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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



The Marine Aquarium in Miniature

(Colour Feature)

Feeding Catfish in Aquaria

SPOTLIGHT: **The Blue Tetra**



COVER STORY by M. Gilroy

Platies, along with the other "top" livebearers, the Guppies, Swordtails and Mollies, are so popular that one can go into any fish shop, virtually anywhere in the world, and expect to find, at least, one variety in stock. This is, of course, quite understandable since it is difficult to find any faults with this fish. It is attractive, colourful, lively, robust, generally peaceful, adaptable, prolific and inexpensive. Furthermore, it is found in numerous fin and colour combinations, brought about by selective breeding and hybridisations between the two common species, *Xiphophorus maculatus* and *X. variatus* and their close relative, the Swordtail, *X. helleri*. This practice has become so widespread over the years that very few genuinely "pure" wild strains of Platy ever become available commercially. Wild-type stocks are, however, maintained by members of specialist societies, such as the Southern Livebearers Aquatic Group (S.L.A.G.—UK). Some members of organisations like S.L.A.G. are also interested in maintaining and improving cultivated varieties of Platy and other livebearers. Such moves are to be complimented since it is only through the dedication, patience and determination of specialists (be they hobbyists or commercial breeders) that the full potential of the Platy and its relatives can be exploited.

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Advances in the Study of Fish Parasites

IN THE ten years since I wrote *Diseases of Aquarium Fishes*, great advances in knowledge of all kinds of fish parasites has occurred, with the most important work conducted on the most problematic parasites. This comes as no surprise, as advances in aquaculture have been required by simple economics and these advances could not occur without a strong commitment to disease prevention and control. This story begins a series on recent advances in all phases of fish diseases. I will be referring to many recent scientific papers which are available at any university library.

Classification schemes for parasitic protozoa change all the time and are not particularly important for aquarists, at least on the higher levels. Classification only becomes important, as a practical matter, when it sheds light on differences and similarities that can be related to life cycles and control. In this instalment, I would like to begin with the flagellated protozoa (Mastigophora) and the ciliated protozoa (Ciliophora). I won't cover all species or genera, but hit the highlights. Otherwise, we'd never get through!

The major genera of fish parasites listed in Glen Hoffman's *Parasites of North American Freshwater Fishes* are, within the flagellates, *Oodinium* (to be updated below), *Euglenosoma*, *Trypanosoma*, *Lamelliasoma*, *Cryptobia*, *Colponema*, *Bodomonas*, *Costia*, *Urophagus* and *Hexamita*.

The flagellates are sometimes, in part, classified among the algae in the plant kingdom. We'll consider them Protozoa, since it is legitimate

by

Robert J. Goldstein, Ph.D.



Rhizocysts are too fine to be seen in this section of *Piscinoodinium* imbedded in a *Nothobranchius* killifish. *Piscinoodinium* cause velvet and pillularis

to handle them either way. One of the simplest groups of flagellates contains the organisms that cause velvet disease in freshwater, brackish and marine fishes. One of the first reports of these organisms, previously known only from invertebrates, was the classic finding of Brown at the New York Aquarium, who described *Oodinium ocellatum*. Later, Brown recognised that *O. ocellatum* was just not a typical *Oodinium*, and changed the name of the new fish parasite to *Amyloodinium*. Some years later my good friend Don Jacobs described the first case of a freshwater member of this group, which he called *Oodinium limneticum*. This became the classic cause of what was to be known as velvet disease of gouramies and other anabantoids. Later, it would prove to be a bane of killifish fanciers as well. At about the same time, the German aquarist Schaperclaus reported another new parasitic dinoflagellate, which he

called the *pillularis* organism. It too was subsequently placed in *Oodinium*, and the issue of *Amyloodinium* received little attention. After all, the important thing was which critter it was, and not which name was better. Finally, just recently, two papers appeared in the scientific literature on this 'same' creature. One paper referred to it as *Oodinium ocellatum* (*Journal of Fish Diseases*, 1981, pages 523-525) and the other as *Amyloodinium ocellatum* (*Gulf Research Reports*, 1980, pages 403-413). (Can aquarists be blamed for not knowing which name to use?) In short, the findings on both papers were this: the parasite can invade the internal organs, including muscle, connective tissue and kidney. 'It' is very invasive on a wide variety of hosts, and can cause severe outbreaks leading to mass mortalities with symptoms suggesting death by lack of oxygen. The fish show gasping, spasms, and unco-ordinated movements. The bugs get on the eyes, in the gills, skin, fins, around the teeth, in the nasal pores and lateral line pores, and in the intestine. In closed system marine aquaculture facilities, it can be devastating.



Lateral line eruptions can be caused by many parasites, and even by toxic water



While some *Cryptobia* are ectoparasites, others invade the blood. Here we have an infection of many parasites in the blood of a salmon.

Now the classification of this very confusing group of difficult organisms has received the attention of the famous Czech protozoologist, Dr. J. Lom of the Czechoslovak Academy of Sciences in Prague. Lom reviewed the early history of the group, some of which I reported in the introduction to this epistle, and then went on to carefully study the attachment organs and internal structure of the various reported species. This is the new classification.

Oodinium. This genus contains parasites of tunicates (primitive relatives of backboneed animals) and possibly polychaete worms. Polychaetes are the typical marine worms you see with nasty pinchers and often bushy appendages along their sides, unlike earthworms, which are in a different group. We no longer use this generic name for fish parasites.

Amyloodinium. Typically, these are external parasites of marine fishes. While usually on the gills, they can occur anywhere on any surface. The parasitic feeding stage (trophont) has an attachment disc that penetrates into the skin of the host fish. In addition, there is a narrow, moveable tube (the stomopode) which extends from the attachment end of the parasite. Its function is unknown. Mortalities observed in aquaria, but not in nature.

Crepidodinium. Another external parasite on the gills of marine and estuarine fishes. The attachment structure is not a disc, but an amoeba-like structure which tends

to form grasping fingers at its ends. There is no stomopode. This one doesn't destroy host cells, and may be symbiotic rather than parasitic in the strict sense. Known from estuarine killifishes and perhaps other fishes in brackish waters as well.

'Oodinioides'. This one, under the name *O. vastator*, was reported by Reichenbach-Klinke to occur on a great variety of freshwater fishes, getting all over the surface, and into the body organs including liver and intestine. Lom casts a baleful eye on this so-called dinoflagellate, noting that there are no structures reported, only strange squiggles that are supposed to represent a 'parasite.' Lom all but buries this genus in an avalanche of criticism, apparently entirely justified.



Many fish-infecting blood protozoa are transmitted by freshwater leeches.

Piscinoodinium. An ectoparasite on gills and skin of freshwater fishes, which occasionally gets down below skin level. The attachment structure has numerous radiating rods which extend down through the skin of the host. These rhizocysts are very distinctive and unique to the genus. There is no stomopode. This is the causative agent of pillularis disease and probably velvet disease as well, although there might be two closely related species. Also found, occasionally, on tadpoles of salamanders and frogs. Our most common dinoflagellate.

Ichthyodinium. Only a single species, resembling an amoeba, and occurring in the yolk sac of newly hatched pilchards (*Sardina pilchardus*). Not important to aquarists, but potentially important to aquaculturists.

Undoubtedly there are many more



This marine leech occurs on rays only, and may carry blood parasites.

species and genera of these parasitic dinoflagellates of the *Oodinium* type. We are not sure how their structures work, how they feed (some have chlorophyll but are parasitic as well), how host-specific they may be, or how organ or tissue-specific they are. We don't know a lot more than we know. Partly, it's because they are so difficult to study, and I can say that from personal experience in the laboratory. Lom's contribution goes a long way toward clearing up this most confusing, and probably under-rated, group of parasites.

You can get the original paper by Lom in *Folia Parasitologica* (Prague), volume 28, pages 3-11, 1981.

Cryptobia has received a bad press for many years as a dangerous pathogen which kills carp and other fish in pond culture. Part of the problem is that *Cryptobia* is probably more than one natural group, in my view. For example, there are species known that occur as blood parasites, just like trypanosomes. And there are others which occur as external parasites on gill tissue. Can these really be closely related?



The Ciliophoran, *Ichthyophthirius multifiliis* is the most common protozoan in freshwater aquaria. Infections can get very thick, causing death.



A close-up of a growing Ich trophont (feeding stage) in the fin of *Ctenopoma*

It appears that a good argument can be made for keeping them closely related, since we also know of trypanosomes that live in the sap of plants!

A recent report shows a massive *Cryptobia* infestation on the gills of marine and brackish water fish, with apparently no gill damage at all, thus indicating that this *Cryptobia*, at least, is a harmless commensal. For details, see *Journal of Fish Diseases*, 1981, volume 4, pages 519-522.

Very similar to *Cryptobia* are the internal, blood-inhabiting protozoa of the genus *Trypanosoma*. African sleeping sickness is caused by *Trypanosoma*, and certain species also occur in fishes.

A new species, *Trypanosoma magdalenae*, has been found in the Colombian cichlid, *Petenia kraussii*. There are other trypanosomes of freshwater aquarium fishes, including *T. mukasai* of *Tilapia* in East Africa, *T. choudhuryi* of *Tilapia* in culture in Asia, and about 25 so-called species (probably a lot less) from different fishes in Brazil. This very informative paper appeared in the *Journal of Parasitology*, 1980, volume 66, pages 1022-1026. Other reports of blood parasites in

fishes appeared in the *Journal of Fish Diseases*, 1979, volume 2, pages 469-479 (covering the northern Gulf of Mexico) and the *Canadian Journal of Zoology*, 1980, volume 58, pages 356-362 (covering fishes of the Pacific northwest of the US).

One final group of flagellates worth mentioning is represented by the genus *Hexamita*. Members of this group occur in a wide variety of fishes, but are particularly important in angelfish in aquaria. It is also known from discus, goldfish, and gouramies, as well as other fishes. The bug occurs internally in angels and can really be thick in the intestine. They also spill over into lesions in pores of the body and can cause grave ulcers on the head and other surfaces of fish. The parasites are thought to compete for nutrients in the intestine of the host fish, causing severe debilitation which finally results in a die-off, progressing slowly.

Dr. John B. Gratzek of the University of Georgia (USA) Veterinary School has studied this problem, and concluded that a very effective treatment is Metronidazole, added directly to the aquarium water at the rate of five parts per

million (=milligrams per litre). There is a possibility that the fry may carry the organism, and a series of two treatments might be wise to clear up a tank of breeders with young. Gratzek reported his findings in the trade journal *Pet Age* (USA), and noted that this drug is often used to treat human vaginal infections with *Trichomonas*. Your physician can prescribe it for you, and I suggest that Mr. Fishkeeper (not Mrs.) get the prescription filled (preferably in a distant village).

Another recently reported cure for the disease is Nifurpirinol at the rate of 0.2 parts per million in a bath and in the food (*Journal of the American Veterinary Medical Association*, 1980, volume 177, number 9). Your local vet probably has a copy in his office. If you don't have a dog or cat (and thus a vet), talk to a neighbour who does (but don't ask her to also get you the Metronidazole).

With the Mastigophora thus covered (however briefly), let us move on to the Ciliophora. In this group we have the genera *Trichophrys*, *Balantidium*, *Nyctotherus*, *Ichthy-*

ophthirius, *Cryptocaryon* (marine), *Glaucoma*, *Chilodonella*, *Amphileptus*, *Scyphidia*, *Glossatella*, *Epistylis*, *Zoothamnium*, *Carchesium*, *Tripartiella*, *Trichodinella*, *Vauchomia* and *Trichodina*.

There are two papers that recently appeared which I find of some interest. You will recall that I recently described how to raise marine fish larvae, the outgrowth of work at many laboratories on the aquaculture of commercially important species that can be grown at coastal facilities or in synthetic sea water inland. One of those facilities is in Florida, where attempts are underway to grow the commercially valuable red snapper. (Incidentally, our American red snapper is a member of the family Lutjanidae. The red snappers I saw in Greece were members of the Mullidae.)

This particular Florida laboratory had difficulty with outbreaks of *Cryptocaryon*, or salt water "ich", which often resulted in severe mortalities. As a result, the lab tried many methods for control. The results, reported in *Aquaculture* (1981, volume 22, pages 181-184) included the use of quinine hydrochloride and chloroquin (both anti-malarial drugs). The doses used were 2.64 mg per litre of quinine and 10.6 mg per litre of chloroquin (in combination) followed by 3.96 mg per litre quinine and 15.9 mg per litre chloroquin (a 50% increase) two days later. At the same time, the fish were exposed to elevated salinities of 45 parts per thousand (0/00) to 60 0/00. Normal sea water is about 32 0/00. It was found that higher salinities killed the parasites and caused the fish to slough off excess mucus, but also caused them considerable stress. This approach gave equivocal results, since the fish were very sensitive. But it is important to recognise that, while some fish can be exposed to lowered salinity as a means of parasite control, other fish may respond better to an alternative strategy of elevating the salinity. It is important that this be used only as a dip, because excessive exposure (more than five minutes) could

cause extreme stress and severe damage to gill tissues.

These authors also tried malachite green, copper, formalin and some other traditional remedies, and found that they did not work on red snappers, which are reef (not estuary) fish.

In a recent article in *Pet Age* (February, 1981), Jim Robinett of the John G. Shedd Aquarium in Chicago described recent studies on the parasitic protozoan *Epistylis*. He noted that many authors doubted whether this was a commensal or a true parasite. It can, he stated, be found living free, growing on the walls of fish culture raceways, and elsewhere in dirty aquaria. Occasionally they get all over fish, and then can be very erosive of the fish's tissues. When this happens, secondary invasions by bacteria take place, and the fish are killed. For this reason, it is worth controlling *Epistylis*.

Robinett uses a combination of

malachite green and formalin in a strict regimen. Commercial solutions of Malachite Green are used according to package directions (usually 1 drop per gallon of 0.7% solution). The formalin is used somewhat differently, but in combination. For warm water aquaria (above 59°F), he uses 166 parts per million (mg per litre), which is the same as 0.63 millilitres per gallon. Coldwater aquaria require higher doses (almost 1 ml per gallon for water less than 50°F). The tank should be treated for five to seven days, with a substantial water change every day, and that means as much as you possibly can change. *Epistylis* looks much like a rotifer, but rotifers shouldn't occur on fish! (At least, not good rotifers.)

In stained section, the typical C-shaped nucleus of *Ichthyophthirius* is sufficient for accurate diagnosis of the disease agent. Note that the trophonts can grow right onto one another in thick infections



WHAT IS YOUR OPINION?



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

'Photographs by the Author'

I'M WRITING this in the middle of August in what has been, in my opinion, the very worst summer I can remember. A couple of days ago my back lawn was flooded, and floating on the top was a layer of ice formed from a downpour of hailstones. Last year my lawns were burnt brown and required little cutting. This year they have been continuously soaked, my only consolation being that the lower-than-usual temperatures have retarded grass growth and lawn-cutting has not been as big a problem as in normal years—whatever they may be. Lots of bored, teenage pupils have written to me during the summer—just for something to do. One of them, Mark McKnight, whose aquatic experience is limited to his young brother's two goldfish wrote: ". . . It beats me where all the water has come from. It seems as if it has rained the world's total water content several times over. . . ." I know what he means!

Things haven't been any better indoors. Recently I mentioned my barbs' tank having lost all its fish. Next to be struck was my 30 in. x 15 in. x 15 in. tanks housing gouramies and my beloved pair of giant, old clown loaches. Both loaches died! And so did a couple of the gouramies.

I treated the tank with a cure for Oodinium, made by Sera, but the treatment was begun too late. I thought I had no chance of saving anything in the tank—but I was greatly pleased when the progression of the disease on three of the gouramies appeared to slow down. Soon the progression stopped and the fish—one golden and two blue gouramies—began to look healthier and brighter. The three fish survived and now look quite healthy and normal again. Early on I also changed about 50% of the aquarium water and I raised the water temperature a few degrees before adding the cure. I suspect that one fish died, decayed in amongst the plants, and caused all the fish to develop a disease. The cure is certainly worth a try; but, sadly, it was not used in time to save my beautiful clown loaches. I don't think I'll replace them.

I put four neon tetras in the previously-infected barb tank and the fish seem to be thriving without any signs of disease. I washed nets and such items in a solution of potassium permanganate in water. If you use it, be careful that you do not get brown stains on your hands, clothes, sinks, etc., because the purple crystals/solution tend to stain items brown.

Mr. Eric Small of Hillside Aquatics sold me a new coil for my Zoobeko air pump and I'm happy to say that it is now working well again and operating four outside filters.

This morning, through the post, I received a copy of *SLAG*—not the most attractive name for a magazine about fish. It's issue No. 25 of the Southern Livebearers Aquatic Group and bears the title *The Livebearer World*. It's ably edited by Pat Lambert. As a life-long guppy fan I was pleased to see an illustrated article about this most popular fish. Varieties of guppy named are: roundtail, Robson, pintail, top sword, bottom sword, double sword, lyretail, scarftail, speartail, cofertail, superba female, veiltail, fantail and trianglerail. I assume that the latter is the name now used for what I used to call the delta-tailed guppy. The interesting *Journal* contains a variety

of other stimulating material—including photographs and diagrams.

Mrs. Jan Mallett is the newly-appointed Publications Officer of the Association of Aquarists, and she lives at 31 Overstrand, Aston Clinton, Bucks. She sent me two of the Association's latest booklets: *Goldwater Fish* and *Barbs*, price £1.25 each. Supplements will be available at a later date. Both books are well illustrated with drawings and the factual information in them is well presented. One minor suggestion: both books would be improved by the omission of the foreword by the Chairman of the Association of Aquarists. Sentences such as ". . . Better understanding of the aquatic world may provide us with an object view of our own roots. . ."



Convict cichlid—*Cichlosoma nigrofasciatum*

(from Foreword to *Goldwater Fish*)—whether taken in or out of context—means little to me. One other suggestion—about *Barbs*—let's have lengths duplicated in inches as well as mm. I'm so ignorant that I have not the faintest idea of the length of a 120mm. long-finned barb. A ruler giving both scales suggests that it's about 5 in. or so—which I do understand. Readers should find these publications interesting and useful—especially when further species are covered in additional pages, and when an index is finally provided.

Photograph 1 shows a convict cichlid, *Cichlosoma nigrofasciatum*; and picture 2 is of one of my lace gouramies, *Trichogaster leeri*, which is long-since gone. Please send me details of your experiences with either or both species.

I notice from the August 1985 issue of the *Magazine of the British Koi-Keepers' Society* that their KOI '85

show was to be held yesterday, 18th August. I hope it was a big success. It's fascinating to see so many specialist koi retailers advertise in the B.K.K.S. Magazine.

Mr. Lorenzo Porrelli, writing from 174 Pappert, Bonhill, Alexandria, Dunbartonshire, last wrote to me in 1981—when I published his letter in the November '81 issue. In his letter Mr. Porrelli asked if any aquarists, living in a small town as he does, would like to write to him and exchange ideas about fishkeeping, breeding, equipment, etc. The publication of his letter brought forth 43 replies, and for three years Mr. Porrelli corresponded happily with numbers of readers—until his health began to fail and he was no longer able to correspond. A serious disease was discovered; but after a course of specific treatment Mr. Porrelli's strength is slowly returning and he has resumed his life-time hobby of fishkeeping. I'm delighted to find his being able to write to me again. He says: "As most aquarists know, sexing angelfish, even when they are adults, can be difficult. I have been studying this problem and I think I have found an almost-foolproof way to distinguish the sexes at about six months old. If you can get a head-on view of the angelfish you will see the different shape just in front of the ventral fins. In the female this part is more rounded, like a capital U; in the male fish this part is pinched like a capital V. Nine times out of ten it seems to work.

"I would be interested to hear from other aquarists who have angels around six months old to learn if the method works for them too. I always take the eggs away from the breeding pair. I place the slate or leaf on which the eggs were laid in a bare tank, and add enough methylene blue to tint the water a very deep colour. This helps to keep fungus at bay. I also place an airstone near the eggs to keep the water moving around them. As soon as the fry become free-swimming I feed Liquifry for five days, then Biol for a further five days. After this I feed newly-hatched brine shrimps and Aquarian egg-layers' powder, and gradually

start them on crushed flake food, making sure it is small enough for them to eat. At about eight weeks I start to feed Aquarian Growth Food. They grow very quickly on this diet.

"During this feeding programme lots of water changes have to be made to keep the water clean and sweet. Food should be on offer at all times until the tank lights are turned off. After 12 weeks of this treatment the fish should be of saleable size. There is a great satisfaction in rearing 50 or so angels to adulthood. To keep them in a tank of their own would really take a tank of 60 in. x 15 in. x 18 in. to allow them to grow to a decent size—but what a sight to behold in a well-planted tank. For a tank of this size your filter system would need to be able to turn over 500 or 600 litres per hour; and water changes will still have to be made every two or three weeks.

"I am now 68 years old and would recommend fishkeeping to old-age pensioners. It is a great therapy. It also gives you a good reason to get up in the morning, and it keeps your brain alert; and of course you get a lot of pleasure just sitting and watching the fish.

"I will sign off now because I know how limited space is now. I wish to thank all the people who were kind enough to write to me, and to explain the reason for the sudden stoppage of

keeping in touch." (I hope your health will continue to improve, Mr. Porrelli, and that you will write again soon. I hope that some readers who keep and breed angels will write to Mr. Porrelli, as so many did when I made the request before, and that they will not mind if his illness prevents him from writing early replies. B.W.)

I must say I've been rather disappointed by the response I've got from readers of late. What's happened to the pen or typewriter? Have you been sunning yourself on a foreign beach; or spending the lashing wet summer in front of your TV watching films on video. I've done a fair amount of the latter and been disappointed by the vast array of dreadful films in many video libraries. Needless to say, I have not borrowed any of the array of horror movies. As a child of the Fifties and teenager of the Sixties I still prefer to see big-screen movies in a cinema—even if it's ageing James Bonds who should have the good grace to retire. By the way, have any readers made good video films of fish in ponds or aquaria? If so, please drop me a line. Despite the rainy summer I've taken hundreds of coloured shots of some of the many beautiful sights in Northern Ireland; and some of a small area of Scotland as well. If an opportunity ever arises, take yourself to Ulster and travel round the North Antrim coast. Few areas in the world can match, never mind better it.

Lace gourami—*Trichogaster leeri*



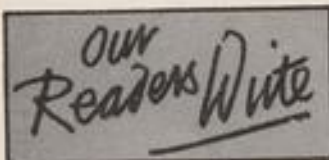
Mrs. Margie Rutland, of 34 Ellington Road, Feltham, Middlesex, tel: 01-890 6100, hopes to form a London-based group of the Anabantoid Association of Great Britain. She asks if I'd be interested in coming along. It should be monthly and the first meeting will be on Wednesday 18th September—which will be long-past by the time you read this. As I live in Northern Ireland I'll decline the kind invitation—and suggest that the G.B. bit be extended to U.K. to cover N. Ireland as well. Interested readers should contact Mrs. Rutland direct. I note that the A.A.G.B. is carrying out a census of members' fish for various reasons.

My two blue gouramies and one golden gourami won't enhance the Association's statistics very much!

Mr. T. Flack resides at 14 The Arcade, Bognor Regis, Sussex. He says: "We placed a sucking loach in our community tank; and you can imagine our surprise when we noticed that it was inside the under-gravel filter tube. We took the top off and left it but it seemed quite happy there, even disappearing under the gravel. Eventually we got it out by waiting until it was half-way up the tube and then turning the air-flow on at its highest level until the loach was forced back into the tank by the flow of air and

water. Well, that was that, we thought, and put the top back on. Not so. The loach obviously thought this was great fun and repeated the trick three or four times—until the only way to stop him was by threading cotton round the outlet so it was too small for him. This did not impair the performance of the filter; but the loach did not seem so jolly again!"

For next time send me your opinions on (a) breeding guppies; (b) koi keeping; (c) water lilies; (d) external filters; and (e) feeding marines. Good-bye for the present.



On Having Our First

The idea of having our first was conceived just over nine months ago. Then, we never thought of the labour involved in bringing an idea to fruition.

Our first attempt to find our baby a home miscarried very badly on receipt of the invoice, so a less expensive home had to be found; the local community centre answered our problem.

Trying to find godparents to sponsor it took a lot of legwork around local industries and businesses, luckily we found a few caring people.

Along with the kindness and generosity of many firms concerned with the hobby our baby looked to have a sound footing.

Annual trophies were found from present and ex-members along with sponsorship of class trophies, for these we are very grateful.

Food and drink for its christening had to be found; again members, generous to a fault, made it all possible.

The big day finally arrived, and all

parents (members and committee) were on tenterhooks hoping that all the invites had been accepted and that everyone would turn up. Our worries were unfounded; to say we were delighted would be an understatement, there were 410 exhibits on display, the highest at any show this year, at the time of writing.

Most people were generous in remarks on all aspects of the show and even more generous with their money, we more than broke even.

The judges were on the ball as well, all judging was completed in 3 hours and the last card winning exhibitor was on his way home by 6 o'clock.

We are now looking forward to our second show next year.

May I, on behalf of the committee and members of the Skelmersdale & District Aquarist Society, thank everyone who helped, exhibited and donated towards our first and very successful open show.

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OBITUARY

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Chief Executive, King British
Aquariums Accessories Limited

The aquatic trade loses a pillar of the post-war tropical fish supply chain. On Thursday 11th July, Tom Faithful died at his home after a long illness. Former member of the Willesden Aquarist Society, Tom was a much respected and loved member of the aquatic trade.

His real joy was in the breeding of fish and raising tropical plants, which began as a hobby in 1947 and later in the early 60s took a partnership in what was then known as Kathleen's Fisheries in Holborn, London. The company soon became Faithful Fisheries, supplying imported fish to the trade throughout the country.

Tom was a very kind man always willing to help and guide people.

His greatest regret was the increase of imported fish, a result of the 1972 oil crisis which caused the crippling oil costs of maintaining fish breeding in this country.

The business has been run for the past 10 years or so by Tom's brother Dom, and Tom's son David who now will be taking over from his father.

Tom leaves a wife Doreen.

News and Information

Tunze Aquarium Technology

For 30 years, Norbert Tunze, Head of the Tunze Organisation, has studied and experimented with aquaria of all kinds. Over the years, it became obvious that the successful periods for an aquarium were based on associations which were more likely to occur by chance rather than design, i.e. they could not easily be repeated at will. This appeared, however, to have been greatly affected by the way in which the aquarist, responsible for the aquarium, looked after it and also the capability of the filtration equipment to produce definite, high quality results, thereby assisting their effort and attention. These conclusions have continually led to the development of technical equipment, the main definition for which, i.e. *Aquarium Technology* was coined by Norbert Tunze in the '60s and is now used throughout the field.

Aquarium Technology, as we understand it, means producing optimum living conditions for the occupants of aquaria, with the technical facilities "currently available"! The *Tunze System* represents the future of the home aquarium by offering a range of reliable units, made to high standards, from the most suitable materials available for aquarium use so far developed. The *System* consists of individual units which are fitted on to glass-fibre reinforced mounting bars in a configuration to suit each individual aquarium's needs.

The foundation, as it were, of the *Tunze System* is the *Quick-Change Filter*, which is available in five different sizes; it enables high speed prefiltration for volumes of fresh water of up to 440 gallons and for sea water up to 220 gallons. For larger volumes, the number of systems can be increased according to the volume to be filtered.

The power for the various sizes of *Quick-Change Filters* is supplied by the renowned *Tunze Turbelle Centrifugal Pumps* which have been developed especially for aquarium use. They have a direct drive which is not subject

to the power losses of the magnetic drives so widely used for aquarium power filters. We achieve sustained high output and combine the advantages of high performance and low power consumption with easy handling and reliable operation. Their operation in both fresh or salt water is both quiet and almost maintenance free over many years. The heart of the pump is a robust spit-pole motor with extra long life, heavy duty and pre-lubricated bearings. The motor windings are sealed in epoxy. The motor is fitted with a thermal switch. All pumps from 2000 l/h are provided with an additional thermal fuse. The transparent polycarbonate impeller housing is easily removed for cleaning without the use of tools. It can be rotated through 360°. *Turbelle Pumps* come in 6 models from 200-4000 l/h pumping rates. Filter connections are all alike and in most cases they are inter-changeable.

The unit next in line to the *Quick-Change Filter* and which, if incorporated, must be immediately next to the filter, is a unit called the *Osmolator*. This unit measures the evaporation from the aquarium and automatically replaces the evaporated water from a separate storage container on a constant basis, minute by minute, 24 hours a day. Also incorporated in the *Osmolator* is a highly efficient surface extractor for removing surface active waste, thereby improving the gaseous exchange at the surface.

The next unit is named a *Bio-Reactor* and is one of the great strengths of the *Tunze System*. It is supplied with pre-filtered water and has two parts; one part housing nitrifying bacteria above the water where they breathe atmospheric oxygen, and a submerged chamber with a denitrifying capability, enabling water changing to be reduced. The *Bio-Reactor* probably represents the best "in-aquarium" bacteriological waste disposal system available today.

For marine aquarists, we can go on to offer a valuable unit in the realms of waste disposal. The *Tunze Automatic Protein Skimmer* can remove up to 80% of the dissolved organic waste from your aquarium and these skimmers are specially designed not to damage the plankton because they are unique in operating by the diffusion principle. Two models, 215 and 225, offer you an interfacial capacity (surface of area treated) of approximately 14 acres and 24 acres respectively in 24 hours, suitable for volumes of 132 and 264 gallons capacity. One advantage of the *Tunze Protein Skimmer* is that it can be operated with great success in invertebrate aquariums due to the diffusion principle of operation which is largely not the case with other types of protein skimmers or ozone reactors.

A further example of the use of technology by *Tunze* is an electronic controller aptly named the *Power Timer*. After realising the importance of turbulence to the well-being of all forms of aquarium life, fish, inverts, plants, algae and microbiological forms, attempts have been made in the past to bring these currents into captive aquariums. Most were large and expensive machines developed mostly at public aquaria and research institutes. The importance of these requirements led to the development of this electronic instrument with which the constant flow of the *Tunze Turbelle Pump* can be converted into pulses of adjustable power and duration, introducing turbulence by waves of pressure into the aquarium resulting in healthier conditions and improved circulation around decorations, and so called dead spots are eliminated. In the Tropics, the wind and waves die down at night and fish rest peacefully, their metabolic rates reduced. To simulate this effect, the *Power Timer* switches off the pulses at night by means of a photo-electric cell affected by the aquarium lighting going off and the pump then runs constantly on reduced power until the normal lighting level is resumed. Also incorporated is a food timer enabling the filtration to be switched off during feeding and automatically being started again after a short period.

Tunze Systems, using *Turbelle Pumps*, combined with the correct filtration

THE AQUARIST

system, can solve practically any kind of aquarium filtration problem, assisted by various test kits, and a very comprehensive range of electronic measuring instruments to confirm the results.

The *Tanze System* already enjoys a prominent place on the shelves of the vast majority of specialist aquarium shops throughout the rest of Europe. The growth rate for the acceptance of the *Tanze System* in the British Isles is taking place at a tremendous rate to the extent that sales have more than doubled over the last couple of years. This has been caused by a greater awareness by the aquatic trade of the advantages of using the *Tanze System*; by the fish keeper, informing himself better about the higher levels of aquarium technology, and therefore demanding such from his favourite dealer, but mainly, to a continued intensive effort from the country's leading aquatic wholesaler.

Over the last seven years, Norwood Aquarium Limited have continually and steadfastly extended the *Tanze Product*, especially in the South East of England, to an ever increasing amount of dealers by maintaining good stocks, regular deliveries and assistance where information about a technical product, especially in the earlier days, was extremely important.

Clear-Seal launches new catalogue

CLEAR-SEAL, established 10 years ago, is now one of Britain's largest aquarium manufacturers. Based in Birmingham, the company has recently moved to new premises of 10,000 sq. ft. in Bordesley Green.

Up-to-date automatic cutting and cleaning equipment has increased Clear-Seal's production tremendously in the polishing and drilling of glass, enabling skilled designers and craftsmen to build aquariums and cabinets of any size or shape to suit individual requirements.

A new catalogue of products launched in September, includes new items in the extensive range of aquariums, cabinets, stands and accessories; a twin pack of aquariums in various sizes, condensation trays, and self-assembly stands in plastic coated strong gauge metal. The attractive new bow fronted tank, available in two sizes, complete with two

door base unit, features on the front cover of the new catalogue.

New oyster board red, white and blue packaging enables stockists to leave Clear-Seal units packaged and protected from damage while on display in showrooms. Aquariums are all packed with protective cardboard end pieces, and five year guarantee against leakage.

In addition to supplying the range of products in the catalogue, Clear-Seal also design and build large aquariums and oceanariums with vision panels. The company will also liaise with local authorities on planning permission.

Michael Thompson, Managing Director of Clear-Seal says: "Our new products complement the basic range of high quality, aquariums and cabinets, and will give a wider choice of equipment for our stockists to sell".

Contact: Michael Thompson, Clear-Seal Aquariums 021-771 0266. Tina Timms, MW Consultancy 021-773 9381.



New director for King British

Keith Anderson, a well-known and popular figure in the pet trade, has been appointed sales and marketing director of King British, one of the leading flake fish food and medication manufacturers in the country.

Announcing the new appointment, Keith Barraclough, the company's chief executive said: "Keith Anderson will bring to our operation a level of professionalism and experience so necessary to meet the new opportunities we have identified for our future business development programme."

"In the last two years, we have invested more than £1m in modernising

buildings and plant and that has provided us with just the right spring-board for the future. With Gordon Holmes responsible for technical operations and Keith in the commercial seat, we will now have a management team of real standing and strength in the industry."

Previously a management consultant, Keith Anderson has spent 16 years in the pet trade with considerable experience in the sales and marketing functions, both in the home and overseas markets.

New products, new catalogue and a new stand for Lotus at GLEE

EXHIBITING at the 10th anniversary GLEE show in October on stand A3 in Hall 1 at Birmingham are Lotus Water Garden Products Ltd, the world's leading manufacturers and distributors of products for the specialist water garden marketplace. A completely new and revised catalogue, their now familiar 'Everything For The Water Garden' manual, will be available on the stand at GLEE and 15 new and previously unpublished products will be included and shown on the Lotus stand.

Lotus' Baby Otter pump, launched in April '85 and not before included in a Lotus catalogue, had sold many thousands of units before the end of July and will be one of the company's principal exhibits. Lotus are also launching the Otter Premier I and Premier II models with performance characteristics similar to the familiar Otter 42 and 52 models but carrying price tag reduced by some 40%.

Two new glass fibre pools are to be shown for the first time: models Egret and Ibis, the former a kidney shape, the latter a half round. Lotus have discontinued all mock rock and paved edges from their range and have also dropped their blue pools in favour of grey; stone remains the most popular colour.

New lights, ornaments and pool liners are to be launched by Lotus, who are also appearing on a totally new and redesigned stand. Some 15 products will be shown for the first time at GLEE '85 and will appear in the Lotus catalogue for '86.



Goniopora Coral. Very easy to care for

The MARINE AQUARIUM in Miniature

By Tim Hinitt

OVER the past fifteen to twenty years of keeping both marine and Freshwater fish I have had it drummed into me that it is almost impossible to keep Marine organisms in a tank of less than twenty-five to thirty gallons capacity. Whilst this is very admirable and I am sure that all of us would like to be able to maintain tanks of forty gallons upwards, it is not always possible for us to do so due to structural strength of the flooring and space available.

A year ago I had an alcove in which I could place a 24 in. x 12 in. x 15 in. tank and I decided to attempt to keep a very small marine set up in this space.

I understand that the tank in question has an empty capacity of some fifteen gallons. Very much smaller than that normally recommended.

I duly decided to set this up and used the conventional undergravel

filter covered with a 2 in. layer of coral sand. In my large tank I use Sicce and Eheim power filter heads to operate the undergravel filter but in the small tank this would have been totally impracticable. Instead I used standard airlifts powered by a fairly large airpump. This method has an added advantage in that the filtered water, normally very deficient in oxygen, is aerated substantially by the air pumped into the system.

In my large marine tank I use coral as a backdrop to the fish and their surroundings but in the small tank I felt that this would displace too much water and therefore decided to utilise the German ceramic rock, which is very light and porous and displaces relatively little water volume. As in the larger marine tank I also decided to use an additional beech wood air stone which provides a very

strong and fine flow of bubbles. Very helpful in the displacement of carbon dioxide and certain other harmful gasses.

This small aquarium has been running successfully now for the past nine months and really has a very large number of animals for its small capacity.

The Invertebrates consist of two Brittle Stars (*Ophiomastix* sp. and *Ophioplocus japonicus*) which, contrary to the publications I have read, are quite easy to keep and are also very entertaining in their behaviour. They are especially active when any food is placed in the tank and will emerge, be it day or night, actively searching for anything edible. Unlike the true starfish, however, they are not aggres-

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THE AQUARIST

ON THE TEST BENCH

by Ian Sellick



Electronic thermometers

ELECTRONIC Temperature Instruments produce a useful range of portable electronic meters, their pH meter already having been reviewed in these pages. Now, there is a new electronic thermometer retailing at about £45. Simplicity itself, these thermometers have only an on-off switch, and give a reading on an LCD display to an accuracy of one degree, good enough for aquarium use. The temperature probe is detachable, fitting into the top of the unit via a small plug. With a three foot cable, this probe can be placed anywhere in the aquarium to measure temperature in odd corners, and allows the electronics box to be kept well away from the water.

Other probes for air, surface temperature measurement and even cookery can be supplied as optional extras and plugged in. Another accessory is a switchable junction box allowing connection of up to six probes to the single read unit; useful if you wanted to monitor six tanks, I suppose.

Also part of the range is the Miniature Digital Thermometer, which at only £39.50 inclusive of postage direct

ETI — Electronic thermometer — a neat small unit

Left: Model with 0.1° accuracy

Centre: Low cost model as reviewed

Right: Switch unit to allow 6 probes to be connected at once

from the manufacturers, is perhaps the most ideally suited to the aquarist's pocket. This model is accurate to one

The ETI miniature electronic thermometer. Just £39.50 complete with probe, post-free from PO Box 81, Worthing, West Sussex. BN13 3PW



degree and reads to the nearest degree centigrade. Again, the probe is detachable if required. Keep the box of electronics and the display well away from water, it is not very waterproof!

I have said before that for the aquarist, these electronic thermometers are more of a gimmick than having an absolute necessity value. However, they are of use for accurately checking temperature in inaccessible areas and are, of course, essential for anyone doing scientific studies (0.1 degree accuracy is available on another model); with a battery life of 200 hours, this would be a gadget useful in the field to record water temperatures when fish collecting, etc.

E.T.I. are at P.O. Box 81, Worthing, West Sussex.

King British

KING British have a range of bulk pool remedies, each of which will treat approximately 600 gallons. These include a general disinfectant, a potassium permanganate based product that is probably best used only to dip plants and equipment prior to introduction to the pond, rather than in the pond itself.

Paracide is for use against white spot and can be used as a dip for larger ectoparasites such as anchor worms and flukes. Judging by the colour, this appears to be a malachite green based remedy.

Fungicide may be used in the pool or as a dip and is a formaldehyde containing formulation. It has no warning label on the bottle which I believe it ought to have. Nor does Bactericide which similarly appears to contain this noxious chemical in combination with an acriflavine type dye, I believe.

The bottles these remedies are contained in are clear and marked (on the labels) at 100 gallon equivalent intervals. It is recommended on the label that the dose is mixed with a gallon of water before use. Not only a sensible precaution anyway as it prevents localisation of the remedy in the pond, but necessary in this case when it is quite difficult to gauge how much to pour out to reduce the liquid level in the bottle by the required amount.

King British formulations are generally quite good; an improvement in labelling and packaging would help these products.

Pond Remedies

RECENTLY introduced by New Technology is a range of concentrated formulations designed for use in ponds to control white spot, bacteria and algae, and remove chlorine. The four products are, respectively, Erad-Ick, Bact-Erad, Aquaclear and Aquasure.

As I have mentioned in this column before, fish cures and foods are rather difficult to actually test unless one has the appropriate problem to try them out on and the time necessary to make useful tests. Therefore my comments are merely impressions based on the formulations involved (where known) and based on such factors as ease of use.

All four preparations are in easy dose bottles that have a 10ml dispensing chamber built in that is filled by removing one of the two caps (the white one), and squeezing the bottle gently to fill the chamber. The contents of the chamber can then be poured out without spilling the rest of the bottle. This type of bottle is quite effective and saves measuring capfuls or counting drops that either lead to spillage or inaccuracy.

Erad-Ick is a malachite green-formaldehyde mixture that is used daily for five days at the rate of 10ml per 200 gallons. This is a classic formulation so I see no reason why it shouldn't work, allowing for absorption of the ingredients by the detritus often present in ponds. Building up the dose may help to prevent this being so much of a problem. The formaldehyde in this product is very strong, so great care needs to be exercised in using it; make sure you don't spill any onto your hands or clothing! This is the only one of the four products that actually states "mix evenly throughout pond water" on the label. This may seem obvious advice, but to my mind ought to be on every bottle of pond cure; ponds often don't circulate as well as aquaria, even with pumps and waterfalls, so dosing with any remedy via a clean watering can to cover the entire area is always an aid to dis-



persal, avoiding water lily leaves and the like of course!

Erad-Ick may be used, according to the label, when fish are gasping at the surface. I would be more inclined to worry about the real reason they're doing this; in 99 cases out of 100 I'd say it was not because they'd got anything malachite green and formaldehyde would cure; increasing aeration and water turnover, changing water for treated fresh and removing debris, locating source of anoxia is going to do far more good than pouring in chemicals.

Bact-Erad is another formaldehyde preparation, this time together with a combination of acriflavine-type dye-stuffs, used at the rate of 10ml per 40 gallons as a single dose. It says on the label it is effective against bacteria and flukes, but is no more specific than that. Again a problem in use is going to be the absorption of acriflavines onto any organic matrix in the pond, which will include plant debris. Without doing substantial tests (such as I trust the manufacturers have done) it is difficult to pontificate about remedies that claim to treat bacterial infections, especially when these include "red wounds and ulcers . . ." as stated on the bottle label; traditionally difficult problems, both to diagnose accurately and cure. Again many of the problems like this are due to poor handling and water conditions which can be best treated at source without resorting to the bottle!

Aquasure is a chlorine remover that also removes heavy metals, i.e. a complexing (chelating) reagent. These are all much of a muchness these days (with apologies to all those manufacturers who will no doubt disagree) and I expect no problems with this one. Used at a rate of 10ml per 40 gallons, the bottle will treat 1,000 gallons of new water.

Finally Aquaclear I find a bit difficult to offer advice on. A blue coloured dye, used at a rate of 10ml per 125 gallons, it is claimed to restrict the growth of undesirable weeds and algae. This will give "a pleasing clear blue colour" to the water. Personally, I like my water the way it is and while a blanket weed controller might sometimes be useful, preventing algal blooms by screening the pond with surrounding plants and growing more lilies is, to me, a better natural solution. Although the label says the product is harmless to all other forms of life in the pond, it does not specifically state it is harmless to higher plants.

Priced at £3.97 each, these 250ml bottles are easy to use, and if they work as claimed, are quite cost effective. Do make sure you are treating for the right reasons first though before dispensing chemicals into your pond; if necessary remove one or two fish for observation to a small holding tank rather than rely on from the surface judgements of conditions; not often the best vantage point to see what is wrong!



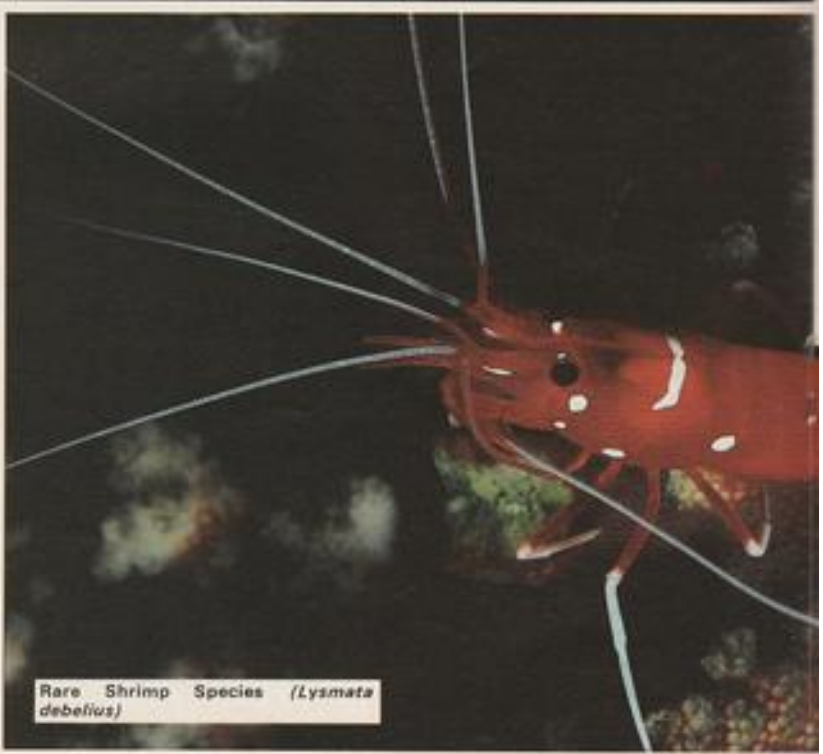
Lyre-tail Coral Perch (*Anthias squamipinnis*). Quite happy in a small tank but preferably in groups

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sive to corals or sleeping fish and can quite safely be put in with both of the former.

Also in the tank are three small clumps of Coral (*Goniopora lobata*) which appear very hardy indeed and do not appear to be affected in any way by the ageing of the water. By this I do not mean that they will tolerate nitrite or phenol which can accumulate if water changes are overlooked for too long a period, but utilising the same water for six weeks does not appear to have any ill effects on them.

The other inhabitants of the tank are two *Condylactis* anemones which position themselves near to the uplift from the airstone and never seem to move far from this position. These are fed once a week on lance fish and appear to be quite content on this quantity of food. I chose this variety of anemone as it is very easy to feed with reasonably large portions of food and does not burrow into the sand and therefore become adversely affected by the bacteria therein. They are, however, con-



Rare Shrimp Species (*Lysmata debelius*)

sidered to be a predatory anemone and have on occasions caused a problem with the jawfish (*Opisthonathus aurifrons*), which is one of the three fish included in the tank. The Jawfish has twice swum into one of the anemones and been quite obviously stung. Within twenty minutes he has recovered and resumed his normal behaviour but possibly a slightly less aggressive anemone would be preferable if fish are to be included in the set up.

Initially, three tubeworms were also included in the tank but of these only one is now existing. They seem to be particularly sensitive to either old water or insufficient food in that they shed their 'feather dusters' and then grow a new set which are much smaller and never attain their former size. I think this is probably caused by lack of food as I only feed liquid plankton once a week and this is probably insufficient but to

feed more of this rich diet would mean very frequent water changes.

One particularly successful member of the community has been a miniature Giant Clam (*Tridacna* sp.). This small mollusc, some three inches long, appears to thrive whatever the conditions. Possibly they are used to being exposed to the elements at low tide on the reef and are, therefore, well able to adapt to life in the aquarium.

Like the corals the clam is fed on liquid plankton once a week.

When this tank was first set up I had no intention of including fish in the system. However, after several months, I purchased the aforementioned Jawfish and found that he settled much better in the Invertebrate tank than in the larger aquarium for which he was intended. After this I also placed in the tank a Wreckfish (*Anthias squamipinnis*) and a small Grouper (*Pseudochromis* sp.). All three seem to be thriving and have had no adverse effects on the invertebrates.

On reflection I think I would have omitted the *Anthias* as this fish is best kept in a large tank in a group and does not show its best when kept singly being somewhat reluct-

ant to feed and tending to become thin. The fish are fed daily on frozen brine shrimp which is crushed into a pulp and then also supplies a supplementary diet to the invertebrates.

As yet I have omitted to include some of the very beautiful marine shrimps in the system. The cleaners, such as *Lysmata grabhami* and the magnificent *L. debelius* would make very welcome additions to almost any tank but they have one drawback in that they will constantly probe the corals and tubeworms. As can be imagined this does not have a very good long term effect on the latter. Possibly this phenomenon would not occur in a larger system with more space available.

Obviously with such a small tank, possibly holding only twelve gallons when displacement by sand and rocks is taken into account, it is necessary to change the water monthly. However, for the pleasure and enjoyment that this tank gives I consider this well worth while and I think many other aquarists hitherto put off by the need to have a large tank would also be well pleased if they were to attempt this venture.



Tubeworm in calcareous tube and showing feather-like appendages



Acanthops sp. A marine angel. Quite rare but suitable for tanks of 20-30 gallons capacity

sides of their bodies. Every time the Lion Fish retreated after an unsuccessful attack, normality returned to the Blue Fusilier shoal. The whole sequence of events was repeated time and again until, twenty minutes later, the Lion Fish gave up and swam away without having caught a single Blue Fusilier. In this particular instance, membership of a shoal most certainly paid rich dividends.

A further advantage that shoaling provides is that it makes the locating of food much more effective. If, for example, a single fish goes in search of food, it is limited by its own powers of detection. Although sight, smell, sound, electricity and pressure waves can all be brought into play, the sphere of influence surrounding a fish is, by definition, relatively restricted. However, multiply this a thousandfold and the efficiency of the various food-searching activities is greatly enhanced. Once a source of food is located, the message is quickly transmitted to the other members of the shoal in various ways, including the agitated behaviour of the fish responsible for finding the food.



Sand Smelts, *Atherina presbyter*, are silvery-bodied shoalers

When it comes to spawning, being a member of a large group is a tremendous advantage in that mates are easy to find. Many shoaling species even go a stage further and indulge in mass spawnings without individual pairings taking place. The mere fact that there are so many shoaling species around today is clear evidence of how successful the 'safety in numbers' approach to survival is.

I have already referred to the genetic component that allows shoalers to respond to the messages associated with this way of life. Neither genes nor the chemical 'shoaling' messages emitted in the form of pheromones can be detected with any degree of ease by means of direct observation. Fortunately, from the aquarist's point of view, there is another aspect to the language of shoaling which is easily detectable

if one knows what to look for. These signs or clues are associated with the need for each member of a shoal to see its fellow shoalers and recognise them as members of its own species. Therefore, it is not surprising to find that shoaling species have easy-to-see markings on their bodies and/or fins.

The two main types of markings are spots and lines usually presented in such a way that they appear to stand out particularly prominently. Often, spots on the fins appear in association with silvery, reflective scales on the body, as on the Mexican Tetra (*Astyanax mexicanus*). At other times, there are no spots but the body itself is covered in reflective scales. A good example of this is the Sand Smelt (*Atherina presbyter*).

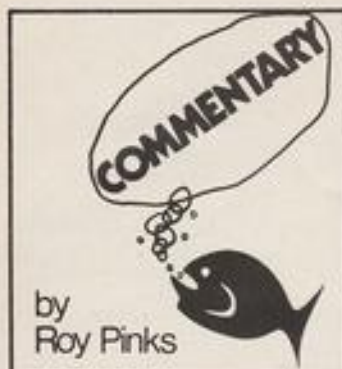
Where spots or lines appear, they can be made to stand out by bordering them with other lines or spots of a highly contrasting colour. For example, a 'loose' shoaler such as the Sleeper Goby (*Hypsoleotris* sp.) has two highly reflective horizontal bands bordering a dark-brown 'shoaling' line. Scissortails (*Rasbora trilineata*), on the other hand, have bright yellowish spots on either side of the black spots which they display on their caudal fins. In addition, they open and close their caudal fins in scissor-like fashion (hence their common name) making the spots appear to switch on and off in a most effective manner.



Astyanax fasciatus mexicanus exhibits both a distinct black spot and silvery sides

Some very interesting examples showing how important shoaling signals are, occur among mouthbrooding cichlids, such as *Oreochromis niloticus*. In the adult state, this species does not shoal. Not surprisingly, adults do not carry any prominent shoaling signals. The fry, however, shoal, particularly during the earliest stages. This, of course, carries tremendous survival value since it is essential for the fry to remain close to each other and to their mother for protection. The ever-watchful female, for her part, needs to be able to see her offspring clearly. The best way of doing this is, obviously, by means of a shoaling signal. Very young *Oreochromis niloticus* carry precisely such a signal. It is a black spot on the dorsal fin which is gradually lost as the need for shoaling decreases and their independence from the female increases over the first few weeks of life.

Finally, returning to my earlier statements, if shoaling species are genetically programmed to respond appropriately and have evolved to survive in shoals, it seems more than a little harsh to force such fish to exist alone or in pairs in aquaria among species they normally do not meet in the wild. In any case, Neons, Cardinals, Zebras and many Rasboras look more attractive, relaxed and colourful when kept in respectable numbers. Shouldn't we, therefore, respond to the language of nature by keeping these fish as they should be kept—in shoals?



I was very glad to see the appearance of Nick Lushchan's column, 'HELPING HAND'. Making things easier for handicapped people is one of those good habits which society is gradually accepting as standard practice, though there are compelling reasons why improvements in certain situations may be impossible to achieve in the short term. However, even in these particular circumstances, local goodwill to overcome the obstacles on a temporary basis may make all the difference. The essential factor is to make it clear from the beginning that handicapped people are welcome and not merely tolerated.

It should be remembered that handicap may be permanent or temporary. In the first case a friendly and helpful welcome will make life worth living, and in the latter it may well enable the patient to return to normality far sooner than otherwise. Most handicapped people try not to advertise their difficulties, but some cannot but do so. If facilities for wheelchairs, for example, are provided, it enables all concerned to do business without fuss or embarrassment.

But no charter for handicapped people will ever get off the ground unless there are people locally who are prepared to do some thinking and to take some action to get work done. A framework which might carry the necessary communications and action points might be constructed by 'HELP-

ING HAND,' showing, amongst other things, the sort of facility required at each aquatic retailer's—the shorter the list, the better. Some traders might well pick up the thread from there, and this is also the point at which the clubs, societies and independent helpers are given the chance to urge appropriate action locally, and to report back. I have already contacted a few local retailers, and at least three have indicated that they can help. If such information is made available to the societies and to the secretaries of local handicapped people's organisations, those interested could either make their own arrangements for visits or join organised parties.

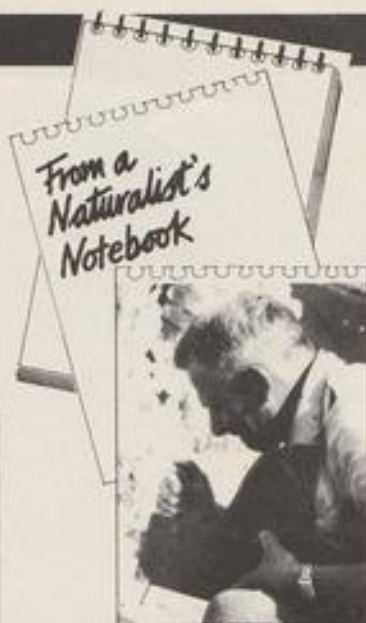
Providing facilities for the handicapped may cost a little money and effort, but as most work of this kind is tax-deductible, it is little skin off the nose. Nick has made it clear already that lack of facilities for the handicapped denies the trade a so far unknown layer of business, and there is no doubt that those who are enterprising and/or willing enough to take the matter seriously are likely to benefit significantly enough to make it all worthwhile.

The personal side must not be overlooked or discounted. The infuriating circumstances of his own visit to an establishment with which he had made prior arrangements illustrates very clearly that every detail must be thought through carefully at all levels in each firm, from management to the most junior operative. It makes complete nonsense of the whole thing if the boss extends a warm welcome over the telephone and casually mentions it to one of the managers, who promptly forgets it. If this happens to be on the day on which the boss takes his well earned half day, and on which one of the specialist clubs is bringing a mini bus full of members, it is small wonder that the Youth Opportunities youngster at the counter asks what the hell is going on, in a stage whisper, when half a dozen wheelchair patients turn up, too. It is no use saying that that's life: it certainly need not be: it is plain bad management and plain bad manners, and it can all be got around.

If you have ever wandered into a large aquatic centre on a Tuesday morning and wondered where and how the profits are made, you are getting warmer. Every establishment has its 'dead' periods, during which hardly a customer turns up and the staff become bored stiff after they have done all those unnecessary and time consuming jobs which help to make the day go. If sales records and staff opinions are co-ordinated with other factors like scheduled absences and club visits, deliveries from firms, etc., a pattern will emerge during which the firm's full resources and attention can be devoted to the more severely handicapped customers who may well, if the atmosphere is right, make something of a habit of repeating such visits. It is most important that junior staff are given proper briefing and training in patience and good manners: this can be quite basic, and need not take very long but, armed with it they are much more likely to make these visits enjoyable for all concerned than if they had had to do all the working out for themselves.

I think that the clubs, too, would benefit from any positive steps taken to help the handicapped do their fish-keeping. Many of these people, believing that they are something of a nuisance, may be very reluctant to attend club evenings at which, in all probability, there are minimal facilities for them in any case. This in itself may make the clubs more conscious of the benefits of their company, hence they may be able to fill in the missing bits. There are past members of many clubs who resigned because they got fed up with table shows and car treasure hunts, but who would have been more than happy to stay around if there had been handicapped members to talk to. Most club members are helpful and knowledgeable, and would enjoy passing on their experiences or sharing them with handicapped members who usually have a trick or two of their own to contribute.

I look forward to reading of steady and concrete progress in 'HELPING HAND,' and wish all power to Nick's elbow.



by Eric Hardy

It is not surprising that large-mouthed bass learn to avoid feeding upon distasteful toad-tadpoles. The surprise is that it took two US scientists and their expensive research at East Illinois University to tell us what we already knew. Any angler soon learns that fish can learn, when they become hook-shy in over-fished waters.

More interesting is the work of two Dutch herpetologists, Videler and Jorna, at Groningen University, on the sliding pelvis of the African spur-toed frog, South Illinois University research on the skin-poisons of the American Lewis' furrowed salamander, and among less publicised news from Zimbabwe, breeding the Gaboon viper in captivity. By the way, tadpoles of the spur-toed frog are peculiar in developing fish-like barbels from the corner of the mouth to feel the bottom of the rivers where the frog spends its entire life. Colwyn Bay Zoo the other year achieved the first captive breeding of the South American marine toad *Bufo marinus*.

After the unusual sight of a Prairie rattlesnake drinking water, two Americans thought up a bright idea of painting the rattle of rattlesnakes to identify them afield. Rattlesnakes have an alarm-scent in their cloacal sacs. Others devised a sturdy, light-weight noose-tube as a portable snake-restraining apparatus. Then there's the use of Tramisol in worming tortoises. A fascinating study is the role of the parietal or third eye in the back of a *Sceloporus* lizard's skull for sun-

compass orientation when it homes.

Some fish share with lizards this parapineal body. In pike, for instance, it probably records sunshine and is an indicator of day-length. In this fish it has cone-like photoreceptors and a number of nerve cells. Lamprey and rainbow-trout are other examples.

Anglers never exaggerate more than 25%. Far from being the heaviest Northwest record as widely acclaimed, a tasty 14 lb. turbot caught of Southport this summer had been equalled at Abberffraw and Menai, exceeded by a 15-pounder caught on herring-bait at Hilbre, 1960, a 22-pounder in the Dee, and a real bragging fish of 85 lb. trawled off Pwllheli! Length is a better criterion than weight in these voracious nocturnal predators on other fish. They normally spawn in more rocky water in the English Channel, but scientific opinion on their Northwest status is unscientifically contradictory. The late Prof J. Johnstone, in charge of

the old Lancashire Sea Fisheries Lab at Liverpool University, stated in *The Fauna of Cheshire* that the turbot "inhabits deep water at almost all stages of its life history." Our most experienced man on marine fish, the late Dr Travis Jenkins, D.Sc., Ph.D. former Superintendent of Lancs & Western Sea-Fisheries Committee, called it "a shallow-water species" in his classic *Fishes of the British Isles*.

Young turbot grow up in coastal waters and the recent 14-pounder's haunt was shallow enough. While turbot evolved a flat, one-sided camouflage to catch unwary prey on the bottom, cod evolved a sensitive barbel for the same result. The marine aquarist who stocks a seaside rock-pool for his outdoor aquarium has been interested by the modern rearing of turbot in aquaria at Lowestoft, though with less success than plaice. Small turbot, about 2½ ins, taken from the beach, fed voraciously on waste fish in tanks at 65°F, and grew to 12 ins in a year. Experimental rearing at Ardtoe in Argyll interested fish-farmers. Others were raised over five years in industrial power-station effluent from Hunterston Power Station, Ayrshire, despite chlorine used to prevent mussel-settlement. In their tanks, the turbot are fed twice daily on mashed, chopped or whole sand-eels and sprats. For the first seven months they were indoors and afterwards in covered outdoor tanks. In the second winter, water-heaters were turned down below 62°F and in the third, below 55°F.



SPOTLIGHT

THE BLUE TETRA

IN recent years an attractive tetra has been imported at irregular intervals and referred to, especially by long-standing members of the hobby, as *Mimagoniates barberi*. As has so often been the case in the past, it is a case of mistaken identity, the fish in question actually being *Mimagoniates microlepis*. Having said that, it should immediately be pointed out that both names are no longer correct. They have been replaced by *Coelurichthys tenuis* and *Coelurichthys microlepis*, while *Mimagoniates barberi* as described by Dr. Jacques Géry ("Characoids of the World," page 362) has obviously never been imported to date.

Both species are closely related to *Glandulocauda inequalis*, a species which is very rarely available. This fish is found in the Rio Grande do Sul region of Uruguay and it is not certain that this is the correct name for it. The two *Coelurichthys* species come from South-East Brazil. At a maximum length of 4.5 cm *barberi* remains smaller than *microlepis* which grows to 6 or 7 cm. *Coelurichthys tenuis* first appeared in Europe in 1907, in the possession of Oskar Kittler in Hamburg, but it did not survive very long. Then in 1912 it was brought back from Paranaguá by the ship's engineer, Albert Mayer. He first caught them in a rather fast-flowing stream, but subsequently almost all the fish were netted in the water courses and small rivers which flow into the Bay of Paranaguá and later fish were also collected in Francisco do Sul area—in the Rio Francisco (or Bopitanga), in

(*Coelurichthys microlepis*) by Peer Koppenaer

Photograph by Arend van den Nieuwenhuizen

the Rio Araguay and in the Rio Cachoeira. It is impossible to establish anything definite about the origin of the fish which were imported once more in large numbers, during the 20s, by Eimeke of Hamburg and Ramsperger of Bremen. With regard to the location of typical specimens of the species given as "Paraguay: Arroyo Yaca" by Dr. Barbero, one may well ask with justification whether the Arroyo Yacy which flows from the Sierra de la Victoria is being referred to and which, still on Argentinian territory (in the Misiones region), flows into the Parana. Such is the view of Arthur Rachow in "Aquarium Fishes in Words and Pictures" by Holly, Meinken and Rachow. The location of *Mimagoniates barberi* (so-called by the collector Dr. A. Barbero), is then given as South Brazil, Paraguay and the neighbouring area of Argentina, while *Mimagoniates microlepis* (which was described as early as 1876) lives from Rio de Janeiro as far as the Rio Itapocu in clear streams and rivers.

It is surprising that, in the past and at the present time, the species have often been confused as both descriptions of their coloration and well-known photographs enable the fish to be clearly distinguished. In the "DATZ" magazine of October 1971, for example, there appeared a picture of *Mimagoniates barberi* which obviously agreed with that of Harald Schultz on page 357 of the book by

Géry. When I saw fish on offer at the Royal Discus Centre in Witten Stockum under the name *Mimagoniates barberi* they did not appear to me to agree with the pictures. At home I housed the fish in an aquarium measuring 60 x 35 x 35 cm and after 24 hours the fish had taken on quite an attractive coloration. When I compared them with the photographs again I came to the conclusion that the fish I had bought had to be another species and the coloration described by Rachow then put me on the right track, as was confirmed by a photograph by Axelrod on page 360 of Géry's book which resembled my fish. It thus transpired that the species had been confused and my fish were *Coelurichthys microlepis*. On the very same page just mentioned there is another (poor) photograph by Axelrod from which one can nevertheless see how easily *Glandulocauda inequalis* and *Coelurichthys microlepis* can be confused.

Coelurichthys tenuis is more sensitive than *Coelurichthys microlepis*. It is well-known from very old descriptions of the former species that it often does not survive, in spite of appearing to be in good condition, and that a varied diet and an aquarium in a sunny location help to keep the fish healthy. The last two points apply also to *Coelurichthys microlepis*, as I can confirm from my own experience, although the species is definitely not as sensitive. It shows its most beautiful, blue, iridescent coloration in an aquarium illuminated by morning sunlight and containing water having 3 to 5°

SPOTLIGHT

DH and a pH reading of 6.6 to 7.0.

It is very important that the fish are not kept in water at too high a temperature. Although my fish were swimming about at the dealer's in a tank with a high temperature, I gradually got them accustomed to a temperature of about 23°C. I did so because it is well-known from literature on the subject that the most suitable temperature range lies between about 20 to 25°C, as is also the case for *C. tenuis* and *Glandulocauda inequalis*.

Specimens of *Coelurichthys microlepis* are very active fish and like an open space where they can swim freely in the midst of marginal vegetation. Given such conditions they will keep themselves active in the middle and upper water layers. As I have already mentioned *C. microlepis* is not as sensitive as *C. tenuis* and if one follows the advice given above and feeds them water fleas, Cyclops and white and black mosquito larvae, then there is very little which can go wrong. I did find that the fish were unenthusiastic about *Tubifex*, but fed very well on deep-frozen krill. The fish display their lively behaviour to the best effect if they are kept in a small shoal and also in the company of other, peaceful inmates which have the same temperature needs. It is not advisable to keep the fish with other species which are very active in the same water layer as this merely results in giving the aquarium an unsettled effect.

Pairing behaviour can develop quite spontaneously. The fish chase and drive each other at an improbable speed and one can only marvel at the "acrobatics" they display. In the midst of all this activity spawning takes place which lasts only a short time and during which the male wraps himself

completely around the female. Fertilisation occurs internally, whereby the capsule of milt extruded by the male is deposited in the oviduct of the female. This is made possible by the fact that during pairing male and female position themselves with their bodies pressed close together and the uro-genital openings of both fish are placed one against the other. The female usually lays the eggs on the following day. In the community tank they simply disappear. If one wants to breed the fish the male and female fish are kept apart for about 14 days and they are "filled to the gills" with food. Afterwards the fish can be put together in a breeding tank. After pairing the females are put individually in small breeding tanks. Here they will spawn on the plants which should be provided. For this purpose both fine-leaved plants and ones with larger leaves are acceptable. The adhesiveness of the eggs varies. They do not all adhere to the plants and some fall to the tank bottom. Fish which are not in the best condition as far as feeding is concerned will consume the eggs. It is advisable, therefore, to remove the females from their spawning tanks as soon as they have "emptied" themselves.

At an average temperature of 25°C the tiny crystal-clear young hatch out after about 42 hours. It is a good idea, too, to remove a few eggs from the breeding tank with the aid of a pipette just after they have been deposited. These can then be placed in a small rearing dish positioned inside the breeding tank. In this way a magnifying glass can be employed to ascertain when the yolk-sac has been consumed and feeding with pond *infusoria* should be started. If no *infusoria* such as rotifers, Cyclops nauplii and so on are available then one should try *finest* brine-shrimp nauplii, checking carefully whether they are consumed or not. If one has only the nauplii of a larger species

of brine-shrimp available then one must expect to lose a considerable proportion of the brood. This situation can be avoided by rearing a supply of slipper animalcules at just the right time, so that plenty of suitable food for the young is ready and waiting.

While rearing the fish, particular attention should be given to ensuring that the water quality is good. The best course is to reduce the water level in the breeding tank after spawning to a few centimetres and then, after the young are free-swimming, to raise it daily by putting in water of the same composition and temperature. Ideally, another tank is set aside in which the water to be added is left to stand and aerated for a few days. Breeding will be most successful if soft water with a slightly acid pH reading is used. Later one must be very careful in transferring the young. They are very sensitive to a change in water hardness which does not take place gradually and one must accustom them slowly to water which is harder, therefore. The best method is to use a holding tank. The young should be placed in it four weeks after they are free-swimming. Before the fish are introduced a water level of about 10 cm is created using water from the rearing tank. Subsequently, the water level can be raised daily by a 10% increase in the volume of water, using hard water as an additive. In this way no risks are taken, provided one ensures that a constant temperature is maintained.

According to various accounts the productivity of this species is variable. Without doubt this depends to some extent on the food offered to the fish. The diet for the young fish should be as varied as possible and as soon as possible after the pond infusoria stage they should be given freshly hatched brine-shrimp nauplii, Micro and very soon after small water fleas and so on. On this kind of fare they will grow into healthy adult specimens.



Killer disease thrives on cleanliness

"CLEANLINESS is next to Godliness"; or so I have often repeated within the Coldwater Jottings column. I have also often mentioned how I prefer to keep my coldwater fish in completely bare tanks or ponds, having no plants or gravel, and how this helps me to maintain water quality and keep the aquatic environment free of disease.

However, I have to bring to the attention of all coldwater fishkeepers the outbreak this year of a disease which prefers nothing better than the pristine conditions of which the serious aquatic hobbyist is so proud. Indeed, 'dirty' conditions—showing a high algae content, for instance—seem to hold the disease back!

If you are unfortunate enough for your fish to be affected by the disease there is, I am sorry to say, little that can be done except to destroy the fish. I have had several telephone calls from fishkeepers describing its symptoms, which occur quite suddenly in apparently otherwise healthy fish. These would become covered completely with a thick whitish slime, mainly around the gill areas. The fish will appear sluggish and remain motionless at the bottom of the tank or pond.

Eventually the slime becomes so thick around the gills that all the gill filaments become completely clogged and are destroyed thus, of course, killing the fish.

This condition, I regret to report, affected some of my own best quality Moores early this past season while they were undergoing conditioning for spawning in separate tanks.

As always after an outbreak of any trouble, the tanks were emptied completely and allowed to dry thoroughly in sunshine to sterilise them. Unfor-

tunately, I have since learned that sunshine does not seem to cause any harm to the virus, so I shall have to take more drastic precautions to sterilise my tanks before I use them again.

I have had several reports over recent months concerning the outbreak of this disease among goldfish in garden ponds, as well as in koi and certain river fish. Although it would appear that the condition is not at present widespread it has understandably caused some alarm among those of us who have an especially keen interest in the hobby.

Hope

As we are all aware, there have been several 'scare' related to unidentified diseases in the past, and there is hope that this one, too, will become just another page in the reference books.

The most likely condition which has the foregoing effect on fish is known as Branchiomycosis—a localised fungal infection which affects carp, including goldfish and koi, tench, stickleback and pike. It would appear that orfe, roach and dace may not be affected by the disease.

The main characteristics of Branchiomycosis are as follows:

- (i) Total loss of gill filaments;
- (ii) Eyes discoloured;
- (iii) White coagulated body slime;
- (iv) Death occurs in two to three days;
- (v) The more oxygen given the more active the virus becomes;
- (vi) It is capable of attacking other fish, and with it needing a high content it is more prevalent in the gills.

Secondary symptoms are:

- (i) Fin rot;
- (ii) Haemorrhaging on main drive muscles and socket muscles of pectoral fins, main ray of dorsal fin, and caudal, anal and pelvic fins;
- (iii) Severe haemorrhaging of the heart area in the 'V' between where the gills end and the pectoral fins begin;
- (iv) The fish appear drunk as though suffering from carbon-dioxide poisoning.

Treatments

The following treatments have been found effective in the very early stages (ie: the fish appear healthy but may be suspected, or at risk, of contracting the disease):

- (i) Benzocaine Chloride 1 per cent solution. Thirty-minute dip four times per day;
- (ii) A bath of Chloramine 'T'—as used in the USA to sterilise dairy machinery;
- (iii) Hospital treatment using a 'cocktail' of 100 per cent American Furinace Oxytet (not horticultural grade) with Methylene Blue. Pre-heat the bath to a temperature of 72 degrees and apply high aeration. Immerse the fish in the treatment bath and the virus will be stopped in 70 seconds. Over a seven-day convalescence slowly reduce temperatures to normal. (NB: This will also kill off the bacterial colony in undergravel filter so I would advise a completely bare hospital tank.)

Research

The first person to conduct serious research on Branchiomycosis is believed to be Margaret Plehn in Munich in 1912, following a serious outbreak the previous year.

The next major outbreak occurred on the Continent in 1929; and a vast outbreak, again on the Continent in 1971, is believed to have destroyed 22 million fish.

Further scientific research is currently being conducted in Britain to determine exactly the cause and effect of this latest outbreak. Not being of a scientific mind myself I can best leave that to the experts. However, in order to monitor the spread of the disease in the country I am embarking upon a nationwide survey.

If you suspect that your fish have, or have had, these symptoms and feel fairly sure that they match the foregoing descriptions, I would appreciate it if you would let me know as soon as possible, by contacting me c/o 'Aquarist and Pondkeeper'.

Your questions answered...

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Every query receives a personal answer and, in addition, we will publish a selection of the most interesting questions and responses each month. Please indicate clearly on the top left hand corner of your envelope which department you wish your query to go to. All letters must be accompanied by a S.A.E. and addressed to:
**Your Questions Answered, The Aquarist & Pondkeeper,
The Butts, Brentford, Middlesex TW8 8BN.**

TROPICAL



Dr. David Ford

Tropical



keeping tropical aquatic frogs...

I have what were described to me as tropical aquatic frogs that grow to 1½ in. in length. Can you give me any information as to feeding, breeding etc, or any books I might read?

There are many frogs and toads (collectively called *anurans*) available to the herpetile hobbyist. The family that can be called "tropical aquatic" is Pipidae. This family includes the tiny *Hymenochirus curtipes* or dwarf water frogs. Much larger is *Xenopus laevis*, used in medical laboratories for pregnancy testing.

These aquatic frogs are clawed and tongueless. They do not leave the water at all, so could be housed in a normal (tropical) aquarium. They swim to the surface for air and crawl over the bottom looking for food.

Feed on worms, scraped lean meat, fish scraps, flake food. They can be hand-fed and will breed in the aquarium—the eggs must be isolated or the tiny tadpoles that hatch within a week, are eaten. Feed the tadpoles on fry food.

The frogs can be mixed with tropical fish, providing the community does not include large aggressive species (who would attempt to drive the frogs away) or very small fish, which the frogs may eat.

If you want to learn more about Herpetiles, read "Encyclopedia of Reptiles and Amphibians" by J. F. Breen, TFH Publication 1974, ISBN-0-8766-220-3.

keeping and breeding angels...

I have a freshwater community tank with Neon Tetras, Glow-lights, Butterfly fish and Ghost fish, etc. The tank is 27 in. x 12 in. x 14 in. high. I have three Angel fish in this tank (two black and one silver). Please can you give me some hints on keeping and breeding them. Can you cross-breed them?

The two kinds of Angel fish you own are just varieties of the one species *Pterophyllum scalare*, so they will breed. Of course, you will get the equivalent of 'mongrels' because you are cross breeding two distinct varieties.

Angel fish prefer soft, slightly acid water and tall plants to swim around. It is very difficult to sex the fish; better to let them pair naturally and isolate them in a separate breeding tank. Use newly hatched brine shrimp when the eggs hatch and thereafter crushed flake food.

D.F.

Coldwater



I have a tank of goldfish and an aerator is in use. I keep it on during the daytime but turn it off at night. Is this correct?

If you must use an aerator then it is much better to use it during the hours of darkness than during daylight. Providing the tank is adequately planted the water should keep in good condition during the daylight hours when the plants are giving off oxygen. At night the plants cease to do this but give off carbon dioxide.

Also during daylight the fishes are active and so cause a certain disturbance of the surface, thus assisting the absorption of oxygen. As a small boy I was told by an experienced aquarist that to use an aerator in a goldfish tank was a sign of bad management, either the tank was over stocked with fishes or they were being over-fed.

breeding orfe...

I have seven Orfe in my pond up to eight inches long. They are healthy but have never bred. I have goldfish in the pond which breed regularly. How can I encourage them to breed?

You did not state the size of your pond nor the number and sizes of the other fishes in it. If the fishes are over-crowded it may be the reason why the Orfe have not bred. These fishes must have plenty of swimming space and well oxygenated water. The Orfe are usually about nine inches long at least before they breed and so yours may do so in the near future. All you can do to encourage them to spawn is to see that they have plenty of space and that they have a plentiful supply of oxygen in the water during April and May. In late May if they have not spawned, empty most of the water and refill with fresh. Do this during an evening and this will give the Orfe the right conditions in which to breed. They prefer to spread their eggs on the fine roots of plants such as come through the plant containers in the pond or pond-side. The eggs are adhesive, similar to those of goldfish but are very slightly larger. The raising of the fry is as for those of goldfish.

A.B.

COLDWATER

Arthur Boarder

PLANTS

Vivian De Thabrew

KOI

Hilda Allen

MARINE

Graham Cox

DISCUS

Eberhard Schulze

Plants**amazons...**

I would like some information on the best way to grow plants in the aquarium. My tank is 44 in. x 15 in. x 12 in. The gravel is about 4 in. deep. I am using an under-gravel filter at the present, but I hope to change to an external one very soon. There are only two types of plants in the tank, Amazon Sword and *Anubias nana*. The light is on seven hours per day and is a Gro-lux. The pH is around 7.4. When I put in the Sword plants they last only a few days.

Changing your filter to an outside one should not harm your plants. What does need further attention is the conditions you are giving your plants. *Anubias nana* comes from Africa and is essentially a marsh plant, although it will tolerate underwater conditions for some time, but will grow very slowly. Amazon Sword, which comes from South America originally, requires good light, as indeed does *Anubias*. Therefore your lighting (40 watt) should be on for 8 to 10 hours per day. A pH of 7.4 suggests your water is much too alkaline for both species, and probably too hard also. Amazon Sword requires medium hard water of a neutral condition, pH 6.9-7.0, while *Anubias* requires soft, slightly acid water. As a compromise, try to bring your pH down to at least 7.0, preferably a bit lower.

This can be accomplished by incorporating some peat into your gravel, say 1/2 in. layer between two 1 1/2 in. layers of gravel. This will also give your plants more nourishment, for

both *Anubias* and Amazon Sword need a lot of nutrition. Ideally your planting medium should have its nutrients replenished by the addition of clay granules or sun-dried clay balls to the base of the roots of your plants. Another way of softening your water would be by filtering it through peat. This you could do by using your outside filter with peat placed inside the filter chamber. Filtered rainwater is also ideal for most aquarium plants.



Amazon swords dislike alkaline water

As you can see, *Anubias* and Amazon Sword are not wholly compatible, as *Anubias* requires softer, more acid water than Amazon Sword, so you will have to compromise if you are to grow the two species in the same tank. Both plants require a temperature of about 77°F. Please experiment with these suggestions and let me know how you get on.

V.T.

Koi**bottom drains...**

The rectangular pond I am making should hold about 3,500 gallons and will vary in depth from 3 feet to 4 feet end to end. After seeing various ponds I am still puzzled where to put the bottom drain to

be certain of taking out the settlement of sludge, etc., that builds up somewhere or other in most of the ponds I have seen.

There is no certain answer to your query as much depends on the disturbance created by a water return.

In your case, and although the pond floor has a moderate slope to one end, it is doubtful if the main settlement will be in that area. On the other hand, polluted water will collect there, as will your Koi during the colder months, and at least one bottom drain at the deepest part is particularly useful to remove most of the waste products.

If the return is arranged to provide a generally circular motion to the water, I would suggest a second bottom drain be located more or less in the middle of the floor but slightly towards the less disturbed area of the shallow end.

Despite a sloping floor, even much more than yours, settlement rarely occurs where it should according to theory, and I do not know of any that has completely solved the problem of removing all waste matter.

In order to maintain reasonably clean and healthy water conditions for Koi, you should be prepared to clean the floor of your pond quite regularly either by a siphon pipe or by a suitable pump having an impeller that will not be choked by algae or other debris.

If my ideas seem fanciful to some, it is a fact that most Koi-keepers prefer reasonably clean ponds in which they can see their fish, and the pond to be an attractive feature of the garden. Mildly green water is acceptable and indeed healthy for Koi, but even this calls for attention when large fish are confined within the limitations of most garden ponds.

H.A.

Marine

the question of compatibility...



1. Is it all right to mix different brands of sea salts together?
2. How do I cure corals, sea-fans and shells before putting them into my new marine aquarium?
3. Can I keep clownfishes without anemones?
4. Can anemones be kept with damselfishes, surgeons, angels, butterflyfishes, triggers, etc?
5. Can Boxing Shrimps be safely kept with triggerfishes?
6. I plan to use U/G filtration with the lift-pipes operated by a motorised rotary water-pump. Is this sufficient?
7. What is the average life-span of coralfishes?
8. Which is the easiest butterfly to keep?
9. Is the Powderblue Surgeonfish easy to keep?
10. What sort of food does the Spanish Hogfish eat? I plan to keep one of these as a 'first fish.'
11. What sort of livefoods are available for coralfishes?
12. Can I feed mussels purchased from the local fishmonger?
13. What are the easiest clownfishes to keep?
14. Can you give me any details of the Firefish?
15. What are the differences between surgeonfishes and tangs?
 1. Mixing different sea-salts—it is perfectly permissible to mix any two or more synthetic seawaters together.
 2. Curing corals, etc. Corals should be stood in a plastic bucket containing one cupful of 'Brobart'-type liquid bleach per bucketful of tap-water. They should be kept in this solution (—with occasional stirring) for at least 72 hours. After this time has elapsed, pour the bleach solution away and stand the bucket full of corals under a running tap for two hours to thoroughly wash them off.

Shells should be given the same treatment as above, but only after they have been boiled for one hour to dislodge all traces of mollusc flesh from the inside of the shell.

Sea-fans are potentially very difficult to cure. I have on occasion given selected sea-fans the full curative treatment above—including boiling—only to find that they were still capable of fouling the aquarium water. The only safe way to proceed with sea-fans is to cure them fully as above and then stand them in a bucketful of fresh seawater. Leave them in this solution for a week and see if the seawater becomes foul, i.e. does it have a foetid odour? Do stable gas bubbles remain on the surface if the seawater is agitated? Is the seawater discoloured? If the answers to any of the above questions is "YES", you must then discard this fouled seawater and repeat the process until clear, fresh-smelling, colourless seawater remains after seven days of immersion.

3. **Clownfishes v. anemones** — whilst it is true that certain species of *Amphiprion*, e.g. the Teak Clown (*A. melanopus*), the Fire Clown (*A. ephippium*) and the Maroon Clown (*Premanus biaculeatus*) can be successfully cultured in a home aquarium which does not contain an anemone of the appropriate species, whether or not such a decision on the aquarist's part is cruel or not is down to the individual aquarist's conscience. I personally believe that such an action is cruel if prolonged for more than the 7-10 days medication period required to quarantine successfully newly acquired clownfishes.



Clownfish should always have an anemone

4. **Anemones v. showfishes** — anemones are an interesting addition to any tank containing any collection of showfishes **except** for members of the *Chaetodon* genus of butterflyfishes.

Chelmons and forcipigers, i.e. Copperband and Yellow Longnose Butterflies respectively, will normally leave most species of anemone alone, but do not buy a member of the genus *Chaetodon* if you expect to keep an anemone alive.

Please also remember that with a 48 in. x 12 in. x 24 in. tank, (i.e. 2 feet deep vertically), you will need at least four 48 in. fluorescent tubes, one 'Gro-lux' and three 'Northlight', in order to 'punch' enough light down through this depth of water to prevent the anemone from slowly deteriorating due to the deaths of the symbiotic algae.

5. **Boxing shrimps v. Triggerfishes**—not advisable.

6. **U/G filtration**—you will need a motorised water-pump for each air-lift unless you operate the air-lifts with air from an air pump.

7. **Life-spans** Damselfish/Clowns—4-5 years. Angels, Butterflies, Surgeons/Tangs, Wrasse, Batfish, Groupers, etc.—5 to 15 years. The above figures of course assume superlative water management and animal husbandry techniques throughout.

8. **Hardest Butterflyfish**—*Chaetodon kleinii* (The Sunburst Butterfly).

9. **Powderblue Surgeonfish**. This fish is quite easy to keep provided that you have a large tank (48 in. minimum) with plenty of swimming space and regularly meet the surgeon/tang group's requirement of plenty of vegetable matter in the diet. Suitable foods here are spinach (—fresh or frozen), green lettuce leaves and green flake-foods.

10. **Spanish Hogfish**. In the first place I would strongly advise you against purchasing any marine showfishes i.e. any fish other than damselfish for at least 2-3 months after establishing the tank. If you are not an instinctively good, well-read aquarist but instead have to learn everything the hard way, I would advise you to restrict your purchases to 2-3 damselfishes for 5-6 months even.

However, once you have learnt the basic skills of marine aquarium management in whatever length of time, a Spanish Hogfish should present no great difficulties for you. They are like most of the wrasse family in that they are predominantly carnivorous although they will take vegetable foods

from time to time. They are very fond of *Mysis*, lancefish, cockle, shellmeat, shrimps, etc., all of which must be gamma-ray irradiated to make them safe to eat.

11. The only livefoods which I know of which are safe for corallifishes are earthworms, whiteworms and brine-shrimps.

12. **Mussels from fishmonger.** NO! The North Atlantic System pathogens and parasites with which these local seafoods are infected must first be destroyed by gamma irradiation.

13. **Hardy clownfishes**—see those species listed under Answer 3 above.

14. **Firefish** (*P. splendidum*)—a relatively hardy little fish which should really be kept in groups of 2-3 minimum.



Acanthurus leucosternon the Powderblue Surgeon

15. **Surgeonfishes and Tangs** are all members of the same Acanthurid family of fishes. Many people seem to regard the two names as being interchangeable. Personally, I prefer to reserve the name Tang for that group of Acanthurids in which the body outline is more or less circular, i.e. *Zebraoma* species and use the term surgeonfish to describe those members of the family which have relatively elongated bodies, e.g. *Acanthurus lineatus* (Pyjama Surgeon), *Acanthurus leucosternon* (Powder Blue Surgeon), etc.

G.C.

Discus

introduction to discus...

I would be grateful if you could answer some of my questions on 'discus'.

My tank measures 18" x 12" x 12", it is well aerated and I am using a box filter.



I have recently purchased two small discus the variety of which I am not sure. They have grey stripes on their body and a black stripe from the top of their head to the bottom, passing the eye.

I wonder if you could tell me how I can make my tank have the correct environment for the discus to grow and possibly breed. I should also like to know about feeding and what I should do if livefood is not available, i.e. what other food can I give them?

I am thinking of purchasing a few more baby discus but as they are rather expensive I would like your advice on this matter as discus are new fish to me. I also have a 3 ft tank in which I keep a variety of tropical fish and I am somewhat aware of their diseases, do discus have similar diseases and if not, could you give me some advice on their diseases?

Many a hobbyist became a 'discus-fish-fanatic' after having seen some of these fish in either a dealer's tank or at some friend's house. What attracts most people to these fish apart from their overall beauty, colour, shape and form is also their sheer size. These fish will grow, in a good size tank, to something like 6 inches and must therefore have a certain amount of room. Your tank is certainly much too small. The smallest size aquarium should never really be much smaller than 36" x 18" x 18".

Discus are no longer considered to be as difficult as they were even only 10 years ago; they just have to have some special needs provided and these are: a good size tank, a power filter, a 'reasonable' quality water, an electronic thermostat and, of course, good fish to start with.

A large size aquarium will not only give the fish plenty of room to develop properly but the water will also not foul-up so quickly. A power filter is the only one to be used. One has the choice of either using peat, charcoal or any biological materials as media and will also give you the necessary turnover of the water. With a power filter the water can also be returned via a overhead trickle filter. These

units have appeared on the market in the last few years but were used in many of the discus tanks at 'The Highgate Aquarist' almost 10 years ago. Although most books will state that the water must be soft and acidic, they very often go no further than that. Discus are quite tolerant to any water as long as it is within a certain range. There is no need to go much softer than 3 degrees DH or much harder than 12 degrees DH. It is very easy to harden-up soft water, but if the tap water is harder than 12 degrees DH it can only really be softened with a softener water. If I had to choose the most important piece of equipment, although, it would be difficult, I suppose I would always go for a good thermostat. Most heater/thermostats work very well on any community aquarium where the temperature is never much more than about 75°F. Using the same heater/thermostat will very often result in the magnets sticking to one another after a short time and as most discus keepers are also over generous with their wattage, the water will just get warmer and warmer with the result of having boiled one's fish. Most discus are killed off like this and do not die of old age.

Feeding these fish is no longer a problem: there are many good quality frozen foods available; beef heart has for years been considered their staple diet and today many discus will even go for flake foods. Stay away from live foods; they are the 'lazy-man's' food and will often result in diseases being introduced.

The only disease one often finds with discus is either 'hole-in-the-head' disease or Spironucleus. There are, of course, other ailments one comes across but these are usually minor ones and can be cured very easily with either one of the available medicines or heat or a good water change.

Finally, let me say, most hobbyists who discover discus are often hooked for life and all the other tropical fish, as beautiful or interesting as some of them are, become second raters; but to become really hooked one must have success and one will only have real success when one follows the established route... and has a little bit of luck.

E.S.

Company Profile

The Chelsea Aquarist Ltd.



The Chelsea Aquarist's colourful and welcoming shop front in Chelsea Farmers Market

JUST off London's famous King's Road is a very interesting and colourful area known as the Chelsea Farmers Market. Within this 'market' there are several log cabins housing a pizzeria, cafeteria, plant nursery, a most unusual steam clock, craft and wine shops and The Chelsea Aquarist Ltd. (the subject of our Profile this month), all attractively arranged around a central patio with parasols, tables and chairs where you can enjoy a cappuccino and a cake in the open air.

The Chelsea Aquarist Ltd. is located almost directly opposite the main entrance to this welcome haven in Sydney Street.

One thing that strikes you forcibly as soon as you enter the shop is its cleanliness, always a good pointer to the sort of things you can expect inside. And there is indeed a great deal to admire inside. For a start, there are 58 tropical freshwater tanks (excluding 15 specially designed for African Rift Lake Cichlids). Then there are 17 coldwater tanks, a pond, 17 tropical marine tanks (5 dedicated to invertebrates) and 7 show tanks.

Among the last category are two large, magnificent exhibition corner

aquaria, one housing a luxuriant marine community and the other containing an equally spectacular freshwater one.

Both these tanks are run on the Dupla system, as are all the other Chelsea Aquarist aquaria. For example, the freshwater tropical section operates on a modified 850-gallon Dupla system, the African Rift Lake section on a 600-gallon system, the tropical marines (fish) on a similar one and the invertebrates on a separate 200-gallon system.

As would be expected, these tanks are absolutely spotless and the water crystal clear. Not surprisingly, the fish and plants are in sparkling condition.

Twice-monthly shipments of quarantined stock from the Continent, personally selected either by the Directors, Pascal Borg and Lee Demetrius or their Manager, Gary Stobart, help to ensure a regular and ever-changing selection of high-quality fish, invertebrates and plants (including seaweeds), many of which are only rarely seen elsewhere.

The Chelsea Aquarist is a Dupla Associate which means that the complete range of sophisticated filtration, lighting and water treatment equipment

manufactured by this West German Company is always available in the shop. In addition, the brand-new Dupla Exclusive Tank, which houses an aquarium and equipment in a self-contained unit, can be obtained from The Chelsea Aquarist. The Company also manufactures, and is the stockist for, a special version of this tank with plans already in hand to develop the system further.

More conventional aquaria are, of course, also available. Nowadays, 'conventional' is gradually beginning to include hexagonal aquaria as well as rectangular ones. At The Chelsea Aquarist these, and others, are attractively displayed in the centre of the main shop, in front of and below a large, fully furnished aquarium of Angels.

In fact, attractive displays are a hallmark of the Company, exemplifying its belief in the dual combination of good quality stock and its subsequent optimal presentation to the public. This stretches to a wide range of dry goods, books and plants, the last of these occupying an open, cascade-type unit consisting of interlinked, illuminated hexagonal tanks.

Up to quite recently, The Chelsea Aquarist was strictly a retail outfit. However, a wholesale department has now been added and the Directors would be very interested to receive enquiries from retailers, particularly (but not exclusively) those based in the south of the country.

The Chelsea Aquarist Ltd., Chelsea Farmers Market, Sydney Street, London SW3 6NR. Tel. 01-351 3617.



Chelsea Aquarist's impressive marine exhibition corner tank

★ ★ ★ ★ ★ ★

THE AQUARIST

Tomorrow's AQUARIST



Interested in a Gift? If so — read on...

TOMORROW'S Aquarist has now been appearing every month since June 1983. It has always been a varied package, including, among other things, competitions, articles, reports, snippets of information and, very importantly, regular contributions from T.A. readers. These contributions have taken many forms—readers' drawings, cartoons, photographs, articles and reports have all appeared on this page. We are, obviously, very pleased to publish submissions from our readers as often as possible, so please don't stop. Keep them coming.

Although we have been made fully aware (by our mailbag) that T.A. readers do not require any form of bribe (!) to get them to write in, we are delighted to announce that a number of manufacturers, wholesalers, suppliers and other members of the aquatic industry have agreed to donate some of their products to our "Tomorrow's Aquarist Fund".

Therefore, for the next few months at least (hopefully longer), any reader who has anything published in Tomorrow's Aquarist will receive 'a little something' from the T.A. Fund.

Now is your chance to write 'that' short article you've always said you would if you set your mind to it—or draw that fantastic picture you keep meaning to but always put off—or take those exclusive, one-off photos next time your fish spawn, or fight, or display, or anything. As long as you think something is interesting, we will be interested. Of course, we cannot promise to publish everything, but we will try our best.

Remember that, as we outlined in our very first T.A. feature way back in June 1983, "anybody who is enthusiastic, interested or committed enough to be willing to learn will

be a better aquarist tomorrow than (s)he is today". If you fall within this category, then you 'qualify' to be featured in 'Tomorrow's Aquarist'. What could be simpler?

This month's batch of goodies consists of tubs of Colour Food, Vegetable Diet and Tablet food kindly donated by 'Aquarian', along with a copy of each of the following:

'Aquarian' Advisory Service publications:

1. A Guide to the Care of Freshwater Tropical Fish.
2. A Guide to the Care of Coldwater Fish.
3. A Guide to the Care of Tropical Marine Fish.

Each of the following T.A. contributors will shortly be receiving their 'prizes' for their excellent submissions. Congratulations lads and thank you for your contributions.

1. Tiger Barb (*Barbus tetrazona*)—sent in by **Andrew Dodds** who won our Fun-Fish Competition in October 1984 with his 'Bad-is-Bad' entry.

2. Scissortail (*Rasbora trilineata*)—sent in by **Luke Mills** who was also one of our original Fun-Fish Competition winners (November 1984—'Peppered Catfish').

3. Lorrycarrier Filamentosa (*Loricaria filamentosa*) submitted by **Nicholas Yallop**.

★ ★ ★ ★ ★ ★ ★ ★



The Yorkshire Aquarist Festival

by John A. Dawes

OVER 12,000 people attended this year's Yorkshire Aquarist Festival held at Doncaster Racecourse on 10th and 11th August.

The organisers were, quite rightly, delighted with this figure which, coming on top of other improvements, helped to make the event one of the most successful ever.

As usual, there was a great deal to enjoy and admire everywhere.

For example, the tableaux were exceptionally good this year. The time, effort, ingenuity and sheer creative energy put into their conception and construction still astounds me—even after all these years. When this is coupled with excellent fish displayed in an 'integrated' fashion, the result is truly magnificent. On this point of 'integration', I must mention the tableau presented by the **Anabantoid Association of Great Britain** which, while not being 'spectacular', had a great deal to commend it. It was built of pipes joined expertly together in the shape of a Chocolate Gourami, the fish depicted in the A.A.G.B. motif. Not surprisingly, the overall

colour was chocolate brown. The supporting structures were cream coloured and the display tanks were shaped to fit the internal contours of the framework along the lateral line of the fish.

Although it did not win an award, this 'forward-looking' tableau showed just how great the dedication of the exhibitors is. Pride of place in the tableau went to **Bridlington A.S.** for their superb Windmill, followed, in order of merit, by other excellent efforts from **Bradford A.S. (Train)**, **Darwen A.S. (Fair)**, **Hobbies Centre Aquatic Group (Model Village)** and **Dunfermline A.S. (Cake)**.

In total, there were 25 entries in the tableaux section, all of commendable quality.

On the fish side, there were 617 entries, around 100 up on last year, with competition being as keen as ever. The overall winner of the coveted **Best Fish in Show** award was the biggest, most beautiful *Tilapia burtiniferi* I have ever seen, belonging to **Reg Payne of Merseyside A.S.**

In the elite **Fish of the Year** competition the winner was **Mr. & Mrs. B. Baldwin's (Sandgrounders A.S.)**, elegant *Polypterus ornatis*, a top-quality fish by any standards.

The **Best Exhibit** trophy went to **Mr. & Mrs. T. Groom of A.A.G.B.** for their *Malpulutta kretseri* Breeder's Team.

One of the regular features of Y.A.F. is a series of lectures/demonstrations given on the Saturday and

the Sunday. This year, the organisers decided to reduce the number almost by half. The Saturday programme consisted of a demonstration of tank construction presented by Frank Seal and one on furnishing an aquarium by Derek Jones. On the Sunday, I gave a lecture, accompanied by 120 colour slides, on 'The Language of Fishes', the subject of my current series of articles in the *Aquarist & Pondkeeper*.

Judging by the attendance, the organisers' decision was the right one. The Lonsdale Bar (a superior lecturing room to the Gainsborough Bar) was packed for all three presentations. I am certain that I speak for all three presenters in expressing sincere thanks to the Y.A.F. Committee for their tremendous assistance.

The trade also supported the Festival in considerable numbers and business was, without a doubt, brisk throughout the weekend. The range of fish, plants, dry goods and accessories was as wide as ever, perhaps wider since there was even a potter, Jerry Harper, making and selling his wares (and apparently doing very well). One of the most unusual aquatic products was a Paludarium, manufactured by L.M.B. Aquatics and exhibited for the first time ever at Y.A.F. In addition, all the big names in the trade and some not-so-big ones were there in force, lending strength to the fact that Y.A.F. is a great Show of the best in aquatics.

Tableaux: 1st, Bridlington (Windmill); 2nd, Bradford (Train); 3rd, Darwen (Fair); 4th, Hobbies Centre Aquatic Group (Model Village); 5th, Dunfermline (Cake).

Fish of the Year: 1st, Mr. & Mrs. B. Baldwin (Sandgrounders)—*Polypterus ornatis*; 2nd, E. Eyre (N.E.Y.—B.K.A.)—*Nothobranchius melanospilus*; 3rd, D. Barrett (B.B.C.—Thorne)—*Zoogeomys quitoensis*; 4th, C. Taylor (Wyke)—*Carassius auratus* (Veiltail); 5th, Mr. & Mrs. P. Moore (S.L.A.G.)—*Xenotoca melanostoma*.

Best Fish in Show: R. Payne (Merseyside)—*Tilapia burtiniferi*.

Best Exhibit in Show: Mr & Mrs. T. Groom (A.A.G.B.)—*Malpulutta kretseri* (Breeders' Team).

Highest Pointed Society: Dunfermline.

Highest Pointed Individuals: 1st, D. Penny & Becky (Doncaster & A.A.G.B.); 2nd, W. Renton (Dunfermline); 3rd, E. Eyre (Doncaster).

Individual Classes

Society Furnished Aquarium: Darwen.

Tropical Freshwater Furnished Aquarium: H. Hoey (Dunfermline).

Coldwater Furnished Aquarium: Mr. & Mrs. B. Walsh (Darwen).

Marine Furnished Aquarium: D. Penny & Becky (Doncaster).

Aquascape: D. T. Milner (Darwen).

Novelty: K. Lancashire (Doncaster).

Guppies: E. R. Walker (Merseyside).

Platies: Mr. & Mrs. P. Moore (S.L.A.G.).

Mollies: W. Renton (Dunfermline).

Swordtails: D. Barrett (S.L.A.G.).

A. V. Goodeid: R. Turnbull (S.M.T.A.S.).

A.O.V. Livebearer: Mr. & Mrs. Johnson (S.J.S.).

Small Barbs: V. & S. Parr (Oldham).



The Windmill which gained first prize for Bridlington A.S.



2nd prize went to Bradford A.S. for this magnificent model of a Train



The Model Fair which won 4th place for Darwen A.S.



Hobbies Centre Aquatic Group went to town with this Model Village!



Dunfermline A.S. celebrated 25 years with this birthday cake

Yorkshire Aquarist Festival

Large Barbs: Mr. & Mrs. N. Stevenson (Oldham).
Small Characins: Mr. & Mrs. T. Groom (Doncaster).
Large Characins: Mr. & Mrs. Riley (Leeds P.O.).
Rasboras: D. T. Milner (Darwen).
Danios: J. & S. Cresswell (C.L.A.S.S. 1).
Winnows: H. Hoey (Dunfermline).
A.V. Aphyosemion: E. Eyre (N.E.Y., B.K.A.).
A.O.V. Killifish: E. Eyre (N.E.Y., B.K.A.).
Siamese Fighters (True Colours): N. Lynch (Stanley).
Siamese Fighters (Multicolour): K. Webb (A.A.G.B.).
Small Anabantoids: Mr. & Mrs. G. Flint (A.A.G.B.).
Large Anabantoids: D. Penny & Becky (A.A.G.B.).
Endemic Rift Lake Cichlids: T. Sayers (Stanley).
Angels: Mr. & Mrs. Byrom (Ashby).
A.O.V. Small Cichlids: W. Renton (Dunfermline).
A.O.V. Large Cichlids: R. Payne (Merseyside).
Corydoras & Brochis: E. R. Walker (Merseyside).
A.O.V. Catfish (Armoured): T. Sidebottom (Doncaster).
A.O.V. Catfish (Naked): D. Penny & Becky (Doncaster).
Botas & Loaches: Mr. & Mrs. N. Stevenson (Oldham).
Sharks: D. Dennis (Bridlington).
Foxes: J. Wells (Dunfermline).
Pairs Livebearers: D. Barrett (S.L.A.G.).
Pairs Egglayers: C. Henry & D. Dobbie (Dunfermline).
Breeders Livebearers I: D. & P. Lambert (S.L.A.G.).
Breeders Livebearers II: P. & A. Moore (S.L.A.G.).
Breeders Livebearers III: W. Renton (Dunfermline).

Breeders Livebearers IV: D. Barrett (S.L.A.G.).
Breeders Egglayers I: E. Eyre (N.E.Y., B.K.A.).
Breeders Egglayers II: Mr. & Mrs. Byrom (Ashby F.K.).
Breeders Egglayers III: Mr. & Mrs. T. Groom (A.A.G.B.).
Breeders Egglayers IV: T. Sayers (Stanley).
A.V. Livebearer Female: B. & J. Heppingstall (C.B.A.S.).
A.V. Egglayer Female: N. Lynch (Stanley).
A.O.V. Tropicals (Up to 15cm): N. Lynch (Stanley).
A.O.V. Tropicals (Over 15cm): R. Wall (Barnsley).
Tropical Marines: D. Penny & Becky (Doncaster).
Native Marines: D. Penny & Becky (Doncaster).
Common Goldfish & Comets: Mr. & Mrs. Wall (Barnsley).
Shubunkins: Mr. & Mrs. Silk (S.J.S.).
Fancy Goldfish, Fantails, Orandas & Lionheads: Mr. & Mrs. Silk (S.J.S.).
Breeders Coldwater: D. Penny & Becky (Doncaster).
A.O.V. Coldwater: Mr. & Mrs. Silk (S.J.S.).
Aquarium Plants: M. Holden (Darwen).
Amphibians & Reptiles: Mr. & Mrs. Hodges (Scorpion).
Crustaceans, Invertebrates & Anemones: R. & J. Lack (H.C.A.G.).
Individual Furnished Aquarium: R. & J. Lack (H.C.A.G.).
Aquatic Paintings (5-10 years): Angela Walsh (Darwen).
Aquatic Paintings (11-16 years): Christopher Birkinshaw (B.K.K.S.).
Aquatic Paintings (Over 16 years): R. & J. Lack (H.C.A.G.).
Aquatic Photos: P. Robson (Bridlington).
Aquatic Handicrafts (5-14 years): A.L.T. Junior School (Oldham).
Aquatic Handicrafts (Over 14 years): P. Larkin (Huddersfield).

OSCAR



G. Robinson

Meet the Societies



BISHOP AUCKLAND AQUARIST SOCIETY



The B.A.A.S. Badge



Hippocampus kuda

"Our Society began life as Willington & District Aquarist Society over 23 years ago, or so our remaining founder member thinks". Thus begins the list of interesting details that we recently received from Bishop Auckland Aquarist Society.

When you take into consideration the fact that groups of founder members are always extremely small, having even one of these still active in Society affairs after nearly a quarter of a century says a great deal for the worth of the Society in question.

After meeting at various venues in Willington, better facilities became available in Bishop Auckland—hence the change in the Society's name. The aim of the Society is, "to promote and further interest in all aspects of fish-keeping in the area". In order to achieve this, B.A.A.S. (which is affiliated to F.B.A.S. and N.E.F.A.S.) presents its members with a range of activities. For example, any one or more of the following can take place on meeting nights: lectures by visiting speakers or club members, quizzes, slide shows, informal discussions and Table Shows.

Meetings take place twice a month (every other Monday) at the King James I Community Centre, South Church Road, Bishop Auckland, County Durham. Proceedings get underway at 7.30 p.m. and all are welcome. In fact, you are invited to attend a few meetings, without any obligation whatsoever, to enable you to decide whether to join the Society or not.

The Newsletter (a copy of which was sent to us) is particularly good in that it includes lengthy articles of real substance in addition to details of relevant Society affairs.

Many of the B.A.A.S. members are keen exhibitors and have their needs amply catered for in a range of competitions which carry annual trophies for the Best Open Show Exhibitor, Best Table Show Exhibitor, Best Fish of the Year and Best Home Aquarium.

Trips are also organised to fish shops outside the local area and to the 'National' Fish Shows. The highlight of the year, though, is the Society's own successful Open Show.

Subscription Rates: Adults, £2.50; Family, £3.50; Juniors, £1.00.

Apply to: Mrs. Christine Zamir, 20 Widecombe Walk, Ruddhill Estate, Ferryhill, Co. Durham. Tel. (0740) 51922.

DUNSTABLE & DISTRICT AQUARIST SOCIETY



Dunstable & District Aquarist Society

The D.D.A.S. Logo



Pterophyllum scalare

AROUND 1951, the Luton Aquarist Society (which was formed before the Second World War) changed its name to the Dunstable & District Aquarist Society. This conveniently coincided with a change of meeting venue, again from Luton to Dunstable, which has been maintained up to the present day.

The original aims of the Society were, "to further the study of all forms of aquatic life and to assist aquarists". These hold just as true today as on the day they were originally agreed upon. Therefore, D.&D.A.S. provides a varied programme of activities which includes lectures by guest speakers, a monthly Table Show and raffle, and a home aquarium and plant competition. In addition, twelve trophies for particular species are competed for during the course of the year with the prizes presented at the year-end dinner and dance.

Away from functions concerned predominantly with fishkeeping, the Society also runs a social programme which includes a summer disco or barn dance and a barbecue.

D.&D.A.S. has tended not to compete as a club at major (national) Shows in recent years, directing its efforts instead predominantly at Shows held relatively locally.

Travel by car to these and other events is often co-ordinated via the Society's monthly Newsletter which also contains details of forthcoming events, competitions, fish and aquatic items for sale, cryptograms and a wry look at the previous month's meeting.

Meetings are held on the second Wednesday of every month at The Queensway Hall, Dunstable, Bedfordshire, LU5 4EU, starting at 8.00 p.m. This venue is a particularly good setting for the meetings because it also houses a licenced bar which is often open for any shows and concerts that may be taking part in other parts of the Queensway complex.

The D.&D.A.S. draws the majority of its members from Hertfordshire, Bedfordshire and Buckinghamshire and, in order to ensure the widest possible choice of speakers, is affiliated both to the Association of Aquarists (A of A) and the Federation of British Aquarist Societies (FBAS).

Subscription Rates: Adults, £5.50; Joint, £6.50; Juniors, £3.50.

Apply to: Mr. John Guggiari (Secretary), Sands' Bequest, 49 Stockingstone Road, Round Green, Luton, Bedfordshire, LU2 7ND.



From Aquarists' Societies

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

NEW AQUARIUM CLUB FOR MORPETH
A new club in this area, named **MORPETH AQUARIST SOCIETY** has been formed. We meet every second and fourth Wednesday of each month at the Y.M.C.A. Morpeth at 7.30 p.m. for further details contact Harry Kennard, 22 West Park, Morpeth, Northumberland NE61 2JP. Tel: Morpeth 549747.

OCTOBER

8th October: BRISTOL TROPICAL FISH CLUB 'Silver Jubilee' open show at All Saint's Church Hall, Grove Road, Fishponds, Nr Bristol. Schedules (from mid-June) and other information from Mr. T. E. Davis, 784 Radminton Road, Cotham, Bristol, Nr Bristol BS17 2QW. Tel: Winterbourne 775432 a.s.e. with applications please.

6th October: SUNDERLAND open show to be held in the Pennywell Community Centre, Pennywell, Sunderland, Tyne Wear.

6th October: EDINBURGH AQUARIUM & PONDKEEPERS open show at Craigroyson Community Centre, Edinburgh. Further details from Alan Scott, 11 Rowan Street, Dunbar, East Lothian EH14 1PR.

6th October: HALIFAX A.S. open show at Forest Cottage Community Centre, Cousin Lane, Ilkley, Halifax. Please note Auction starts 1.30 p.m. show 2 p.m. Schedules from David Shalick, "Cobbestones", Gaisner, King Cross, Halifax HX2 1DT. Tel: Halifax 60116 (a.s.e. please).

6th October: CENTRAL MIDLANDS CICHLID GROUP, 2nd Cichlid only open

show, at Rothbampton College of Agriculture, Nr Penkridge, Staffs. Further details from Reg or Mary Hall, 71 Saxon Road, Penkridge, Staffs, ST19 5EP or Phone Cannock 73196 days Penkridge 3944 evenings.

13th October: HAVANT & D.A.S. Annual Auction at Merchants Hall, Horedean. Buying or selling, everyone welcome. Telephone entries contact: M. Shepherd on Havant (0709) 424604.

13th October: PRESTON & DISTRICT A.S. Public Auction of fish, plants, and equipment, at the Lancashire Poly in Preston. Refreshments and excellent parking. Booking in of lots 12.00-1.30. Auction to start at 1.30 p.m. with Derek Harrop your auctioneer. Further details from Mr. J. Taylor, Secretary. Tel: 0772-313079.

13th October: BLYTH A.S. 1st open show at Eadsey High School, Blyth, Northumberland. Further details from Stefan A. Holmes, 14 Cottingham Green, Newsham, Blyth, Northumberland NE24 4TF.

13th October: WHITBY & DISTRICT A.S. open show cancelled due to lack of support.

13th October: TORHAY A.S. grand open show at the Newton Abbot Community Centre, Newton Abbot. For details/show schedule send a.s.e. to Lee Stevens, 77 Howards Way, Wildwoods Copse, Newton Abbot, Devon.

19th October: ILFORD & DISTRICT AQUARIST'S & PONDKEEPER'S SOCIETY Annual Exhibition of Fish at The Ilford Town Hall, Ilford, Essex. Doors open 11 a.m.

19th October: BRITISH AQUARISTS STUDY SOCIETY A.G.M. at The Haven Hotel, London Road, St. Albans, Herts.

Time: 2 p.m. to 5 p.m. Dinner following at 7 p.m. *Speaker:* Dr. David Ford. *Subject:* Aquaria International, Aquariums keeping in 20 different countries. *Please contact:* Hon. Sec. Mrs. M. Williams, 85 Dorchester Road, Leicester, for further details.

28th October: SOUTH LEEDS A.S. open show at Collingham Memorial Hall, Collingham, Nr. Leeds. Further information from Mr. Tomkinson, 6 Simons Row, Middleton Leeds LS10 4JZ.

27th October: PETERBOROUGH FISH-KEEPERS ASSOC. 1st open show at the Crosses, Barton, Peterborough. Further details from David Harper, 17 Weyman, Orton Goldhay Peterborough. Tel: 0733-234261.

27th October: TYNE TEES AREA ASSOCIATION (F.H.A.S.) open show at Peter Lee Leisure Centre Bensing until 2 p.m. Further details from Mr. P. Barrow, 18 Woodgate Gardens, Bill Quay, Gateshead, Tyne & Wear NE10 0ST.

27th October: WEST CORNWALL FISH-KEEPERS 1st open show at Camborne Community Centre. Further details from show manager, A. N. Ellis, 19 Progress Road, Camborne, Cornwall. Tel: 0206-717720.

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16th November: BRADFORD & DISTRICT AQUARISTS SOCIETY open show. Details obtainable from show secretary, Mrs. S. Hinchliffe, 9 Barle Lane, Gosat Horton, Bradford. Tel: 0274-902269.

★ ★ ★ SPECIAL ANNOUNCEMENT— ★ ★ ★ coming next month

The *Aquarist & Pondkeeper*, Britain's longest established and best-loved aquarium magazine, takes on a brand-new look in November. It will be larger, carry more full-colour pages, feature new writers (including the top names in the hobby), and will be more available than ever before. **All this, and much, much more—still for the same unbelievable value-for-money cover price of 85p!**

The re-launch will coincide with Europe's largest public aquatic Show, the **British Aquarist Festival**, at Belle Vue, Manchester, on the 2nd and 3rd November. Come and see us at our stand; we will be delighted to take you on a "Guided Tour" of our new magazine.

As a sampler, just take a look at a few of the exciting articles scheduled for our re-launch issue.

SIX OF THE BEST by Dick Mills, world famous author and highly respected ambassador of our hobby selects six favourite fish.

CORRECT FEEDING by David Ford, Head of Aquarian Laboratories and internationally recognised authority on fish nutrition.

GIANT TOADS OF THE WORLD by herpetologist Dr. Andrew Allen.

THE ISRAELI EXPERIENCE. A full colour account of his visit to the Red Sea by our own Consultant Editor, John Dawes.

SALTWATER SELECTION by David Sands. A general key to success when choosing tropical marine fish.

PRODUCING CHAMPION GOLDFISH by Pauline Hodgkinson of the Northern Goldfish and Pondkeepers Society.

Look out also for articles on **Corydoras Catfish, Lemon Tetras and Spiny Lobsters.**

Our regulars will, of course, be there in force, helping to make the new *Aquarist & Pondkeeper* better than ever before with their highly individual, respected, informative and enjoyable contributions. You just cannot afford to miss the November issue of the *Aquarist & Pondkeeper*. **Order your copy early. It will be the best 85p you have ever spent!**

