The winning tableau from St Helens A.S.
- 2 First prize for this individual furnished aquarium went to David Shields
- 3 This working model of a 'pipe organ' won third prize for Darwen A.S. in the tableaux section
- 4 A frightening 'Dragon' emerged from the castle built by members of Sandgrounders A.S.
- 5 Mr T Cruickshank receives first prize in the 'Champion of Champions' contest from Mrs Peggy Lee
- 6 An auctioneer in action from Huddersfield A.S.
- 7 A selection of entries in the Childrens Painting Competition.
- 8 Martin Carter receiving first prize in the 8-11 years section of the Childrens Painting Competition



2



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From a
Naturalist's
Notebook



RESEARCH is still a variable cost. Latest grants notified by the National Environmental Research Council include £6,775 for a 3 years study of the effects of environmental stress, the respiration metabolism and swimming activity of fish by Prof. G. M. Hughes of Bristol. £1,100 goes to two Exeter University biologists for radio-tracking studies over a year of relations between declining native otters and increasing alien mink, and £13,599 to 2 years' study by Dr. P. Calow of Glasgow University on the temperature effects on feeding and life cycle of the freshwater planarian worms *Dugesia lugubris* and *D. polychroa*. £25,863 goes to Dr. R. Goulder's 3 year study at Hull University of the development of bacterio-plankton in headwater streams. £2,298 goes to a 2 years Chelsea College study of the part ciliates (microscopic life with cilia or mobile tails) play in the chemistry of eutrophication or "breaking" in the Shropshire-Cheshire meres and £1,400 for 2 months London School of Hygiene work on keys for the identification of British mosquitos.

At Plymouth Polytechnic a 3 years further study of furunculosis disease in fish (salmons) receives £12,041 and £18,343 is for 3 years study of British corals. At St. Andrew's University, Prof. D. H. Spence's 3 years study of light control on growth of marestail in freshwaters earns £28,611, and at Southampton University Prof. Sleight's 3 years study of amoeboid protozoa in streams earns £28,052. £28,244 covers a 3 years Bangor, North Wales study

by Eric Hardy

of the tidal rhythmic behaviour of common shore-crabs, by Prof. Naylor.

Incidentally, there is now concern among leading fish-biologists that our native stocks of wild salmon may be weakened and made more placid, or less active, by breeding with many crossbred salmon used increasingly in fish-farming and liberated in several rivers. The vigour of our salmon is necessary for their tough migration upriver from across the Atlantic. Most rivers had a poor migration of salmon and sea-trout in 1982.

I was on the Solent watching oyster-dredgers opening the season last November after many oyster-beds in one shallow Falmouth creek up the Percuil River, had been decimated by the first outbreak known in British waters of the parasite *Bonamia*, known as Parasite X. This has caused heavy oyster losses in France and Holland in recent years, and must

have crossed The Channel. Despite restrictions on oyster-movements from the continent, the parasite is more likely to arrive in contaminated specimens, maybe storm-driven, than by birds like oystercatchers which feed on young shellfish. At Newtown estuary reserve, I was shown beds of American clam which has become established there, it is claimed, from casually discarded clams from passing U.S. ships. But this mollusc has long been used for experimental introductions in British waters.

Advantage has been taken of the mildness on the Isle of Wight to introduce alien reptiles and amphibians. I was looking at some ponds above Brook, a hamlet on its south coast beyond Freshwater where African clawed frog tadpoles were introduced about a decade ago, where the island's climate is remarkably mild. The first European green tree-frogs in Britain were introduced over 140 years ago on the island at Undercliffe, St. Lawrence, and again early this century; but they seem to have died out. So did a more recent introduction at Mottistone Mill at Brighthelm.

There are colonies of wall-lizard near Ventnor and La Palaise, and a few European pond-tortoises or terrapins are said to survive in ponds near St. Lawrence. But the majority of introductions were short-lived and the new Countryside & Wildlife Act now makes this illegal without licence. Liberating wall-lizards seems to have been a pastime of many islanders, as was the introduction of exotic plants.

As most photographers learn, British wildlife is rather short of reds apart from a few like the red *Sympetrum* dragonfly, rudd and blood-worms. We tend to regard the colour as typical of deep sea prawns, lobsters and fishes. I was surprised at the range of red in North America where there is a red phase of the American toad, as well as a normal red-spotted newt and a northern red salamander. The Appalachian woodland salamander has red legs. Their eastern garter-snake has a red belly and the scarlet king-snake and Louisiana milksnake are banded with red. This probably serves

as a warning colour to predators, as in our red insects.

Their red skimmer dragonfly seems to be redder in body and wings than our several red dragon and damselflies. I've mentioned before seeing our red *Sympetrum striolatum* or red darter on the wing in November, the latest of our dragonflies. Last October I came upon a score hovering and fighting rival males for their aerial territories over a pool in our local dunes. They were mating with females and, still flying in tandem, dipping in repeated egg-laying for an hour. Then the sun was clouded-out and they all

left to roost. I walked across to other duneland pools and found all their dragonflies had retired to roost under duller skies. This red dragonfly also breeds in brackish water in a Dee estuary tidal marsh at Red Rocks, Hoylake corner, as it used to breed on the former brackish pool at Leasowe Embankment up the coast, until this was drained. East Anglia of course is our stronghold of dragonflies, but even there they are endangered by pollution and drainage.

Coldwater Jottings

Continued from page 34

water drawn direct from the main supply. Jim stops feeding sugar when the fish are three months old, at which age they receive only conventional foods.

Sugar

There was some debate, and a number of questions asked, about the use of sugar and I felt sure a number of people decided to try Jim's methods, especially when he assured them that his fish were not weakened and some—veiltails—had spent last winter in very cold conditions without coming to any harm. To one questioner, he replied that his methods had not had any ill-effect upon the vigour or spawning capabilities of either males or females; in fact, he remarked, he had fish spawn when only four months old. This latter statement was confirmed, in a whispered aside,

from a fellow Bristol A.S. member! Although I listened to this talk with some minor reservations, there is no doubt that Jim is a successful fish-keeper and breeder of fancy goldfish; the proof was evident at the Bristol show where he gained first, second and third places in the class for veiltails bred during 1982; took all four places with his 1982 bred orandas, plus awards in other classes, and one can hardly argue in the face of that sort of success. I shall be interested to learn whether any of the A.M.G.K., members try the methods which Jim Day advocates, and see the results.

For most coldwater fishkeepers January is a month when there is little to do in pursuit of the hobby; nevertheless, those who hope to breed their fish in the coming months will, no doubt, be planning which fish to select for spawning. Some, who wish to get an early start, may even apply a little artificial warmth to encourage the fish to commence feeding. The beginner, however, would be well advised to delay such activities for a little longer. At the present time the hours of daylight are still short; the sun, when it shines, is weak and livefoods are scarce. March and April will give a far better chance of success when it comes to

raising the young. Early spawnings will require prolonged heat, if they are to feed properly, and a fair amount of reliance will have to be made in the provision of non-livefoods. The heating Bill could prove quite costly, and a degree of expertise is necessary to ensure a sufficiency of the right type of nourishment whilst avoiding the problem of overfeeding and possible pollution of the water.

Higher temperatures

A late start offers a number of benefits, especially to beginners, not least being the higher temperatures. Even so, if the fishes do become active, and appear to be seeking food in their tank, it will do no harm to offer a small amount of chopped earthworm. Be sure that it is eaten within a short time, removing any which has not been consumed within, say, an hour—normally uneaten food is removed after ten minutes—this allows ample time for the sluggish appetites to perk up. These small meals will help to condition the fish, but they should not be overdone nor should the fish be fed during a prevailing period of very low temperatures. At temperatures below about 45°F. (7.2°C.) the beginner would do better by withholding all food.



SPOTLIGHT

THE BLACK NEON

by
Jack Hems

Photography by
A. van den Nieuwenhuizen

THIS species, bearing the scientific name of *Hyphessobrycon herbertaxelrodi*, was introduced to tropical aquarium keepers sometime in 1960. It is native to the Rio Tanquary, Brazil, and is a member of the family Characidae.

The popular name of this fish is something of a misnomer; for the epithet conjures up a picture of a fish of neon-light brilliance whereas in actual fact the species is devoid of bright colour—that is if the aquarist excludes the splash of red in the upper gold rim of the oily black eye. For all that, *H. herbertaxelrodi* more than makes up for this deficiency in a number of ways.

First, it is a small and peaceable fish that attains a maximum length of about 1 in. These two qualities alone make it ideally suited to a community tank housing a collection of the smaller inoffensive fishes. Then again, it likes to swim with its own kind and form a school—and let it be said at once that a school of black neons moving to and fro in the middle and upper levels of the water (its favoured position) is a lovely sight. It is long-lived (five years and upwards) and can withstand a fairly wide range of temperature, namely from about 70°F (21°C) to 86°F (30°C) without adverse effect. Ordinarily, a temperature of 75°F (24°C) suits it well. And one must omit the fact

that, it is not faddy about its aquarium water provided it is clean and is not inclined to overmuch acidity or excessive alkalinity or dissolved mineral matter (the wrong sort of rockwork is a point the novice fishkeeper must bear in mind). In general, then, soft or neutral water, well-oxygenated, and giving a slightly acid reaction agrees with this species' uncomplicated demands as well as any. Topping up the tank with boiled mains water, left standing in a plastic or glass container for a day or two (to absorb atmospheric oxygen) is advised to make good any losses brought about by cleaning or evaporation. It is of supreme importance to note that all fresh water added must match the existing tank water temperature.

The back of the black neon tetra is greeny brown to olivaceous greeny grey gradually merging on the middle side to an off-white or ivory-white stripe that runs from the eye to the tail base. A broader stripe of intense black underlines the white marking and extends to the widely bifurcated caudal fin. There it spreads into the rays which, ordinarily, keep the hyaline membrane opened out. The major part of the body below the horizontal stripes is blackish blue giving way to olivaceous green posteriorly and silvery white anteriorly. The under-

parts are leaden grey overlaid with silver, or silvery white. The head is patchy with black, greeny brown and hints of beige. The fins have little colour.

Sexing grown fish is no great problem. Females can be picked out by their heavier build or, put another way, all-round slightly larger size. Breeding takes place if a true pair or, for that matter, several true pairs are placed together in a tank of about 9 gal. capacity (18 in. x 12 in. x 12 in.) or above. The water in it should approximate in chemistry and temperature the water in the 'home tank.'

Prior to introducing brood-fish into the breeding tank, it is recommended to feed them little and often on nourishing live food such as screened *daphnia*, common gnat larvae (plenty to be found during the warm months of the year if a dish or basin is placed outdoors to catch rainwater), miniscule fragments of raw red meat, and a top grade flake food.

If everything goes forward as planned, the female of the species should soon develop fuller sides, the male a stronger coloration and noticeable interest in the opposite sex.

The reproductive instinct aroused, *H. herbertaxelrodi* spawn in clumps of delicate-leaved foliage. Therefore it is incumbent upon the



aquarist to sink bunched sprays of fine-foliaged underwater vegetation to the bottom. (A carpet of spotless grit or sharp sand spread over an uncovered glass floor will preclude diamond-bright reflections diverting a couple's attention away from spawning). However, to move on. After the brood-fish have been placed in the prepared tank, preferably last thing at night, adjust the thermostat to allow for extra heat to

flow into the water and so raise the temperature gradually to a few degrees (°F.) above normal. There is, however, no guarantee that the fish will spawn the following day. Perhaps 36 hours or more will pass before they get used to their new surroundings. All the same, we must not forget that their natural instincts usually respond to a rise in temperature and the inviting proximity of bunched vegetation. Almost always, then, a chase begins. As a couple (the male is the driver) approach or dive into the plants, they will pause for a moment or two, assume a close-pressed position (side-by-side), sometimes turning over in their frenzy, and then speed on to repeat the procedure again and again until the female is spawned out. During these pauses, the female scatters her eggs and the excited male fertilizes them.

After spawning is over (a spawned-out female looks flatter in the sides and worse for wear) put the fish back in their original quarters. Within the space of 36 hours the fry will break free of the eggs. For the next day or so, the free fry stay hanging on the plants and objects nearby. On about the third day of hatching, the fry will be swimming about the tank. Before they are free swimming, it is a good plan to introduce clean infusorians and freshly hatched brine shrimps into the water. Also have plenty of minute live food and powder fine prepared food ready, and introduce this in small amounts twice or thrice daily. The fry of *H. herbertaxelrodi* make rapid progress if the water is kept wholesome by correct feeding and the temperature is kept right and not allowed to fluctuate (at least too rapidly).

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It is commonly known that Surgeon fishes are so called because of the sharp spines they have on each side of the base of their tails. All Surgeon fish and Tangs belong to the family Anthuridae, derived from the Greek meaning 'spiny tail'. This spine can be erected at right angles to the body when the fish is angry or adopting a defensive position. When the fish lashes its tail it can inflict quite considerable damage on any adversary which dares venture too near. Surgeon fish and Tangs are worldwide in distribution in tropical seas but are best represented in the Indo Pacific. Relatively few species occur in the tropical Atlantic and none at all in the Mediterranean.

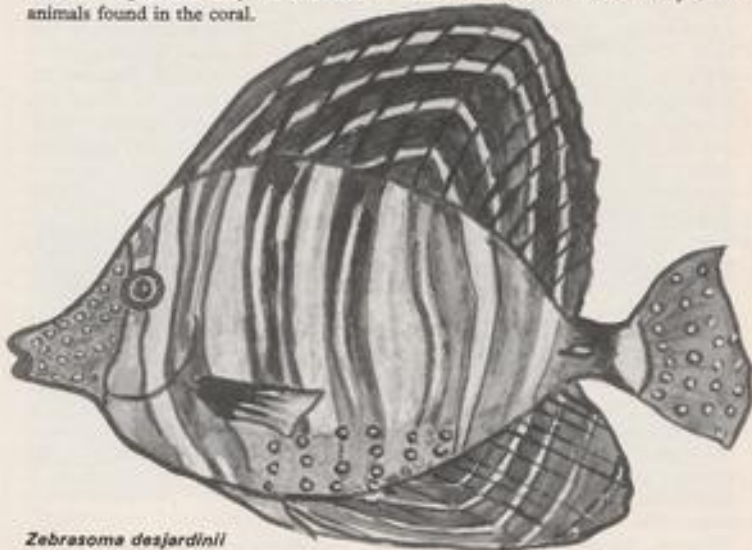
Marine fishkeepers usually keep at least one fish from this family in their collection because so many of the fish possess such beautiful colours. Some of the most striking fish come from the small but popular *Zebrasoma* genus which contains just six known species. Characteristic of fishes in this genus are high dorsal and anal fins, especially in the young fish. The snout of these fishes also projects noticeably and their bodies are rounder than other Surgeon fishes. *Zebrasoma* species also have only four or five dorsal spines as opposed to the eight or nine found in *Acanthurus* species. Species included in this genus are *Zebrasoma flavescens* (Yellow Tang), *Z. scopas* (Mink Tang), *Z. veliferum* and *Z. desjardini* (Sailfin Tangs), *Z. xanthurus* (Emperor Tang or Yellow Tail Tang), and *Z. gonuatum*. All of these fish can be distinguished on the basis of colour pattern alone although some confusion often occurs between the two species commonly sold as Sailfin Tangs. It has been suggested that there are not two distinct species but just two colour variations of *Z. veliferum*. However, the most obvious difference in these fishes is in the tail fin and body markings. In *Z. veliferum* the tail is plain yellow with white edges. In *Z. desjardini* the tail is a greyish colour with light spots and the lower portion of the fish's body has the vertical yellow lines broken up into yellow spots. *Z. veliferum* does not have these spots.

TANGS OF THE ZEBRASOMA GENUS

by P. M. Millson

Sailfin Tangs come from the Indian Ocean and the coral atolls of the Western Pacific. They can grow up to 30 cm in the wild and they are powerful swimmers needing plenty of space in the aquarium. Like other Surgeon fish and Tangs they have razor sharp teeth which they use for scraping off pieces of coral and they feed on algae and tiny invertebrate animals found in the coral.

The Yellow Tang is found near the Hawaiian Islands and can grow to about 20 cm in the wild. This fish does not require so much swimming space as other fish in the genus. Several of the fish can be kept in a tank at the same time although problems often arise when numbers are limited to two. Yellow Tangs also seem to dislike other fishes which are yellow.



Zebrasoma desjardini



Zebrasoma veliferum

I had one Yellow Tang which took an instant dislike to a Regal Tang and pursued him relentlessly around the aquarium, though whether that was because of the Regal Tang's yellow tail or because of a straight forward clash of personalities I was never quite sure. Fish of this species are frequently seen available for sale in an excessively lean or emaciated condition. Generally speaking it is unwise to purchase fish looking like this although if the fish is lively and obviously taking an interest in its food it is quite possible it will soon regain some of its bodyweight. Yellow Tangs are also prone to catching little black flukes. These flukes do not appear to affect other fishes and I have observed that a Yellow Tang placed under stress is quite likely to become afflicted with these. Stress may be caused by a sudden change in water conditions or even the introduction of a new fish into the tank and the flukes may be seen initially as just one or two tiny black dots on the body of the fish. They must be treated in this early stage or they will rapidly spread over the entire body of the fish and eventually cause its demise. I have found the most effective treatment for these flukes to be Sterazin. A few treatments will usually clear them up but they are quite likely to reappear at a later date if the fish once again becomes stressed so a close observation of the fish is essential at all times. In spite of these drawbacks

the Yellow Tang is a delightful little fish and specimens can become very tame.

The Mink Tang is less colourful than the Yellow Tang but it is nevertheless a very attractive, hardy fish. It is a widely distributed tropical Indian Ocean and West Pacific species found from East Africa to the East Indies and to the Philippines, Solomon Islands and Marshal Islands. It is found in or close to deep water, but in some places appears in shoal water near to the reefs. Its main colour is brown marked with pale spots but some specimens are a yellow green colour and very young fish are often yellow. Because of its lack of bright colours this fish is less expensive to buy than many of the other Tangs. For this reason, and because it is a hardy fish, resistant to most diseases, the Mink Tang is often recommended as an excellent beginner's fish. However, it should be remembered that, like the Sailfin Tang, the Mink Tang does like plenty of swimming space.

Z. xanthurum is, perhaps, the largest member of the genus. It has been recorded from a rather restricted area of the Indian Ocean, the Gulf of Aden and the Red Sea. Its body colour in the Sri Lankan region is often wholly black. In the Red Sea area it has been seen as blue. But in spite of these colour variations the tail fin of all the fishes from this species is a bright yellow, as its scientific name implies. These fish are not often



Zebrasoma xanthurum

seen for sale in this country and do not appear to be so commonly imported as the species already mentioned. They are large, active fish. They make good community fish but again need to be kept in large tanks.

Z. gemmatum is even more rarely seen than *Z. xanthurum* and has been reported from just a few islands in the West Indian Ocean. It is a brown colour covered in white spots.

To be kept successfully in the aquarium it must be remembered that all fishes in this genus are primarily herbivorous in the wild. Like all herbivorous animals they need to be continually feeding, unlike the carnivores who can gorge themselves and then fast for a few days. It is essential, then, that the fish receive frequent feedings of vegetable food. It is not sufficient to rely on an abundant supply of algae in the tank although quite obviously this is beneficial to the fish. The fish should also be provided with chopped lettuce or spinach. In addition more meatier foods such as shrimp, squid and even flake will be taken quite readily. Without vegetable food, however, the fish will soon lose weight, suffer from fin rot and other ailments and eventually die. The Gamma range of foods offer a special Tang diet but my Tangs never really seem to have taken to this.

All the fish mentioned make good community fish and usually their surgeon's scalpels are only used when the fish feel threatened. However, their long, large fins frequently seem to get ripped and torn. Puffers, especially, seem to like to have a nibble if they can get close enough. Damselfish and Triggers can also be a problem. Kept with these fish Tangs may not get enough food to satisfy their nutritional requirements. Naturally greedy and aggressive fish will always get the lion's share of any meal and when food is floating on the surface of the water Tangs often have difficulty in reaching it because of their high dorsal fin. However, given the correct tank mates, water conditions and diet Tangs of this genus do very well in captivity and have proved to be quite long lived.

EVER GET the feeling that you aren't really an aquarist any more? As you check the setting on your micro-chip thermostat; read off the temperature on your liquid crystal digital thermometer; check the pump and change the medium in the filter before adjusting the pH, do you ever wonder if its all really necessary?

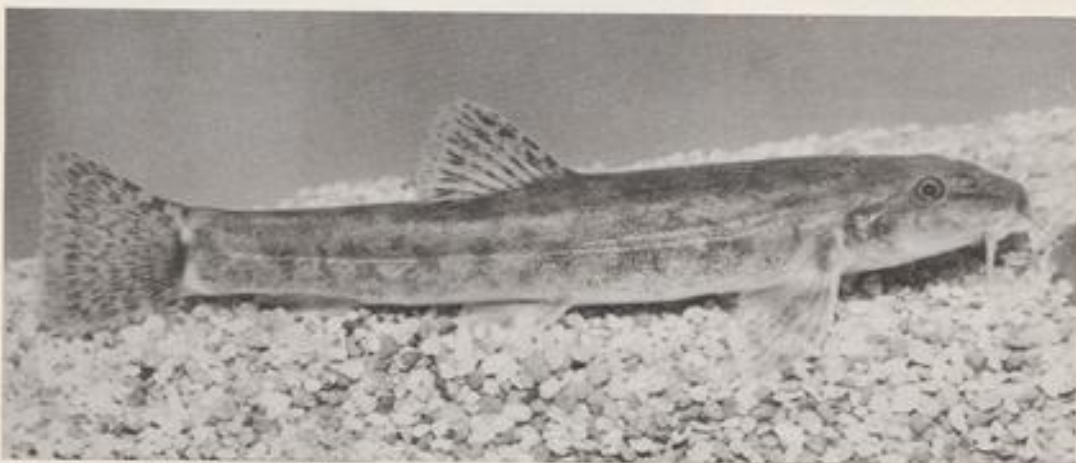
With the advent of so-called high technology into the aquarium are we losing sight of our hobby and becoming a collection of maintenance engineers?

the term 'balanced aquarium' to a modern day aquarist and he will probably think you are referring to a new type of tank stand. Biology has been pushed into the background and technology has taken over, but have our fishes benefited?

How many times have you heard the cry from older aquarists that so-and-so isn't as big as it was when he first started keeping fish? Or such-and-such isn't as colourful as it was? You only have to go along to a show

Aquarist or Maintenance Engineer?

by Barry Durham



A Stone Loach (*Noemacheilus barbatus*), pond bred from wild stock, was acclimatised to a 'tropical' community

The situation has come home to me over the last year or two as more and more gadgets have come on to the market. The biggest explosion seems to be in filtration where we are warned that without this or that super new efficient mechanical biological extra-terrestrial filter our fish are going to expire as soon as we put them in the tank. Let's face it, the only people who really need filters are lazy aquarists who overstock their tanks.

There used to be this concept called the 'balanced aquarium' which referred to the idea of equating the number of fish to the volume of water in the tank and the number of plants. What you aimed for was plants using up the fishes' detritus and producing oxygen while using up the carbon dioxide exhaled by the fish. Mention



Platies were unconcerned by the fluctuating temperatures

and you can't fail to catch comments like that. Now most of us like to blame it on the exporters. 'It's something they put in the water out in Singapore,' someone once told me, very confidentially of course.

What a load of old rubbish! The real reasons are that we are now spending so much time looking after our gadgets that we don't have the time to breed decent fish any more, and those gadgets are probably making the water so sterile that the fish hasn't got a snowball in hell's chance of living in conditions that even remotely approach its natural habitat.

Artificial conditions

All right, I admit that we are dealing with artificial conditions in any event and volumes of water that are miniscule compared to many areas that tropical fish come from, so some means of keeping the pollution down is necessary. The simple answer to that one harks back to the 'balanced aquarium' concept again—fewer fish and more plants.

It is a little over twenty years since I first started keeping fish and one of the main things I remember is having to take fish back to the shop because they had outgrown my 18 in. x 10 in. x 10 in. community tank. There were no pumps, no filters, not even an airstone. Just ten or twelve fish and about 50 to 60 plants arranged round the back and sides. I used to clean the glass once a week and siphon up the muck every Saturday morning, topping up the tank with clean water from the tap.

When I went up to a 24 in. tank, set up in exactly the same way, a couple of my fish even won prizes the first time I took them out to a show. I still have a certificate from the old Association of Manchester and District Aquarist Societies awarding a second place to my three-spot gourami with 77 points and a third to my neon tetra with 79. Scores like that would quite easily have won best in show awards in recent years!

Let's face it, unless a fish comes from a fast flowing mountain stream the water in its natural habitat is bound to be polluted to a greater or lesser degree. Some fish even thrive near settlements where domestic



White Cloud Mountain Minnows bred quite happily under the conditions

animals use the water which is also the communal dustbin. Fish like *Asocia splendens* do best in dirty tanks! I've seen it and proved it for myself. But this does not mean that you should neglect all your 'housework'. In fact it will probably mean you taking a little extra care and a little extra time in looking after your FISH as opposed to your gadgets.

A little over a year ago I started an experiment to prove to myself that I could still use the balanced aquarium concept and make it work. But I also went further. In an effort to prove another of my pet theories I left the heater and thermostat out of the tank as well.

My reasoning behind this was simple and twofold. Most people who have been to tropical countries will tell you that while it is hot during the day the air temperature drops considerably at night. This is mainly because there are no clouds to keep the heat in. Now, while water does take a longer time to cool down than the surrounding earth and rocks, it must give up some of its heat to the surroundings which are cooling much faster. So the water temperature drops several degrees at night. Having a heater and thermostat in our tanks means that the water is kept at more or less the same temperature all the time which is therefore totally unnatural to the fish.

Insulated Homes

The past twenty years or so has

also seen considerable changes in our own homes. They are better insulated and a high percentage of people have central heating. House and room temperatures are therefore maintained at something like 70-75°F during the day and even if the heating is switched off at night the temperature is not likely to fall more than about 10 degrees. Such a situation I would think that is more comparable to tropical climates than maintaining the water at a constant 75°F.

Now before anybody jumps on me to point out that not everyone can afford central heating, let me say that I don't enjoy that luxury. Nor do I have double glazing or cavity wall insulation (and if there are any salesmen reading this, I don't particularly want them either!). My loft is insulated which stops a lot of rising heat from escaping and the main source of heating for the whole house is a gas fire in the living room.

There was, therefore, more likelihood of a greater temperature drop than average in my tanks if I left heaters out. The tank involved was my 48 in. x 12 in. x 18 in. display tank illuminated only by a 30 watt warm white fluorescent tube and three 25 watt pearl bulbs. The lighting combination was not the best for growing plants but it was a good compromise. The best set up for plants in a tank of that size is five 25 watt pearl bulbs. The plants "come on a bomb" under those conditions (probably because of the



Bitterling thrived and showed off their best colours

large amount of red and yellow in the light) but the bulbs do give out quite a bit of heat which tends to sit near the surface unless you have very active fish.

Fish Mixture

So, there we were all set up. Fish included a real mixture of livebearers, anabantids, barbs, corydoras catfish as well as more temperate species like white cloud mountain minnows, medakas and even bitterling, goldfish and native stone loaches. This gave me the chance to see which type of fish would thrive best under what I was hoping were conditions more like those in the wild than is usual.

What happened? Nothing. The fish grew. The plants grew. The fish even ate some of the plants. The temperature reached about 74°F during the day and each morning was down to around 64°F. I think the lowest it ever reached was 58°F one night when we had a particularly sharp frost and I accidentally left a window open. But there were no casualties and no ill effects. In fact I think the fish are hardier and more robust than most I have kept and there have been no outbreaks of any disease. Tank maintenance involved cleaning the glass once a week and siphoning off any mulm that hasn't found its way into

the gravel every two or three weeks or so. The tank was then topped up with cold water from the tap. Feeding was done mainly with flake foods with the occasional live treat and up to now the medakas have spawned several times; the white clouds appear to be always at it; the livebearers have produced dozens of fry; the anabantids have bubble-nested frequently and even the corydoras have laid their eggs.

I must also confess that for part

of the time—about two months—the tank was filtered because I was asked to test some new sponge filters. While the filters worked well I can't honestly say that they proved an advantage to either the fish or the plants. They did save on mulm removal time, however.

So what now? A campaign to throw out all our heaters, thermostats, and filters? No, I don't think so. I have a heater and 'stat ready in case we have a particularly hard winter and I have pumps and filters ready in case I feel they are necessary in breeding tanks, for instance. Marine fishkeepers will always require their equipment to maintain conditions as close to those found in the ocean as possible, and there will always be the aquarist who likes gadgets; who doesn't feel safe without his double protected computerised time switch for the tank lights and automatic feeder.

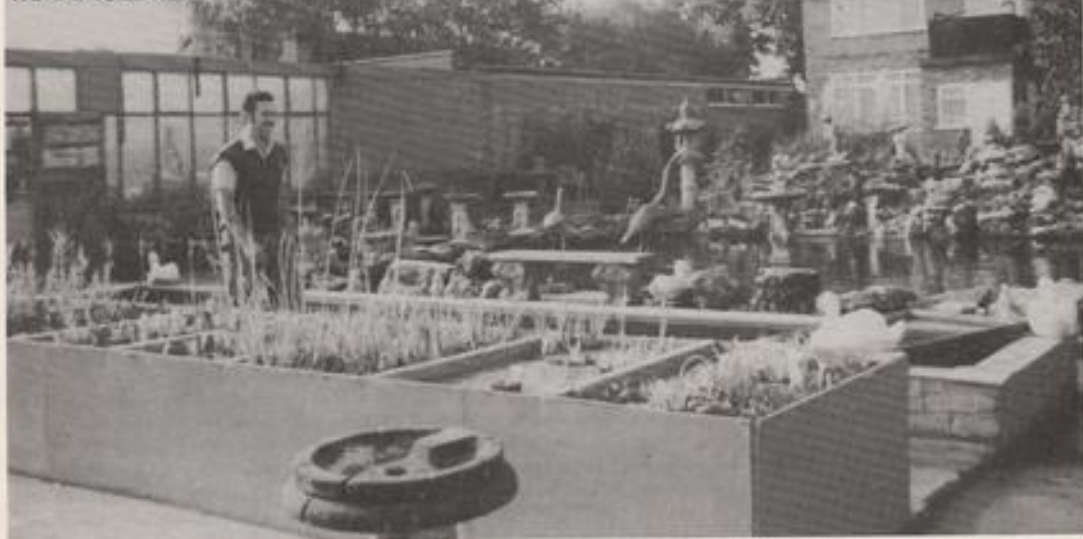
There will no doubt be those of you who will scoff and say that I am old fashioned and technology can do nothing but good for the hobby. I don't disagree, I have simply reached the conclusion that I would rather be a naturalist. Anyone care to try to convince me otherwise?



Opaline Gouramies with Black Mollies—hardier than you think

Shirley Aquatics

UNDER NEW
MANAGEMENT



by
Frank Orme

UNTIL recent years I was a fairly frequent visitor to Shirley Aquatics Limited. This well-known business, which covers an area of approximately 2 acres, is situated upon the main Birmingham to Stratford-upon-Avon road (A34), roughly 8 miles from Birmingham and within one-mile of the M42. Over the years I became well acquainted with the proprietor, the late Colin Roe, and saw him expand his interest in growing aquatic plants into all fields of the hobby; coldwater, tropical and marine enthusiasts were all catered for.

It was with some interest, therefore, that I accepted an invitation from Mr. John Cook to inspect the new showroom which had been created. Shirley Aquatics was acquired by the wholesale company of R. J. Cook Limited and re-opened in February 1982. Various improvements were made; a large ornamental pool with an impressive

rockery background was stocked with colourful, good quality specimens of koi, as part of the outside display. A number of spacious rectangular stock pools held smaller koi and various other species of coldwater fish and, without exception, all appeared to be in first class condition, well coloured, and swimming actively—a fact upon which I remarked to Mr. Cook to which he replied that only when stock had passed through a period of quarantine and, so far as could be reasonably ascertained, they were satisfied with the health of the fish would it be placed on display and offered for sale. Certainly, if it had been the purpose of my visit, I would have had little hesitation in spending my money on any of the fish which I saw.

The showroom, when I last saw it, had been rather on the small side with a dark tunnel-way leading off. The walls of the tunnel had inset tanks of various marine life, these had been well lit and provided the only light—which was effective but not impressive. Under the direction of Mr. Cook a transformation had taken place. At a

A small section of the outside display area

cost of £24,000 the showroom had been completely refurbished to provide 1,500 square feet of fully carpeted floor space. Gone were the original marine tanks and the ill-lit tunnel, replaced by a viewing area that was brightly illuminated by fluorescent tube ceiling fittings and spotlights. On either side the walls were composed of full height, attractively designed, mahogany units containing fully furnished display tanks. There were over one hundred of these aquariums ranging from 50 gallons up to 500 gallons capacity, in which could be seen tropical freshwater fish, tropical marine fish and invertebrates and some truly magnificent tropical freshwater plants. Beneath the 'U' shaped, mahogany topped, counter was a large well-furnished aquarium and this was strategically placed opposite the entrance.

The remainder of the showroom was devoted to floor-standing aquarium

cabinets and bookcases. These were constructed in mahogany, solidly made and most attractively designed. They were pieces of furniture that would grace any home and which even the most discerning would have difficulty in faulting for appearance. Although there was a good variety of design and size, I understand that special sizes and/or designs can be made to order to meet a customer's specific requirements. The extensive glass-fronted display cabinet seemed to contain just about everything that the hobbyist might require from flake foods up to high-capacity pumps and filters. I was informed that it is the aim of Shirley Aquatics to be able to supply every possible requirement of the aquarist—whether beginner or 'old-hand' in any of the branches of amateur fishkeeping.



Reception area

Furnished aquarium display of marine and freshwater tropical fishes



During my tour of the premises my attention was drawn to the large variety of tropical plants—52 in all—that were on display. These were the Danish grown tropical plants which are imported by the parent company, and distributed in all areas from the Midlands to the south inclusive. These plants were noticeably clean and free of any foreign matter, growing sturdily in small plastic pots containing stone-wool. That they carried strong root systems was quite obvious to see from the number of rootlets protruding from each pot. Why container grown plants for aquarists have taken so long to appear is strange; after all the gardener has been able to purchase container grown terrestrial plants for some years. Given the correct treatment and growing conditions these plants should suffer little, if any, set-back from being transplanted into the aquarium. This, I consider, is an ideal way to obtain healthy growing plants—I wonder how long it will be before a British nursery offers home-grown aquatic plants rooted in containers?

I particularly noted that there was no pressure on visitors to spend their money, in fact the potential customers

had to make the approach, otherwise they were allowed to look around unhindered. Queries, and I overheard one or two people seeking answers to their problems, were listened to and answered with politeness and patience—too often one is met by a couldn't-care-less attitude, which seeks only to make a sale.

It seems to have become a tradition for Shirley Aquatics to advertise on the outside back page of the *Aquarist & Pondkeeper*, but always to be one of the leading dealers in aquarist's requirements. With the improvements which have been made, and are proposed, I have little doubt that Shirley Aquatics will, under its new management,

expand its reputation still further amongst fishkeepers and attract an ever widening clientele.

I certainly enjoyed my visit, and can recommend Shirley Aquatics to others, and shall look forward to calling again during 1983 to see the proposed large glasshouse where visitors will be able to view various coldwater fish under ideal conditions. R. J. Cook Limited are to be congratulated upon the improvements which they have so far made to the premises of this, their new retail outlet.

Display of mahogany aquarium cabinets, and sundry goods



THE CONSTRUCTION OF AN ECONOMIC FISH HOUSE

By Dr. Peter A. Lewis, PhD
Part 1

OVER the last 15 years I have moved several times in the course of my employment and each move has necessitated the complete upheaval and relocation of my tropical fish collection which at one time comprised 40 tanks and around 3,500 adult and young fish. In the majority of instances each of these moves has gone without a hitch thanks to the miracle of polythene bags and polystyrene insulated packing boxes. Each move, however, brought the same priority—where was I to house my collection and equipment. Inevitably temporary quarters were found in a spare bedroom whilst the construction of more permanent quarters was planned because believe me when I say a spare bedroom is not the place for a fish collection. It is as a result of my experience that this series of articles has been put together with the intention of fully discussing the establishment of a "fish house" be it in a cellar, an out-house, a garden shed or a modified garage.

During this series my intention is to cover the planning, construction, and management of a fish house from the viewpoint of the hobbyist be he a keeper of freshwater or marine tropical or coldwater fish. My intention is not to cover the "professional" aspects likely to be adopted by the commercial breeder who is doing the work as his livelihood. My views have always been that hobbyists living in England cannot possibly compete with professional breeders and exporters living in such places as Singapore and Florida just from the mere economic

standpoint of English aquarists being faced with the high costs of having to provide heat for their tropical charges. Anyone who still doubts their ability to compete with breeders or exporters from tropical climates can readily satisfy his curiosity by discussing import prices with his local aquatic retailer, that is providing his relationship extends to sharing these types of confidentialities. The hobbyist will, however, always find an outlet through the trade for healthy, tank reared fish and can expect this sale of "excess breeding stock" to supplement the cost of the hobby. In instances the hobbyist can actually make a respectable profit by breeding high priced fish such as new Malawi or Tanganyikan species or the ever popular Discus which always command a high price. However, it must never be forgotten that although the rewards of success may be great the price of failure can be very expensive since inevitably fish which fetch a high price also cost a high price particularly if breeding pairs are purchased. Nevertheless, good stock will never cease to command a good price and a fish house will help the hobbyist raise good stock of an acceptable quality in quantities necessary to convince the local retailers of one's commitment to supplying them if this is your goal.

Before beginning the detailed account of what is necessary for constructing each type of fish house we must first give considerable thought to the who, what, when, where, how, and why of the project. Who will build it, what

will it be built from, where shall it be built, how much will it cost and why is the project necessary—what will it accomplish?

In order to help answer all the above queries it is best to methodically compile a checklist and spend as much time as necessary answering each point that arises from that list such that you go into the project as fully aware of the pitfalls and likely problems as practically possible. I feel that this initial chapter in the fish house series is the place to address this check-off list.

Planning the location

Likely locations are: free standing in the garden, adjacent to the house using one wall of the house as the fourth wall of the fish house, in a cellar, in an existing outbuilding such as a wash house, stable, potting shed or garage or inside the house using a spare room. Remember, however, glass will always be fragile and water will always be wet and heavy. Therefore, wherever you plan to keep your fish you must be prepared to accept the consequences of the unplanned discharge of 50 gallons (500 pounds) of water onto the floor. If for this reason alone the use of an upstairs room must be very low on the location choice list. If planning to use the cellar due consideration must be paid to ways available to remove water when tanks are being cleaned out since in the majority of cases the fish house is likely to be below ground level. A big plus with the cellar location is that often a source of water for the tanks is rarely a problem since the plumbing generally runs through this part of the house.

Materials of construction

Is the structure to be made from brick, concrete, block, breeze block, cinder block, or wood on a wooden frame? If building in an existing shed or room remember to consider the use of hardboard or fibreboard cladding for the walls. Remember also to take into account the floor and ceiling. Ceiling may be boarded or tiled with acoustic or polyurethane tiles. Floors may be concrete or wooden or even well packed with gravel with the option

to add tile or suitable carpeting over the concrete or wooden floors. Whenever making plans for the floor do not forget to include some allowance for draining unwanted water from or through the floor.

Insulation

Throughout this series of articles mention will be made many times as to the absolute necessity of having adequate, efficient insulation. Fuel prices are a heavy burden on the budget of any home and they are a burden that is not likely to do anything other than escalate. The initial cost of insulation will be offset many times over the life of a well made fish house and will add to the comfort and enjoyment of the project. Adequate insulation will also reduce the risk of surface condensation within the fish house, a point of significance when one considers the humidity likely to build up within. Since insulation is of such overbearing importance in the construction of any structure designed to keep tropical fish at an economical level, I feel that space must be devoted at this stage to a brief digression and discussion of the different types of insulation and the meaning of terms involved.

About one third of the heat in your fish house will be lost through walls, ceiling, and floors if insulation is poor or non-existent. To understand the language of insulation we must first understand the meaning of the term "conductor." Some materials resist the flow of heat better than others. A glass filled with hot drink feels hotter than a styrofoam cup filled with the same hot drink. This phenomenon of different materials passing heat through themselves to distribute the heat away from the points of contact is called "conduction" and those materials that do a good job of conducting heat away from the source we call "conductors" and those which do a poor job are termed "insulators." It is these latter materials which are required for our fish house project.

Most insulators are used in construction work because they trap many thousands of pockets of "static air spaces" within the material. Heat

moves through these materials only slowly because the trapped air spaces or closed gas cells as in the case of a foamed insulator are so small that the heat cannot easily move from the warm side to the cold side by convection.

Insulators are rated using the term "resistance" and their relative efficiency can be measured by comparison of their resistance or "R-value." The higher the R-value the better insulator the material will be. The resistance for materials put in contact with each other is additive, eg, a rigid 1 in. polystyrene board with an R-value of 3.45 placed over 2 in. of fibreglass with an R-value of 6.7 gives a total R-value of 3.45 + 6.7 = 11.15.

Today many types of insulation are commercially available for the D-I-Y enthusiast through home improvement or lumber stores. Choose which type suits your needs best and then shop around for the best price. Of the types available fibreglass is probably the most common and generally comes in rolls of varying thicknesses. Fibreglass has an R-value of 3.33 per inch of thickness thus a 3 inch thickness has an R-value of 10. Fibreglass is fire and vermin proof, moderate in cost and easy to install. Its only disadvantage is that over a period of a few years the material may mat down or settle on itself resulting in the loss of part of its insulation value. This is particularly true if the fibreglass is used without a vapour barrier.

Rock wool, also readily available, is much like fibreglass except it is made from melted rock rather than glass. Rock wool has an equivalent R-value to fibreglass but its tendency to matting is even worse.

The most common type of plastic insulation is polystyrene which is supplied as a "closed cell" foam board or as a "granule board" where the granules have been heat and pressure treated so they stick together. The R-value for these materials is about 5.5 per inch for the closed cell and 4 for the granule type. Foamed in place polyurethane has a very high R-value at 6.5 per inch but is very expensive to install and those based on formaldehyde have been the subject of recent worries on toxicity. Polystyrene is

moisture and vermin resistant, easy to install but can be an EXTREME fire hazard unless special grades are purchased and ideally should never be installed where it is exposed. A two inch thick layer of polystyrene board is an excellent floor insulator when placed below a concrete poured floor in addition to being an ideal moisture barrier.

Vermiculite (R = 2.1 per inch) and Perlite (R = 2.7 per inch) are loose fill insulators which may be poured into a hollow space. They are difficult to use for insulation in a vertical position between wall studs but are especially suitable for filling the spaces between hollow core concrete blocks.

For the purpose of calculating the resistance of a finished wall the following additional values are required:

- Resistance of a thin film of air on the outside wall = 0.2
- Resistance of typical $\frac{1}{2}$ in. plywood = 0.8
- Resistance of a 2 in. cavity space = 2.0
- Resistance of a typical house brick = 2.0
- Resistance of $\frac{1}{2}$ in. plaster board = 0.5
- Resistance of a thin film of air on inside wall = 0.7

For really efficient heat conservation a total R-value of 19 for the ceiling/roof and 11 for the walls is recommended. This equates to 6 inches of fibreglass in the roof void and 3 inches in the wall space.

Remember two vital points when adding insulation. There must be no draughts circulating through the layers of insulation since this greatly increases conduction through the layers and reduces efficiency. A $3\frac{1}{2}$ in. thick layer of fibreglass forcibly sandwiched between a 2 in. wall batten does not give $3\frac{1}{2}$ in. of insulation, it only gives 2 inches.

As the articles expand the installation of insulation at each stage will be fully covered together with an estimate of the R-value achieved against that recommended.

Next month I will continue with our basic checklist and cover such items as ventilation, drainage, storage, heating and shelving.

NEWS...



SOUTH EAST



THE format of the S.P.A.S.S. meeting on 19th October differed from the usual one speaker by having four individual members lecturing on their own favourite live foods and answering questions from a large audience. Dave Brooks explained the advantages of micro-oids and fruit flies. While Fred Pearl possessed the care for earthworms, Tony Jacques the benefit of micro worms, grindal and white worms and Roy Trim extolled the virtues of Daphnia. Samples of many of the foods circulated around the room during the evening with five starter cultures donated by some of the speakers. Even in this age of fake, freeze dried and frozen food it was interesting to see how many aquarists still use natural foods. On display were some of this year's Globe-eyes project fish and a table show of members' breeder teams. Dave 'Mac' Mackay judged the youngsters giving the following results: 1, Eric Franklin (Tench); 2, Mary Franklin (White Cloud Mountain Minnow—Coldwater brood and raised); 3, Eric Franklin (Comet); 4, Tony Jacques (Pearl-scales).

The annual S.P.A.S.S. Isle of Wight Inter-Club contest for Goldwater fish was held on 7th November, at Drake House, Wimbeldon. As always the competition was keen with S.P.A.S.S. beating I.S.W. after last year's draw. Judges were Bill Leach—Twinnal Goldfish/Native and Pomato, and Derek Seymour—Sceptical Goldfish/Overspill Goldfish. The class winners were a lionhead, a Britol shubunkin and a Prussian Carp.

One date in the Calendar that both members and friends of S.P.A.S.S. always look forward to is the annual Biting and Buy evening. On 16th November plenty of bargain hunters had a chance to buy a variety of lots which ranged from fish to chinaware and toys to pond filters and accessories. Gerry Haring was kept busy with the lively bidding. South Park Aquatic (Study) Society specialise in coldwater fishkeeping and meets at 8.00 p.m. on the third Tuesday of every month at the Wimbeldon Community Centre, St. George's Road, London SW19. New members and visitors always welcome. Full details from: Mrs. Marguerite Dudley, 143 South Park Road, Wimbeldon, London SW19 8RX. (Tel: 01-540 5662).

RESULTS of the Kingston and District A.S. open show. The best fish in show was won by Mr. J. Pollard (class 27) and the highest pointed visiting society was S.P.A.S.S. Class winners: 1, T. and D. Cruickshank (Kendon) (Shubunkin); 2, Mr. and Mrs. Brook (Croydon) (B. Filamentosa); 3, R. Hart (Hounslow) (N. Trifasciata); 4, M. West (Kingston) (L. Agassiz); 5, A. Fuller (Kingston) (R. Anomala); 6, B. Farmer (H. Kingsley); 7, Mr. and Mrs. Brent (Croydon) (Auro Ocellatus); 8, P. Moye (Houghton Regis) (Cl. Kingsley); 9, P. Furse (Hounslow) (Gold Gourami); 10, Judith Owen (B. Fawcett); 11, L. Eldridge (B.K.A.) (N. Warfalus); 12, P. Moye (Houghton Regis) (R. Pycnopora); 13, T. Cruickshank (Hendon) (R. Elagari); 14, Mr. and Mrs. Brook (Croydon) (B. Splen-

From Aquarists' Societies

dene). 15, D. Cruickshank (Hendon) (S. Solon); 16, T. Cruickshank (Hendon) (P. Blochi); 17, D. Cruickshank (Hendon) (Khol); 18, A. Fuller (Kingston) (M. Panoaius); 19, G. Owen (R. Pycnopora); 20, M. Strange (Basingstoke) (B. Khabdopuz); 21, A. Fuller (Cherry Barbe); 22, D. Howe (Kingston) (Red Wag Platies); 23, C. Chisholt (Croydon) (Platy Variatus); 24, M. Strange (Basingstoke) (P. Zonata); 25, S. Norris (Bracknell) (Common Goldfish); 26, J. Pollard (Kingston) (London Shubunkin); 27, J. Pollard (Fawcett); 28, J. Pollard (Putney); 29, T. Jacques (SPASS) (Pearl-scale); 30, Mr. and Mrs. Brook (Croydon) (Phoxinus Phoxinus); 31, R. Hart (N. Lutrensis); 32, E. Franklin (SPASS) (Cyanellus Sordidus); 33, E. Franklin (Oligo Koi); 34, D. Heenan (SPASS) (Shouwa Sanke Koi); 35, Mrs. Bartheop (SPASS) (Hornwort); 36, Carol Greenham (SPASS) (Willow Moss); 37, D. Ellis (Kingston) (Water Soldier); 38, T. Cruickshank (Snapping Turtle).

THE monthly meeting of the Mid-Sussex A.S. held on 11th November, was an inter-club with clubs from surrounding areas: Tonbridge, Dorendale, Brighton, Brighton, Portsmouth, South Downs, Hastings, and of course M.S.A.S. The talk was given by Mr. D. Cherrington, and was about livebearers. The judges were Mr. Jack Solwell and Mr. Norman Davis. There were 109 fish on show. Winners: Class J: 1 and 4, Charles Raggio; 2 and 3, Andy Peart. Class N-W: 1, M. Bird; 2, Ken Dunn; 3, Andy Peart; 4, J. Smith. Class N-W: 1 and 2, E. Smith; 3 and 4, P. Whidett. Class D: 1, Ray Cooke; 2, E. Smith; 3, M. Bird; 4, D. Force. Class H: 1, Ray Cooke; 2, Andy Peart; 3, P. Levine; 4, Ben Sayers. Class E: 1, Charles Raggio; 2, Andy Peart; 3, D. Force; 4, C. Hill. The points for the clubs are: Tonbridge, 14; Dorendale, 3; Brighton, 20; Reigate, 0; Portsmouth, 3; South Downs, 3; Hastings, 14; M.S.A.S., 3.

Basingstoke and District A.S. held their a.g.m. on 12 November. The new officers elected were: President, A. Blake; Chairman, B. Chaplin, 113 Abbey Road, Basingstoke; Vice-Chairman, J. Lovgrove; Secretary, M. D. Chapman, 140 Common Road, Basingstoke; Treasurer, T. Ralph; Programme Secretary, S. Dennis; Show Manager, C. Ralph; Show Secretary, M. Strange; Raffle Secretary, L. Chapman. The Society meets every second and fourth Friday in the month at the White Street Club at 8 p.m. New members most welcome.

East London Aquarist and Pondkeepers Association held their a.g.m. at the Cathedral Hall, Chadwell Heath, Essex. The following officers were elected: President, Mr. F. Vickers; Vice-President, Mrs. Arnold; Mr. R. Dodkins; Mr. B. Pegg; Chairman, Mr. K. Palmer; Vice-Chairman, Mr. R. Campion; General Secretary, Mrs. R. Ross; Treasurer, Mr. D. Mills; Show Secretary, Mr. M. Howels; Show Organiser/Equipment Officer, Mr. J. Ross; Librarian, Mr. G. Haygreen; Editor, Mr. G. Smith; Public Relations Officer, Mr. F. Simmons; Programme Secretary, Mr. K. Wrightson; Social Secretary, Mrs. H. Howels; Auditors, Mr. and Mrs. F. Vicker.

THE Wycombe March A.S. meet at 8.30 p.m. at the Young Adult Centre, Wycombe College, Queen Victoria Road, High Wycombe, Bucks, on the 1st and 3rd Thursdays of the month. Further details can be obtained from the Secretary, Jeff Woodbridge, 16 Mount Pleasant, Lane End, High Wycombe, Bucks. (Tel: High Wycombe 882875).

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.

QUESTIONS were flying in all directions at the Memorial Hall, Billings, Herne Bay, on 9th November, when Mr. Bob Spoor chaired a 'Two Way Question and Answer Time' at the monthly meeting of the East Kent Aquatic Study Group. Nearly 50 members attended and all agreed that a great deal of information and tips can be gained from these informal and enjoyable evenings. Questions and answers covered many aspects including the use of coloured lighting to promote plant growth, and the keeping of Tetras in tanks together with 'Lepid' fish. The November table show was judged by Mr. John Edwards and resulted: Class 'Y' (Mollies): 1 and 2, C. J. Bridgeman; 3, G. Neaves; 4, A. Neaves. Class 'T' (A.O.S. Livebearers): 1, 2 and 4, A. Aspell; 3, D. Jane. The judge congratulated all the members who had shown their fish, on the high standard and health of the 26 entries. For further information of Club activities ring Bob Spoor on Canterbury 52362.

Confederation of Aquarists. This new Association of Aquarists has received many enquiries from clubs and individuals, and are being dealt with as they come in. A meeting has been held with the F.N.A.S., E.A.S., N.E.F.A.S., Y.A.A.S., at the recent British Aquarist Festival and a new organization has been formulated, called the Confederation of Aquarists, which will now supersede the old C.U.K.A. and help to promote fellowship within the United Kingdom. Speakers are available to talk on the aims and ambitions of the association to any societies. Judges and lecturers are also available and more information can be obtained by writing to the Secretary, 7 Wheelers Court, Flogh Road, Barnesia, London S.W.11.

Remford and Becontree A.S. held their a.g.m. at St. Augustine's Church Hall, Birbeck Road, Rush Green, Remford, on the 7th October and the following Committee were elected: Chairman, J. Pitt; Secretary, M. Smith, 224 Wood Lane, Elm Park, Hornchurch, Essex RM12 5ND; Treasurer, E. Ward; Show Secretary, J. Adams; Asst. Show Secretary, P. Price; Programme Officer, G. Moore; Junior Member, N. Ryan; Lay Members, C. Wiseman and Mrs. D. Wiseman. The society meets on alternate Thursdays and new members or visitors are always welcome.

SOUTH WEST



DR. P. MILLER gave a most interesting talk on "Shore Line Fishes" to Helston A.S. Most of the fishes illustrated on the slides were from rock pools near the high water line. Almost all could be kept in a cool marine aquarium but the diet of some fly presented special problems. Table show results: Koi: 1, T. Harper; 2, D. Smart; 3 and 4, W. Perkins; Pond or River: 1 and 2, D. Stout; 3 and 4, T. Harper.

MIDLANDS AND WALES



AS from 4th January, the Cannock & District A.S. will be holding their meetings at the Edward Street Working Men's Club, 101 Edward Street, Bloomfield, Cannock, on the first and third Tuesday in every month, starting at 8.30 p.m. New members and visitors are always made most welcome, and further information concerning the society's activities can be obtained from Robert Potts, Secretary, 73 Oaks Drive, Cannock, Staffordshire WS11 1BU.

OBITUARY

It is with deep regret that we note the passing of Leonard Cooper, 78, who was one of the founder members of the Cannock & District A.S. fifteen years ago. Len was an avid fishkeeper, and has many friends over the country who will sadly miss him. Sincere condolences go out to his wife and family.

AT the a.g.m. of the British Cichlid Association on 28th November, in the New Imperial Hotel, Birmingham, the following officers were elected: Chairman, Ian C. Kollick; Secretary, Colin Comish, 106 Bebbington Road, Wirral, Merseyside L42 8PY; Treasurer and Membership Secretary, Dave Monk, 33 Kirkwood, Brenton, Peterborough, Cambs. (to whom all enquiries re membership should be directed); Technical Editor, Mary Bailey; Publications Editor, Paula Ramadan; Species Controller, Maurice Hall; Sales Officer, Wendy Monk.

EAST



THE Skegness & District A.S. committee for the coming year: Chairman, J. Chappell; Vice-Chairman, L. Turner; Treasurer, G. Seal; Show Secretary, H. Dewarster; A.S. Show Secretary, T. Froggatt.

SCOTLAND



Paisley & District A.S. held a meeting on 2nd November. Guest speaker was Mr. A. Frye who gave an very interesting talk on "Kittfish". The table show was Dwarfed and Large Cichlids. Results: Senior League: 1, Bill Dumbur (Blue Acara); 2, Evelyn Lindsay (Oscar); 3, G. Caldwell (Cichlasoma Spilargente); 4, Ian Lindsay (Kribia). Junior League: 1, Dylan Laffrey (Jewel Cichlid); 2, R. Brookling (Kribia); 3, Dylan Laffrey (Kribia); 4, Alan Patterson (Marble Angel). Meetings are held on the first Tuesday of every month at the Paisley Museum and Art Gallery, High Street, Paisley at 7.15 p.m. to 9.15 p.m. Everyone welcome; further information can be obtained from the Club Secretary: Mrs. B. Lindsay, 71 Wright Street, Renfrew, Renfrewshire PA4 8AS. (Tel: 041-889 5772).

NORTH



RESULTS of the Darwen A.S. annual open show: Guppies: 1, M. Crowther (Nelson); 2, K. and L. Duffy (Blackpool); 3, Mr. and Mrs. Stephenson (Oldham). Plecos: 1, M. Crowther; 2, Mr. and Mrs. Whittaker (Sandgrounders); 3, G. Barlow (Accrington). Swordtails: 1, R. Boardman (Atherton); 2, S. Whiting (N. Staffs); 3, Mr. and Mrs. Marshall (Merseyside). Molies: 1 and 3, M. Crowther; 2, D. Maloney (Merseyside). A.O.V. Livebearers: 1 and 2, J. and K. Corbett; 3, W. and D. Hoare (Independent). Small Anabantids: 1, M. Hartley (Sandgrounders); 2, D. Milner (Darwen); 3, C. Whitmore (Lydiam). Large Anabantids: 1, M. Hartley; 2, P. Graham (Nelson); 3, Mr. and Mrs. Marshall. Fighters: 1, A. and M. Redman; 2, C. A. Daniels; 3, A. M. Redman (all of Blackpool). Dwarf Cichlids: 1, R. I. Payne (Merseyside); 2, D. Maloney; 3, Mrs. A. Slater (Sandgrounders). Large Cichlids: 1, Mr. and Mrs. Bibby (Sandgrounders); 2, Mr. and Mrs. White (Bury); 3, Mr. and Mrs. Mulla (Merseyside). Anguis: 1, Mr. and Mrs. Slater; 2, Mr. and Mrs. Stephenson (Oldham); 3, Mr. and Mrs. Bibby. Rift Valley Cichlids: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mrs. Baldwin (Sandgrounders); 3, B. Wilson (St. Helens). Small Barbs: 1, Mr. and Mrs. Marshall; 2, Mr. and Mrs. B. Walsh (Darwen); 3, F. S. and A. Hopwood (Darwen). Large Barbs: 1, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Stephenson; 3, M. Crowther. Small Characins: 1, D. Milner; 2, Mr. and Mrs. B. Walsh; 3, Mr. and Mrs. Baldwin. Large Characins: 1, 2 and 3, Mr. and Mrs. B. Walsh. Toothcarps: 1, C. Brindle (Blackburn); 2, Mr. and Mrs. Baldwin; 3, C. Brindle (Blackburn). Danios: 1, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Bibby; 3, F. and S. Spence (Preston). Mintonas: 1, Mr. and Mrs. Baldwin; 2, R. I. Payne; 3, D. Milner. Rasbora: 1, Mr. and Mrs. Baldwin; 2, A. M. Redman; 3, Mr. and Mrs. Stephenson. Corydoras and Brochis: 1, Mr. and Mrs. Baldwin; 2 and 3, J. T. Morris (Sandgrounders). A.O.V. Catfish: 1, D. Parkinson (St. Helens); 2, J. T. Morris; 3, Mr. and Mrs. Baldwin. Loaches and Rotas: 1, Mr. and Mrs. M. Blackburn (Darwen); 2, Mr. and Mrs. Baldwin; 3, Mr. and Mrs. Stephenson. Sharks: 1 and 2, Mr. and Mrs. Baldwin; 3, W. and D. Hoare. Foxes: 1, Mr. and Mrs. Stephenson; 2, H. Yates (Darwen); 3, W. and D. Hoare. Breeders (Egglayers) A and B: 1 and 2, E. Jones (Atherton N.W.); 3, D. Gow (Darwen). Breeders (Egglayers) C and D: 1, J. T. Morris; 2, D. Milner; 3, D. R. Atkinson (Lakeland). Breeders (Livebearers): 1, R. Boardman (Atherton N.W.); 2, Mr. and Mrs. N. Lissman (Lakeland); 3, J. Winder (Lakeland). Pairs (Egglayers): 1, Mr. and Mrs. Walsh; 2 and 3, J. T. Morris. Pairs (Livebearers): 1 and 2, J. and K. Corbett (Merseyside); 3, D. Maloney (Merseyside). A.O.V. Tropical: 1 and 3, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Stephenson. Juniors (Livebearers): 1, A. M. Redman (Blackpool); 2, M. Crowther (Nelson); 3, P. Slater (Sandgrounders). Juniors (Egglayers): 1, D. Hartley (Sandgrounders); 2, M. Crowther (Nelson); 3, D. Hazlehurst (Sandgrounders). Common Goldfish and Comets: 1, S. Walsh (Accrington); 2, A. Turner (Accrington); 3, Mr. and Mrs. Stephenson. A.V. Shubunkins: 1, F. Foote (Accrington); 2, Mr. and Mrs. Stephenson; 3, S. Walsh. Fantails and Veil-tails: 1 and 2, J. Turner (Accrington); 3, C. Wallbank (Accrington). Lionheads and Orandas: 1, J. Turner; 2, S. Walsh; 3, P. Slater (Sandgrounders). Moors: 1, D. Milner. A.O.V. Goldwater: 1, S. Walsh; 2, P. Wade (Oldham); 3, D. Milner. Mini tanks: 1 and 2, F. S. and A. Hopwood; 3, D. Milner. Mini tanks (Novelty): 1, D. Milner; 2 and 3, F. S. and A. Hopwood.

AT the a.g.m. of the Newark & District A.S. on 2nd November the following officers were

elected: Chairman, Mr. D. Atkins; Show Secretary, Mr. P. Bryan; Secretary, Mr. A. J. Chamberlain; Treasurer, Mr. D. J. Butler; Committee, Mr. A. Bolding.

Blackburn Aquarist Waterlife Society are holding their open show early in the new year, and to help the organisers with the allocation of trophies, would any person holding, or knowing the whereabouts of any trophy please contact the Show Secretary, Mr. M. Whelan, 31 Fountain Avenue, Little Harwood, Blackburn, or the Secretary, Mrs. L. Vernon, 57 Selborne Street, Blackburn, as soon as possible.

Dates for the diary

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

JANUARY

18th January: NORTHERN COLDWATER FISH & PONDKEEPERS SOCIETY 1st open show to be held at St. Mark's Mission, Gloucester Terrace (off Ilwaco Road), Newcastle on Tyne. Benching from 12.00-2.00 p.m. Judging 2.15 prompt.

FEBRUARY

12th February: SOUTHERN LIVE-BEARERS AQUATIC GROUP, Yorkshire Area Group, meeting at Thorne Town Council Assembly Rooms, Thorne, near Doncaster, 3 p.m. Slide show and talk on "A Recent

Trip to Mexico" by Mr. J. Saeil D. Barrett and Mr. D. Thompson. New members welcome. Full details from Group Secretary, Tony Smith, 41 Hilderborough Road, Sodington, Yorks. YO15 3AZ.

15th February: SHEAF VALLEY A.S. 11th open show at the Dorman Twist Drill Company. For further information, contact Show Secretary, T. Matthews, 1 Acer Close, Kildmarsh, Sheffield S31 8HP (0742 480206) or D. Goddard (0742 746646).

MARCH

28th March: SKEGNESS & DISTRICT A.S. sixth open show at the Imperial Cafe, North Parade (opposite pier), Skegness. Bunching 12-2 p.m. Judging 2.15 p.m.

27th March: CENTRAL MIDLANDS CICHLIDS GROUP Second exhibition and auction at the Peace Memorial Hall, Postold Lane, Penkridge, Staffs. Items for auction may be handed in from 10 a.m. onwards. Auction commences at 1 p.m. Further details from Mrs. Maureen Hall, 71 Saxton Road, Penkridge, Staffs. Tel: Penkridge (078 571) 3944.

APRIL

2nd April: MALVERN & DISTRICT A.S. 10th open show at Christ Church Hall, St. Barnards Green, Malvern. 1st place trophies as well as perpetual trophies. En-

quiries to: Show Secretary, S. K. Yallop, 3 Monkhill, Yarkhill, Ludbury, Herefordshire. HR8 2TX. (Tel: Trampet 362).

16th April: TAUNTON & DISTRICT A.S. open show at the Taunton Youth and Community Centre, Tangier, Taunton. Schedules from Mr. R. Cooper, 14 Rochester Road, Taunton TA2 7LD.

24th April: YEovil A.S. open show, Parish Hall, Martock, Somerset. Schedules (S.A.S. please) from T. C. Perry, 316 St. Michael's Avenue, Yeovil, Somerset BA21 4NF.

24th April: BRITISH CICHLID ASSOCIATION auction, principally of cichlids, but also of books and other fish-related items, at the New Imperial Hotel, Temple Street, Birmingham (near New Street station), commencing at 12.00. Further details can be obtained from Ian Strick, 16 Kingsley Road, Bristol BS5 6AU, on receipt of a stamped addressed envelope.

MAY

1st May: CORBY & DISTRICT A.S. open show in the Festival Hall, Corby Civic Centre. Schedules from Alan Henderson, The Nook, Corby, Northants. Tel: Corby (05363) 68269.

8th May: BOURNEMOUTH A.S. annual open show at Kinross Community Centre, Pelham Park, Kinross, Bournemouth. Show schedules available from 1st April from Show Secretary, Jack Jeffrey, 13a Woodland Avenue, Bournemouth BH5 2DJ, Dorset. (S.A.S. would be appreciated).

14th May: SOUTHBEND, LEIGH & D.A.S. open show at St. Clements Hall, Leigh-on-Sea, Essex. Show Secretary: D. M. Cheswright, 2 Cedar Avenue, Wickford, Essex. (Tel: Wickford 2531).

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

JUNE

4th June: SWINDON A.S. open show at Park South Community Centre, Ceanmore Avenue, Swindon. 1st place trophies as well as perpetual trophies. Show Secretary, Mr. C. E. Curran, 78 Beech Avenue, Swindon, Wilt. (Tel: 0793 32920).

8th June 1983: SUDBURY A.S. 11th open show at Neasey High School, Quainton Street, Neasden, NW10. Further details from Barry Witteridge (tel: 01-904 0824).

AUGUST

8th August: NORTHERN GOLDFISH AND PONDKEEPERS SOCIETY 7th open show at the Sports Centre, Silverwell Street, Bolton, Greater Manchester. Details and entry forms from R. Hodgkinson, 9 Stratford Close, Farnworth, Bolton BL4 8LZ. S.A.S. with application please. (Tel: 0204 75281).

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We apologise for reprinting the following article which was originally featured in our December issue and incorrectly ascribed to Mr Jack Hems. However, in the interest of future research it is of the utmost importance that correct authorship should be firmly established. We regret any embarrassment or inconvenience to Mr Jack Hems and Mr David Sands caused by this error—Editor

PIMELODUS PICTUS

by David Sands



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 *Pimelodontidae*—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.

- Literature cited.
 1965 Axelrod, H. March T.F.H. (loose leaf F478.30).
 1890 Eigenmann (CH) & Eigenmann R.S. Proc. California academy of sciences. Vol 1 a revision of the South American Nematoognathi or catfish 1: 1-508.
 1874 Mees, G.F. The Aucheniperidae and Pimelodidae of Surinam (zoologische verhandlungen) zool. velt. 132: 130-182.