JANUARY 1987 95p

AQUARIST

AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

THE AMAZON EXPERIENCE

Focus on fish health

DAZZLING DWARF ANGELS

The pond in winter

WIN A £500 LAHAINA AQUARIUM SYSTEM

PUBLISHER
Andrew Blair
MANAGING EDITOR
Val Williams
EDITOR
John A. Dawes
PRODUCTION EDITOR
Paul Davies
PRODUCTION MANAGER
Christopher Benn
ADVERTISEMENT MANAGER
John E. Young

PUBLISHED BY Buckley Press Ltd.
58 Fleet Street, London EC4Y 1JU
TELEPHONES: ADVERTISING AND PRODUCTION (0892 83) 5544
ACCOUNTS 01-583 0175

SUBSCRIPTIONS
£15 per annum (UK only) including postage, overseas and airmail rates on application. All subscriptions are payable in advance. Cheques or International Money order should be made payable to Buckley Press Ltd. and sent to:
Aquarist Subscriptions
Subscriptions International Ltd.
92 Queensway
Bletchley
Milton Keynes MK2 2QV
Telephone: 0908 70761
USA Distributor:
LEWIS BOOKS

ISSN 0003-7273
Printed by Hastings Printing Company Ltd.

Cover Story

Photograph: Ardea

The Harlequin Wrasse or Harlequin Tusk-fish, *Lienardella fasciata*, is a ferocious-looking inhabitant of the Great Barrier Reef and some of the islands south of Japan. Yet, despite its sharp, pointed teeth, it is not generally considered an aggressive member of the tropical marine community aquarium Harlequins are, however, aggressive towards members of their own species and are, therefore, best kept singly. Ease of feeding (invertebrates such as worms are a great favourite), relative hardiness, some resistance to elevated nitrite levels and an ability to adapt to a range of pH values, are all characteristics that make this a much sought-after species.

AQUARIST
AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

JANUARY 1987 Vol. 51 No. 10

CONTENTS

MOTHER OF EXILES

By Amanda Grimes

The price of falling victim to the 'Refugee Syndrome'

Should you ever visit the Statue of Liberty, you will find inscribed at its base a poem by Emma Lazarus. Describing the statue as the "mother of exiles", her lines proclaim: ". . . Give me your tired, your poor, your huddled masses . . . the wretched refuse of your teeming shore . . ."

While some of you might find the parallel between this huge ideal and fishkeeping somewhat farfetched, I cannot think of a better one. Maybe because I am a woman and given to maternal feelings, and many of you are men — and very macho? Even if you would not go as far as comparing yourselves with America, surely you must admit that your tanks play host to fish from all over the world; fish taken from different backgrounds and communities, possibly suffering from jet-lag and most probably from culture-shock.

As a beginner in this fascinating interest, I fell victim to what I can only describe as 'Refugee Syndrome'. I am one of those people who go to Battersea Dogs' Home for a kitten and come away with three cats, half a dozen dogs and a bemused attendant who happened to be cleaning out the cages and looked miserable. I am, in short, a mug.

"You can't put an Oscar in a community tank," wiser friends would say.

"But it's all by itself!" I'd protest, meeting the dejected stare of the fish in the shop heart on.

"Probably because it ate everything else . . ." they'd mutter and drag me away. This predatory argument had brought me up short. It's about the only argument that does. I had once watched in horror as a friend fed young Platies to his huge Cichlids and the memory is still with me.

Six months or so later: "There's a *Corydoras elegans* in this tank."

"We don't need another one, we've got a pair."

"It's the only one in here. No one will buy it."

Silence. I bought it. *Corydoras* make very convincing refugees. I think it's the eyes . . .

When one of my refugees, a lone striped barb of unknown sex, roed up, I promptly phoned round to track down some males. It was a few weeks before I was able to release three more into the tank. She never roed again.

In all this, I was the shopkeeper's dream come true. I could be relied upon to clear up all the odds and ends — and there were plenty of them. If I listed them all here, you'd be asleep inside two minutes and the Editor would fire me, so moving hastily on . . .

Like most beginners, I started with a community tank, moving gradually on towards my present total of nine. I had it in mind to breed my fish, hence the acquisition of new tanks. But this was hampered by the 'Refugee Syndrome'. As the poem says: ". . . the wretched refuse of your teeming shore . . .". If my shore had been any more teeming, it would have been called Dunkirk. Having impulse-bought my way round every shop I could reach, I soon ran into trouble. On the merit side, I would point out here that I'm not a complete idiot. Bet that brought you up short! I had followed *some* advice in that I never bought unhealthy fish — at least, not obviously unhealthy, like covered in White Spot or lying motionless on the tank bed.

I simply transferred my 'refugee' collecting to my own tanks. Take, for instance, Tiger Barbs. I like these fish, but then my family says I like anything yellow, which is true. Whenever I mention Tiger Barbs, people's faces go a grey colour. This puzzles me, as most of my friends don't keep fish. Anyway, as you may or may not know, Tiger Barbs are great in a crowd, being thoroughly active and colourful fish. Three or less, on the other hand, are vicious, snappy creatures. So when my numbers of these barbs declined through old age, breeding scuffles and so forth, I had to get them out of the community tank quickly until I could make up their group again. This was the start of my 'refugee tank'.

Once the Barbs were back, in a larger group, in their 'home', this new tank provided a refuge for bullied fish — Sparkling Gouramis; shy fish — Glass Catfish; bereaved fish — you name it, the tank played host to it; and dying fish — to stop the others harassing it. In effect, there were times when I was running a two-foot tank for one two-inch fish. After a year of this, it occurred to me that something was wrong . . .

The something was me. I had to toughen up. I started returning the shy fish to shops or giving them to friends. The widowed Cichlids were left to get on with it until another partner could be found for them. Dying fish were dispatched with speed and, I'm not ashamed to admit, a fair amount of tears. Finding one of your best fish dead is disappointing; killing that fish can be heartbreaking. It is the toughest part of being an aquarist.

BRITISH AQUARIST FESTIVAL RESULTS

As promised, here are all the main results from the **British Aquarist Festival** held at Belle Vue on 1 and 2 November. For a report on the Festival, see **Adrian Blake's** article in the December '86 issue of *Aquarist & Pondkeeper*. The illustrations that accompanied Adrian's feature were taken by **Ian Legge** of **Tongham A.S.** Ian was, himself, the winner of several major awards at B.A.F., including the First Prize in the section for "Photographs of Furnished Aquaria". Congratulations to him and all the other B.A.F. winners, and sincere thanks to Ian for allowing us to use his photographs.

Highest Pointed Tableaux (Harry Penhall Memorial Trophy)
1. Tongham **2.** Reading **3.** Darwen **4.** Bridgwater **5.** I.O.W.
Best Fish in Show. P. Moye, Basingstoke.
Highest Pointed Society Furnished Aquarium. Halifax.
Highest Pointed Individual Furnished Aquarium. A. Woodhead, Halifax.
Highest Pointed Pair of Fish (Billy Kelly Memorial Trophy).
T. & D. Cruickshank, C.A.G.B.
Highest Pointed Aquascape. D. Milner, Darwen.
Highest Pointed Novelty Aquascape. Mr and Mrs Walsh, Darwen.
Highest Pointed Breeders' Team. Mr and Mrs J. Holden, Darwen.
Best Tropical Fish (G. Cooke Memorial Trophy).
P. Moye, Basingstoke
Best Coldwater Fish (Belle Vue Challenge Trophy).
Mr and Mrs Silk, S.J.S.
Exhibitor Gaining Most Awards (Basingstoke Challenge Trophy).
I. Legge, Tongham

Champion of Champions
1. Mr L. Gale, Basingstoke. **2.** Mr K. Fowler, Workington. **3.** Mr and Mrs Baldwin, Sandgrounders.
Show League
1. Sandgrounders A.S. **2.** Merseyside A.S. **3.** Oldham A.S. **4.** Potteries A.S. **5.** Wrexham A.S.

Section	Trophy	Exhibitor	Society
Tropical Furnished Aquarium (Soc.) and Coldwater Furnished Aquarium (Soc.)	Cussons Silver Challenge Trophy		Halifax Halifax
Tropical Furnished Aquarium (Ind.)	Walter Smith Coronation Shld	A. Woodhead	Halifax
Coldwater Furnished Aquarium (Ind.)	Edgar Chapman Memorial Trophy	A. Woodhead	Halifax
Marine Furnished Aquarium (Ind.)	F.N.A.S. Marine Trophy	P. Corbett	I.O.W.
Aquascape (Furnished)	Stan Taylor Memorial	D. Milner	Darwen
Novelty Aquascape	James Kelly Trophy	Mr & Mrs Walsh	Darwen
Plants	F.N.A.S. Shield	D. Shields	Halifax
Common Goldfish and Comets	F.N.A.S. Goldfish & Comet Trophy	T. Marshall	Halifax
Shubunkins (Bristol/London)	G.S.G.B. Silver Cup	Mr & Mrs Silk	S.J.S.
Moors & Veiltails	Walter Smith Challenge Trophy	Mr & Mrs Silk	S.J.S.
Fancy Goldfish — Fantails — Orandas — Lionheads — New Variety	The Chester Cup	Mr & Mrs Colley	Oldham
A.O.V. Coldwater (Not listed above)	The Derby Cup	I. Legge	Tongham
A.V. Coldwater Pairs	The Nottingham Challenge Shield	Mr & Mrs Silk	S.J.S.
Coldwater Breeders (A.V. Single Tail) and Coldwater Breeders (A.V. Twin Tail)	The Hammond Trophy	D. Caesar Mr & Mrs Silk	Tongham S.J.S.
Guppy Molly Platy Swordtail A.O.V. Livebearer	Lewis Trophy	G. Lemm C. Martin B. & S. Parr J. Keeley P. Andrews	Halifax Skelmersdale Oldham Merseyside Reading
A.V. Livebearer (Pairs)	Frazer Brunner Silver Cup	D. Barrett	S.L.A.G. - UK
Rift Valley and Lake Cichlids Dwarf Cichlids A.V. Large Cichlids	F.N.A.S. Trophy	Mr & Mrs Baldwin L. Gale J. T. Morris	Sandgrounders Basingstoke Sandgrounders
A.V. Cichlids Pairs	National Aquarist Society Cup	I. Legge	Tongham
Siamese Fighter Small Anabantoids Large Anabantoids	The East Lancashire Society Trustees Trophy	A. Crossman K. Buckley Mr & Mrs Baldwin	Skelmersdale Bridgwater Sandgrounders
A.V. Anabantoids Pairs	F.N.A.S. Trophy	Stear Family	Stretford
Small Barbs Large Barbs	F.N.A.S. Trophy	T. & D. Cruickshank Mr & Mrs Stevenson	C.A.G.B. Oldham
A.V. Barbs Pairs	A. & P. Silver Cup	T. & D. Cruickshank	C.A.G.B.
Small Characins Large Characins	F.N.A.S. Trophy	Mr & Mrs Robinson J. T. Morris	Scorpion Sandgrounders
A.V. Characins Pairs	East Lancashire Society Silver Cup	Mr & Mrs Hulse	Oldham
Sharks and Foxes Rasboras Danio and Minnows	F.N.A.S. Trophy	Mr & Mrs Baldwin D. Sidebottom Mr & Mrs Baldwin	Sandgrounders Oldham Sandgrounders
A.V. Carp and Minnows Pairs	The Warwick Shield	Mr & Mrs Riley	Leeds
Corydoras and Brochis Catfish A.O.V. Catfish	Stan Taylor Trophy	K. Fowler P. Moye	Workington Basingstoke
A.V. Catfish Pairs	The York Shield	S. Barnes	Bracknell
Egglaying Tooth Carps	F.N.A.S. Trophy	S. Halfpenny	B.K.A.
A.V. Egglaying Tooth Carp Pairs	F.N.A.S. Silver Challenge Trophy	B. Drake	B.K.A.
Loach	F.N.A.S. Trophy	D. T. Milner	Darwen
A.V. Loach Pairs	The Durham Silver Cup	Mr & Mrs Baldwin	Sandgrounders
Tropical and Native Marine Fish	F.N.A.S. Silver Trophy	M. Heaps	St. Helens
Tropical and Native Marine Fish Pairs	Ron Atherton Shield	Miss Andrews	Belle Vue
A.O.V. Tropical Fish (Not listed above)	F.N.A.S. Trophy	M. Doubbday	Bracknell
A.O.V. Tropical Fish (Not listed above) Pairs	Leeds & District A.S. Rose Bowl	Mr & Mrs Baldwin	Sandgrounders
Breeders Egglayers (Group 1) Breeders Egglayers (Group 2) Breeders Egglayers (Group 3) Breeders Egglayers (Group 4)	F.N.A.S. Trophy	Mr & Mrs J. Holden J. Davidson K. Buckley K. Buckley	Darwen Halifax Bridgwater Bridgwater
Breeders Livebearers (Groups 1 & 2) Breeders Livebearers (Groups 3 & 4)	F.N.A.S. Trophy	K. Buckley M. Strange	Bridgwater Basingstoke
Amphibians (Non-dangerous)	Bob Tomlinson Trophy	Mr & Mrs Hodges	Scorpion
Aquatic Painting (5-7 years)		E. Cadd	Oldham
Aquatic Painting (8-11 years)		P. Brightmore	Stretford
Aquatic Painting (12-16 years)		M. Hall	Workington
Aquatic Painting (Over 16 years)		M. Hole	Bridgwater
Photographs of Fish		A. Morris	Bridgwater
Photographs of Furnished Aquaria		I. Legge	Tongham
Aquatic Handicraft (Up to 16 years)		L. Holden	Darwen

KEEP THEM SAFE ALL WINTER

Writer, editor and watergardener, **Edward Lea**, describes the dangers facing fish over the winter months and sets out his formula for survival.

Imagine yourself in a sealed room that is slowly being filled with poison gases. The fish in your garden pond could be in the same predicament during hard frosts, if their 'living room' has not been properly maintained.

REGULAR MAINTENANCE

To keep them alive and well throughout the winter, some maintenance in spring, summer and autumn is essential. This should, of course, have been done by now. For example, all through the year as much decaying matter as possible should be removed from ponds. This is especially important in autumn and early winter. A long-handled lawn rake with blunt-ended tines can be a useful tool for drawing leaves up from the bottom of the pond to the edge — if some dexterity is applied. Two lawn rakes used in conjunction are even better.

If leaves are a problem, a temporary fence on the windward side will help considerably. This could be a length of fine-mesh garden netting, about a metre high, strung between posts to act as a barrier.

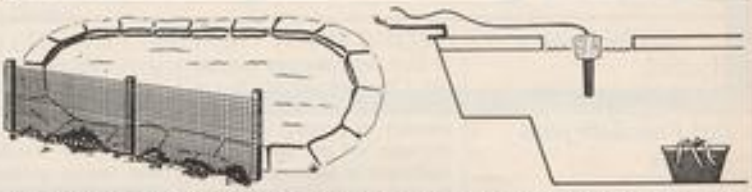
There could be dire consequences if the debris from plants is allowed to decompose at the bottom of the pond because, when ice completely seals the surface, there is no escape for hydrogen sulphide and methane gas. The fish could be suffocated through a serious deficiency of oxygen. Ponds should, of course, be the recommended depth for their size and should never be overstocked with either fish or underwater plants.

FEEDING

Toxic gases also come from decomposing food. Artificial feeding from November to at least March is likely to do more harm than good because fish, being cold blooded, take their temperature from the surrounding water. Fix an outdoor thermometer outside a window that doesn't catch the sun, so that you can read it from inside your house. If the temperature is under 10 Celsius (50 Fahrenheit) do not feed your fish at all. At such times they are unlikely to be very active and will largely ignore the food which will start to decompose at the bottom of the pond. Problems could also occur if they do eat, because their digestive systems will have slowed down and be unable to cope with food.

HARDIEST VARIETIES

Hardy varieties of fishes, suitable for an outdoor pond, are capable of surviving the severest winter. If the condition of your pond is healthy you will rarely have problems with Goldfish, Comets, Shubunkins, Golden or Silver Orfes, Koi, Rudd, Tench or other native species. The winter will often kill the fancy Goldfish, such as the Moor, Celestial, Veiltail, Fantail and Oranda. They are, therefore, not recommended for the outdoor pond in winter.



Top, despite appearances, life ticks on, slowly, under ice and snow. Above left, a temporary fine mesh fence to catch leaves on the prevailing wind side of the pond. Above right, low voltage pool water heater keeping small area free of ice. On contents page, high tensile strength fishing line stretched across the pond can deter predatory birds.

THE ICE-FREE HOLE

When the pond is frozen over, you should try to keep, at least, one opening in the ice. This will allow some exchange of toxic gases and oxygen. The old method of making a hole was to place a non-electric kettle filled with boiling water on the ice every morning. This would effectively melt the ice, the spout and handle preventing the kettle from falling in the water. If the ice is very thick you might find it more practical if you keep pouring boiling water in one place — but not where the fish are. To avoid stunning the fish, refrain from breaking the ice with a hammer or your heel. I suggest that all these methods are too crude and are often used when it is too late.

Much more effective would be a low-power electric immersion heater, complete with float. They can still be bought for around £10 and will keep an area about a foot in diameter free of ice all day and, more importantly, all night. If you have an electrically-powered waterfall or fountain, it will be easy to plug an immersion heater into the supply and take the pump indoors for the winter. Whenever frost is forecast simply switch on the immersion heater. No electric supply? Get a qualified electrician to bring power to your pond, if you are at all unsure about your competence. To save on cost you may be able to dig a narrow trench beforehand, so that the electrician can run a spade-proof, rodent-proof conduit through your garden.

Where no electricity supply is feasible, you will have to try other methods, for it is essential to prevent the pond from freezing over for long periods. On smallish ponds you could lie a garden frame across one end, or construct your own to create a greenhouse effect over the whole pond. Even less aesthetically pleasing is to wrap polythene sheets around planks, taking care not to shut out too much light from the water.

DANGERS OF DARKNESS

The most dangerous period for fish is in the hours of darkness. Plants that happily

supply the fish with oxygen during daylight hours, do not do so at night. They do, however, continue to give off carbon dioxide. That is why it is usually in the morning that dead fish are found floating on the surface as a result of a sudden change in the pH (the degree of acidity or alkalinity of the water) during the night.

A blanket of snow on top of the ice can make things even worse by keeping the plants in darkness during the day. If the snow isn't hosed or brushed away quickly, the effect could be catastrophic for the fish. It is imperative that light should reach the underwater plants.

WATER QUALITY

If you suspect that the water quality is poor, it would be advisable to introduce some fresh water into the pond as an emergency, preferably by spraying a hosepipe on the pond surface to increase the oxygen. If you are unsure of the water quality of your pond, pH testing kits are available for under £2. They show, with the help of a simple colour comparison chart, whether the water is acid, alkaline, or neutral.

OTHER ENEMIES

Other enemies of fish, besides careless owners, are birds — namely herons, kingfishers and gulls. I used to wake up to see a heron patiently waiting for its breakfast at the edge of my pond. Over a period of time it managed to swallow several goldfish simply by wading into the pond. At first I tried covering the pond with plastic garden netting. This kept the heron away but, as the pond is rather large, the effect was far from pleasing. Then I tried black cotton stretched across and along the sides. This, of course, was not strong enough to deter the heron. Finally, I stretched strong fishing line in chequered fashion. It is fastened to the tops of wire hoops coated with green plastic, originally intended for garden cloches. The fishing line is several inches above the water and is unobtrusive. It has had a definite deterrent effect on the heron.

Take a careful look at your fish every day. If the water quality is good, none of them should be troubled by disease or parasites. In winter you should be able to rely on the water remaining extremely clear. As the fish are not very active, they will not stir up any brown mulm from the bottom.

If a pond is well-balanced with plants and fishes and you can prevent debris and uneaten food from rotting in the pond, good quality water and, therefore, healthy fish will be your reward this winter.

TEN GOLDEN RULES

1. Good pre-winter management is essential.
2. No feeding during winter months (or very little during 'warm' spells).
3. Stock only with hardy varieties of fish.
4. Maintain, at least, one ice-free hole at all times.
5. Ensure that light gets through to the plants.
6. Keep a check on water quality.
7. Protect the pond against falling leaves.
8. Protect the pond against predators.
9. Ensure that the pond is deep enough (at least 18 inches).
10. Check condition of the fish regularly.

Letters

Mystus, Kryptopterus and *Poecilobrycon* Secrets

In February 1985, you published an article I wrote on the first spawning of *Mystus armatus*. Since then, I have been very keen to discover the nature of the stimuli which trigger off spawning in these fish. My studies indicate that the following may be of crucial importance in providing the necessary pre-spawning stimuli in this, and probably other, more attractive, species in the genus:

(a) large-scale water changes;
(b) planting of large quantities of Indian Fern;
(c) violent aeration.

If all three conditions are provided simultaneously (or nearly so), the fish are triggered into a spawning sequence, probably because this combination simulates monsoon-type conditions.

Water conditions in my area are 3°DH and pH 6.8. The temperature of the spawning tank should be around 78°F. Interestingly, *Kryptopterus bicirrhis*, the Glass Catfish, also responds to these conditions.

On another subject, I have noted that the fry of *Poecilobrycon* (*Nannostomus*) *harrisoni* take atmospheric air, at least, until they are 8 weeks old. I have not seen this fact in print anywhere. Furthermore, contrary to existing literature, the eggs are not laid on the underside of leaves — neither are they guarded by the parents. Instead, they are laid singly, and at random, among floating plants and totally ignored. Only 12-20 eggs are deposited at any one time, but a good pair will spawn every ten days.

Frank Garside
Oldham

Editor's Note

Very interesting! Have any other readers had similar, or contrary, experiences with these fish? We'd like to know — so would thousands of others.

First Anniversary Prize

What a pleasant surprise! Having just returned from a most enjoyable holiday, I discovered that I had won second prize in the August competition run jointly by *A & P* and **Tetra.**

As this coincided, almost to the day, with my first anniversary as an aquarist, it would appear that my pleasure in fishkeeping could be tinged with a certain amount of luck (Amanda Grimes' serendipity?). So now, as I plunge into setting up my fourth tank, I look forward to many happy years in the hobby, reading the *Aquarist & Pondkeeper* and, who knows, perhaps winning first prize next time round?

William Grey
Glasgow

Editor's Note

Congratulations to William and all other winners of our highly successful **Tetra** competition. Clearly, it pays to buy *A & P!* Look out for even more competitions in 1987 — starting this month.

Help for Tortoises and Terrapins

Every year thousands of tortoises perish, or are permanently disabled, because owners fail to manage hibernation properly. Each spring our sanctuary is full of hibernation casualties.

We would be grateful if you would help us to reduce this annual carnage by drawing public attention to our guides and leaflets.

We are also always very pleased to hear from skilled aquarists and herpetologists who may be able to offer good homes to unwanted terrapins and tortoises. We have, in fact, just set up a terrapin and tortoise re-homing register aimed at putting owners of unwanted specimens in contact with people willing and able to offer homes.

Our list of leaflets and guides is as follows:—

1. Safer hibernation and your tortoise
2. Tortoise Trust re-homing services
3. The Law and tortoise sales
4. Caring for blind and sight damaged tortoises
5. The care of eggs and hatchling tortoises
6. Basic husbandry of Box Tortoises
7. Basic husbandry of terrapins and turtles
8. Basic husbandry of European tortoises
9. First aid care of injured tortoises
10. Identify your tortoise
11. The captive maintenance of tropical tortoises.

When ordering leaflets, please enclose a S.A.E. for our reply. To cover printing and other costs, we also ask for 20p per leaflet (50p for the Hibernation booklet).

We look forward to hearing from *A & P* readers.

Andy Highfield
The Tortoise Trust,
P.O. Box 191,
Norwich, NR15 2HY.

Books

Colourful update on central African Cichlids

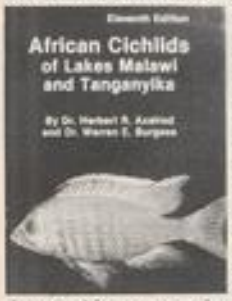
African Cichlids of Lakes Malawi and Tanganyika (Eleventh Edition)

By: Dr. Herbert R. Axelrod and Dr. Warren E. Burgess
Published by: T.F.H. Publications, Inc (1986) ISBN: 0-86622-046-1 Price: £15.95

This new, enlarged and revised edition of T.F.H.'s highly successful book follows the same basic format as its predecessors, i.e. a large number of colourful, informative photographs, mostly of good quality, accompanied by relatively little text.

As an identification guide, it will peove extremely useful indeed containing, as it does, quite a few of the more recent and "not-yet-well-known" species of African Cichlids. In this sense, the eleventh edition is the most impressive one yet.

This publication was never intended to act as an all-encompassing guide to the keeping of African Cichlids in aquaria. It is, therefore, unfair to criticise it for its comparative lack of detailed information on the control/treatment of diseases, the best techniques for successfully spawning the fish in aquaria and so on. Hobbyists should look elsewhere for this.



Where this book scores very highly is in the comprehensive photographic coverage given to the fish of the two lakes in question. I cannot think of any other widely available single volume that does this better.

Where it falls down in my opinion is in its scant regard for the important nomenclatural changes that have come about in recent years and which are now pretty widely accepted. In particular, the complexities surrounding the various "morphs" of *Pseudotropheus zebra* deserve more space than just a single, passing comment. So does the now well-known name change from *Haplochromis burtoni* to *Astatotilapia burtoni*. In this respect, cichlid specialists, both at the hobby and trade level, may find the text a little disappointing.

The style of page numbering is still (as it was in previous editions) a weak point, with numerous unnumbered pages occurring between numbered ones. This makes life rather difficult when trying to trace a particular illustration given a page number in the scientific index. Sooner or later (preferably sooner), the publishers should give this matter serious consideration.

Nevertheless, the eleventh edition of this worthwhile publication serves a very useful purpose and will be enjoyed by all fishkeepers who want to see more than just the "bread-and-butter species" which often adorn the pages of other books. At £15.95 the eleventh edition of "African Cichlids of Lakes Malawi and Tanganyika" represents a very good buy.

John Dawes

Fish for the invertebrate world

Fishes for the Invertebrate Aquarium
By: Helmut Debelius
ISBN: 3-87401-052-X
Price: £13.75
Sole Distributor for the UK:
Tropical Marine Centre Ltd.,
Imperial Studios,
Maxwell Road,
Borehamwood,
Herts.

An eminently suitable companion to 'Armoured Knights of the Sea' by the same author (reviewed in *A & P* in July 1986), this latest publication by Helmut Debelius is a real gem for the specialist marine aquarist. Had it contained detailed instructions on how to set up and maintain marine aquaria, it would have also been just right for beginners. However, such an approach would have resulted in a very different book indeed.

Despite its title, don't expect to find just a catalogue of fish in this well-produced publication — it is far more than just a glorified species list (although the chapters are, in fact, allocated to individual families or genera).

The text is written in partly anecdotal, partly aquaristic and partly scientific style. In the hands of a less competent author, this apparent clash might not have worked. In Helmut Debelius' hands, it does. The result, therefore, is a book that provides the sort of insight that established aquarists are constantly looking for, but do not always get. It is a mine of information, liberally illustrated with colour and black-and-white photographs of numerous species, including some of the lesser known ones. One minor quibble: scientific names are, surprisingly, not italicised as they should be, particularly in such a respectable book as this.

'Fishes for the Invertebrate Aquarium' is dedicated to Dr. Roger Lubbock, a scientist and diver, and a friend of the author, who died in 1981. Details of some of Roger Lubbock's discoveries, experiences and expeditions have been included at relevant points by Helmut Debelius, thus giving this book the kind of human involvement that, added to the anecdotal style referred to earlier, contributes significantly toward making the text extremely readable.

In conclusion, this is a book which I would recommend very highly to anyone wishing to go "below the surface" to find out just that little bit more about the abundant range of fish species that can be safely housed with invertebrates.

John Dawes

Extensive guide to marine invertebrates

The Saltwater Aquarium for Tropical Marine Invertebrates (2nd Edition)
By: Peter Wilkens
ISBN: 3-921677-02-5
Price: DM58
Published by:
Engelbert Pfriem Verlag,
Else-Lasker-Schüler-Strasse 47-49,
5600 Wuppertal 1,
West Germany.

Comprehensive books on marine invertebrates are relatively difficult to find, as anyone who has set out to buy a selection of such books will know only too well. Therefore, when I came across this particular publication, I grabbed it — even though it is an English translation of a 1973 German book (2nd edition).

Developments in marine aquarium technology over the last ten years have revolutionised the hobby so dramatically that the sections on equipment in this book need to be read with this in mind. Nevertheless, the basic principles remain and the technological and biological chapters can still provide a great deal of useful information.

Where this book really scores is in its extensive coverage of invertebrate species. Few books, for example, will have anything on jellyfishes — this one has (not a lot — but something, at least). Sponges, anemones, corals, segmented worms (e.g. bristle and fanworms), shrimps, prawns, lobsters, mantis shrimps, crabs (including horseshoe, hermit and spider crabs), chitons, gastropods (i.e. snails, earshells, cowries, seaslugs, etc.), bivalves (e.g. clams), octopus, sea-urchins, featherstars, sea-cucumbers and starfishes (including brittle stars) are all given considerable space. Many are also illustrated; quite a few in colour.

The last few pages are given over to an Appendix (a detailed classification of invertebrates), instructions for constructing a home-made protein skimmer (and its operation), a summary of aquarium equipment and its use, a bibliography and an index of scientific names.

All in all, this is a useful book to have around — always bearing in mind that some names will have changed and that aquarium technology, like "Time" and "Tide", waits for no Man.

John Dawes

THE POSITIVE APPROACH TO FISH HEALTH

Some aquarists respond to the slightest hint of trouble by dosing a tank to its limit with medicines. While this is sometimes absolutely necessary, much distress can often be avoided by taking preventative measures. **John Dawes** describes the positive approach to healthy fishkeeping.

I always find it depressing to hear people refer to fish health under the general catch-all term of "fish diseases". To me, this label has very negative overtones and symbolises a "reactive" view of fish health, rather than a "preventative" one. In other words, it's the same as doing absolutely nothing positive about maintaining one's own personal state of health but, rather, of waiting until something go. wrong and then reacting by treating it with one medicine or another — or a comprehensive cocktail.

In many cases, of course, treatment will bring results. But, isn't it better not to have to resort to medicines in the first place?

WHICH IS WORSE, THE CURE OR THE DISEASE?

I am sure that we all know at least one person who responds badly to some forms of treatment. Such people often feel worse during and after treatment than they would have done had the disease been allowed to run its natural course. As we know, it is this that has given rise to the addage of "the cure being worse than the disease itself".

The same could be said of fish, of course. I have lost count of the number of letters that I have received over the years from new aquarists who are puzzled when they discover that their newly-bought fish have succumbed to disease even though the tank was treated with medicines for White Spot, Fungus, Flukes . . . and so on, at the same time that the fish were introduced!

It worries me to see that these aquarists don't realise that what they are doing is the equivalent of dosing themselves up to the eyeballs with cough mixtures, aspirins, diarrhoea tablets, or whatever, without even stopping to think if they actually need any of these medicines in the first place.

The truth of the matter is that, by interfering too much with an aquatic system, we can easily upset things to such an extent that previously healthy fish will begin to go downhill and will soon succumb to disease and, perhaps, even die. Had they been left alone, they would, almost certainly, have stood a better chance of remaining healthy.

Healthy fish, whatever the species (this is a Toadfish, *Riekertia ellisi*), can only remain so as long as they, their environment, and the disease-causing organisms that live in it, are in equilibrium.

Surface Dimensions (in)	MAXIMUM NO. OF FISH						
	Tropical Freshwater			Coldwater		Tropical Marine	
Length/Width	Up to 2in	2-3in	3-4in	2-3in	3-4in	(2in)*	(2in)**
18 x 10	14	10	N/R	3	2	N/R	N/R
24 x 12	22	16	14	5	3	3	6
36 x 12	33	24	21	7	5	4	9
48 x 12	44	32	29	10	7	6	12
60 x 18	83	60	54	18	13	11	22
72 x 18	100	72	65	22	15	14	28

* = *Number of marine fish recommended for a new tank.*
** = *Number of marine fish recommended for an established tank, i.e. one more than six months old.*
N/R = Not recommended.

THE POSITIVE APPROACH

The positive approach to fish health is very different to the reactive one. Instead of resorting to medicines from the word go, or doing nothing at all until something develops and then treating it, it relies heavily on *preventing* conditions from deteriorating to the point that treatment becomes necessary.

The formula is not foolproof, of course, but it does go a long way towards maintaining one's fish in a healthy state. At least, using the preventative approach reduces the quantity of medicines that fish would otherwise be routinely subjected to. If, despite one's best efforts, disease *does* break out, then suitable treatment should, obviously, be provided as soon as possible (see other articles on this subject in this issue of *Aquarist & Pondkeeper*).

FIRST REQUIREMENTS

A healthy fish is a joy to watch, while an unhealthy one is, at best, distressing. Much of the art of fishkeeping lies in an ability to maintain the balance tilted firmly in favour of the "joyful" end of the spectrum.

In order to do this, one of the first requirements is an understanding of the reasons *why* fish succumb to disease. Such an appreciation enhances a fish's chances of experiencing good health and, consequently, contributes significantly to our own enjoyment at seeing them healthy.

The secret of success starts, quite naturally, with the water itself. Yet, water is just one of three main factors responsible for the state of health of a fish. The other two are the fish itself and the pathogenic (disease-causing) agents which are always present in the water.

As long as all three components are in equilibrium, a fish will remain healthy. However, tip any of these factors "over the edge" and you've got problems.

For example, lower a fish's resistance through improper feeding and it is likely to go down with something. Similarly, keep hardwater species, e.g. African Rift Lake Cichlids, in excessively soft, acid water, and they won't last long in peak condition. Stimulate the proliferation of pathogenic bacteria by leaving a dead fish in a tank overnight and, again, you could easily be courting disaster.

SOME PREVENTATIVE MEASURES

Balance is, clearly, a key factor in fish health. One of the best ways of ensuring that the scales are tipped in the right direction from the outset is to take certain steps which will not force an aquatic system beyond its limits. If we demand something which is beyond the capabilities of our system, then we have only ourselves to blame when things go wrong. Here are a few suggestions which I have found very useful over the years, and to which I always adhere:

1. Treat any newly set up tank (filled with water from the **cold** tap) with dechlorinators and water conditioners.
2. Run a new system for, at least, several days (preferably a week), making adjustments to heating, lighting and filtration systems as necessary.
3. Buy quarantined stocks of fish. Failing this, or in addition, quarantine all fish for a minimum of one week. Do not introduce inadequately quarantined new fish into an established set-up and only introduce small numbers of fish at any one time.
4. Buy only active, full-bodied, alert-looking fish.
5. Protect them against temperature and travel stress on the way home by carrying them in an insulated, darkened container.
6. Switch lights off and float the bag containing the fish in the tank for 10 to 20 minutes until temperatures equilibrate.
7. Untie (do *not* pop) the bag and mix in a small amount of tank water with that in the bag.
8. Repeat steps 6 and 7, at least, twice more.
9. Release the fish gently into the tank.
10. Do not feed — this is best left until the next day. When you *do* feed, little and often is best. Avoid overfeeding at all times.
11. **Under no circumstances** attempt to overstock a tank (see Table).
12. Buy only compatible species.
13. Match fish and water conditions carefully.
14. Check on habits of fish and their diet *before* buying them and make sure that you can make adequate provision for their needs. If you can't, don't buy the fish.
15. Check, at least, pH and nitrites regularly and carry out necessary adjustments.
16. Carry our partial water changes (approximately 20%) every 10-14 days in established freshwater aquaria and once a month in marine set-ups.
17. Carry out regular equipment checks.
18. Stock up with a good selection of remedies and spare equipment to allow you to respond to emergencies without delay.
19. Never allow yourself to become complacent. It is far easier to keep things within safe limits through regular attention than have to rectify major imbalances brought about through neglect.
20. Never, *but never*, be afraid to ask for help. You may be a very experienced aquarist, but if you have not kept a particular species before, you are unlikely to be better informed about it than someone who has kept, or bred it, particularly someone who has experienced problems and has overcome them.

SIX OF THE WORST

Some of the most common fish diseases can be easily diagnosed by most aquarists. **Dr. Chris Andrews** groups the ones most likely to occur in freshwater and marine aquaria and outlines suitable courses of treatment.

Fish can suffer from a huge range of infectious diseases, yet perhaps just a handful of these account for the majority of disease problems encountered by aquarists. Prompt diagnosis and effective treatment of these common diseases is well within the capabilities of most hobbyists — often using available, proprietary treatments. What is often forgotten, however, is that most diseases can actually be *prevented*, by a combination of *quarantine* of all new stock, and *correct care* of the aquarium or pond.

DISEASE PREVENTION

A small aquarium, baby bath or paddling pool can be used as a quarantine (and when necessary, treatment) tank. This should be aerated (and preferably filtered), and heated if it is for tropical fish. Some form of refuge (eg: flower pot, plastic plant) should be provided for timid fish, and all new fish so quarantined for one or two weeks, at least. A preventative course of treatment with a White-spot remedy (in freshwater) and a copper-based remedy (in seawater) is also a good idea.

Furthermore, the importance of correct care in preventing any fish diseases should not be overlooked. Most of the organisms responsible for the common diseases of fish occur widely as environmental 'contaminants' or 'latent' infections in apparently healthy fish. If the fish are subjected to less than ideal pond or aquarium conditions, this will be sufficient to trigger off the disease organism(s), with the infection moving from a latent to an active condition. Therefore, outbreaks of a disease are an almost invariable indication that something is wrong with the basic pond or aquarium set-up, including overcrowding, incorrect diet, poor filtration, inadequate water changes, poor or fluctuating water conditions, and so on. Such factors must be identified and improved for long-term disease prevention.

1. WHITE-SPOT AND FRIENDS

The most ubiquitous of fish diseases is surely White-spot, as caused by the ciliate protozoan *Ichthyophthirius multifiliis* (and

CHRIS ANDREWS

The White-spot parasite at it appears under the microscope.

hence its other common name 'Ich'). The 'Ich' parasite lives on the skin, fins and gills of fish (both tropical *and* coldwater), but must fall away from the host to divide. On the aquarium or pond floor, many hundreds of daughter parasites, or 'swarmers' are produced, which then reinfect the same fish or other fish in the same aquarium or pond. The life cycle can turn over in 3 or 4 days at 24°C, and can therefore rapidly build up to epizootic proportions in a well-stocked tropical aquarium, or in a coldwater aquarium or pond in the summer. Conversely, the parasite can lie dormant on the host for weeks at temperatures below 10°C, suddenly causing a problem when temperatures increase. Since the White-spot parasite is situated under the skin of the host, it is only susceptible to treatment once it falls away to divide. Hence, treatments must be added to the infected tank or pond, rather than removing the fish to a separate treatment tank. Fortunately, there are a number of excellent White-spot treatments on the market, and **WS3** (by **King British**) seems to have received the seal of approval of many hobbyists.

In marine tanks, a similar parasite by the name *Cryptocaryon irritans* occurs, and causes similar problems. This is best treated with one of the available copper-based remedies, noting that such treatments cannot be used in the presence of invertebrates.

Heavy infestations with a range of tiny parasites such as *Chilodonella*, *Costia*, Trichodinids, *Gyrodactylus* and *Dactylogyrus* irritate the skin of fish and clog their gills, causing a range of symptoms including rubbing against rocks, excess mucus on the skin, and rapid gill movements. These parasites may occur with 'Ich', and are particularly common on newly-imported fish or coldwater fish in the spring. Fortunately, effective treatment is possible with anti-white-spot remedies, or remedies such as **Sterazin** (by **Waterlife Research**).

2. FISH FUNGUS

Fish Fungus (as caused by fungi such as *Saprolegnia* and *Achyla*)is a very common disease, especially on fish that are in poor

THE MOST COMMON FISH DISEASES

Symptoms	Disease	Treatment
White 'salt-grains' on skin and fins; rubbing against rocks.	White-spot *(Ichthyophthirius)*	Add a proprietary brand of White-spot treatment to the affected pond or tank; quarantine new stock.
Off-white or brown patches of 'cotton wool' on skin and fins.	Fungus *(Saprolegnia Achyla)*	Add fungal treatment to the tank or pond; check environmental conditions.
Split or ragged fins; reddening at fin bases.	Fin Rot (caused by a localised bacterial infection).	Add proprietary treatment to the tank or pond, or isolate and use antibiotics under veterinary guidance; check general conditions in pond or aquarium.
Raised boils or ulcers on body or head.	'Hole-in-the-body' Disease (caused by a bacterium).	Isolate affected fish and treat with antibiotics under veterinary guidance; check tank or pond conditions.
Obvious, mobile 'lice' on skin and fins, and in water.	Fish Louse *(Argulus)*	Add proprietary treatment to pond or aquarium; check treatment for 'sensitive' species.
Yellow-off-white 'dusting' on skin and fins; increased gill movements.	Velvet Disease *(Oodinium)*.	Add proprietary treatment to aquarium; watch for 'sensitive' marine invertebrates; quarantine all new stock.


CHRIS ANDREWS

Roach heavily infested with Fungus.

condition because of fighting, rough handling, recent spawning activity, and, perhaps, unsatisfactory tank conditions. Since the 'seeds' or spores which give rise to Fungus are very common in water, Fungus is a continued threat to fish. However, if spotted early enough it can be effectively treated by adding a proprietary remedy to the aquarium or pond, and subsequently prevented by correct care.

3. FIN ROT

Fin Rot is a common problem among newly-imported fish, or fish which have been fighting or kept in unhygienic conditions. It is usually related to a localised bacterial infection, which can have serious consequences if not promptly treated. Acriflavine-based (eg: **General Tonic** by **Tetra**) or phenoxethol-based (eg: **Liquitox**, by **Interpet**) treatments are recommended, although antibiotic treatment (with the help of a vet's prescription) is a possibility for stubborn cases. Of course, the problem is likely to recur if the underlying causes are not eliminated.


CHRIS ANDREWS

Hole-in-the-body is both unsightly and dangerous.

4. HOLE-IN-THE-BODY DISEASE

This disease (which should not be confused with 'Hole-in-the-head' disease of cichlids) is most common amongst coldwater fish such as Koi and Goldfish, and is usually the result of a bacterial infection. However, the bacterium that is responsible for the disease (often an Aeromonad) is quite common but, like so many other fish diseases, can only cause problems in already weakened hosts. The stress resulting from importation, rough handling, overcrowding and poor water conditions are all predisposing factors for this disease, and therein lies the long-term prevention of this problem. When an outbreak of 'Hole-in-the-body' disease occurs, antibiotic treatment is the only real option. **King British** produce an antibiotic-medicated flake food, or antibiotics like **Teramycan** (eg: **Pfizer**) can be injected or added to the water of a treatment tank. Whichever method is chosen, veterinary assistance will be required. Because fish showing symptoms of this disease are actively shedding large numbers of bacteria into the water, isolation is recommended.

IMPORTANT POINTS TO NOTE WHEN TREATING FISH

- Calculate volume of any tanks or ponds carefully. Length × height × width (all cm), divided by 1000 = volume in litres. Deduct 10% from this for gravel, etc. (if present).
- Turn off filtration over activated carbon during treatment. Ensure adequate aeration.
- Do not overcrowd fish during treatment or treat in galvanised containers.
- Always try a remedy out on one or two individuals before treating a whole batch of delicate or expensive fish.
- Excessive organic matter will reduce the activity of most remedies.
- Never mix remedies unless you know it is safe. A 50-75% water change and filtration over activated carbon for 12-24 hours should remove most active ingredients.
- Treat marine fish in a separate tank unless you know the remedy will not harm the undergravel filter and the invertebrates.
- If you are in any doubt about the diagnosis and treatment of a disease of your fish, contact a local vet or fish health specialist.
- If possible, use a reliable proprietary treatment — rather than a home-made remedy — following the instructions for use carefully.

5. FISH LICE

The Fish Louse (*Argulus*) is a half centimetre-sized crustacean parasite which is especially common on pond fish during the summer and early autumn. It has piercing mouthparts which intensely irritate the host, and it feeds on the blood and tissue fluids of fish. The wounds made by *Argulus* may also become infected with bacteria and fungus.

Fortunately, this disease is easily treated using **Sterazin** (by **Waterlife Research**). However, some fish (eg: Orfe, Rudd) are rather sensitive to **Sterazin**, and they should be maintained in a separate tank for 7-10 days, while the infected tank or pond is treated. An alternative treatment (**Naled EC** from **Kyldane**) is said to be just as effective, but safer to use.

6. VELVET DISEASE

Velvet Disease is caused by a number of different species of *Oodinium* parasites, and although it occurs in freshwater, it is a particularly serious disease in marine tanks. It may occur as a skin and/or gill infestation, and at the temperatures in most tropical marine systems, can have sudden and quite drastic effects. A copper-based treatment, such as **'Aquarian' Coppersafe** (perhaps used in conjunction with a short freshwater dip) is the best remedy for an existing problem. As indicated above, copper cannot be used when invertebrates are present, and


J.C. CHUBB

This White Cloud Mountain Minnow is very badly infected with Velvet.

the value of quarantine and a prophylatic copper treatment to prevent the introduction of *Oodinium* (and *Cryptocaryon*) to mixed fish-invertebrate systems have been mentioned.

Where Velvet Disease occurs in freshwater aquaria, proprietary White-spot (or Velvet) remedies can be used.

FURTHER INFORMATION

In addition to a number of excellent fish disease treatments which are now available, aquarists can also turn to one or two excellent and easy-to-use books on fish disease diagnosis and control.

These include:

'A Fishkeeper's Guide to maintaining a Healthy Aquarium' by Dr. Neville Carrington (Salamander), £4.95.

CASEBOOK

Jerzy Gawor of Aquality Ltd. takes a refreshingly different look at fish health problems in the first case study of a new occasional series.

DATE: 26th October 1984
CLIENT: Mr R.H.
CASE NO: 0841026
SPECIMENS: 100ml Aquarium water; 6 assorted Tropical Community Fish.

BACKGROUND:

Mr H had phoned our laboratory and asked for advice regarding fish losses in a 48in, 30-gallon tropical freshwater aquarium that he had recently purchased. His description of the system showed that good quality equipment had been used throughout including twin fluorescent lighting, combined heater-thermostat, a deluxe all-glass aquarium with built-in glass hood, a large external power filter, plenty of gravel, rocks and plants. He allowed two days for the system to settle in before going back to the aquatic shop for his fish. Within an hour he had emerged with a box of sixty mixed tropical freshwater fish and had immediately returned home to put them in his aquarium. As the fish seemed hungry, three to four feeds were being administered daily. All seemed well for the first seven days, and then, for no reason, fish started to die.

The first to go were six Cardinal Tetras, followed by two of the eight *Corydoras* catfish. The Guppies were beginning to lose their tails and other members of this new community were gulping at the water surface and showing symptoms of Fungus. By the tenth day seventeen fish had been lost and it was at this point that Mr H contacted us.

Having listened to a brief description of the problem I asked Mr H to bring a 100ml sample of aquarium water and some specimens of affected fish to our diagnostic laboratory, as soon as possible.

On arrival and introduction I asked Mr H to fill in one of our standard Laboratory Questionnaires. These have been designed to provide as much background information on the particular problem as possible. Typical questions asked are size of system/numbers of fish/types of filters/frequency of partial water changes/type of food/frequency of feeding/use of medications/typical symptoms . . .

Armed with this information and the samples Mr H had brought in, I would spend some time conducting my investigations as to why the aquarium system had gone wroeng. Mr H was asked to return 24 hours later for a full report on my observations, and advice on remedial procedures.

JERZY GAWOR

JERZY GAWOR

Top, normal gill tissue from a Goldfish specimen (magnified 40 times) shows primary Lamellae, the fern-like fronds, and secondary Lamellae, the lateral lines on each frond.
Above, the gill section showing progresaive degeneration, Lamellar Hypertrophy and some Hyperplasia on secondary Lamellae (this shot is of a Koi specimen).

LABORATORY ANALYSIS

1. **Water Sample:**

pH	: 7.90
Total hardness	: 190.00 mg/L (as $CaCo_3$)
Total ammonia	: 3.50 mg/L
Nitrite	: 0.10 mg/L
Nitrate	: 5.00 mg/L
Copper	: 0.15 mg/L
Temperature	: 78°F

2. **Fish Samples:**
Several samples of fish had been supplied. There were six assorted tetras wrapped in silver foil that had died two days earlier and had been frozen. NB **Regrettably, it is not possible to conduct a post-mortem on a frozen specimen.** All the parameters that I look for . . . signs of external/internal pathogens, changes in skin/gill and other

organ structure, are all destroyed/masked by the freezing-thawing process.

Fortunately, two Guppies that had died earlier that day and three Swordtails (still alive in a small plastic bag of water) had been supplied as well.

Mr H had also heeded my advice and brought a separate sample of water from the aquarium. It is best to analyse water samples that have not been contaminated by live or dead fish, often transported to the laboratory in the same container.

External observation showed the Swordtails to be gasping heavily at the water surface. Excessive 'mucus' (Fungus?) was also seen in and around the gill cavities. Skin scrapings from the Guppy samples were mounted on microscope slides and scanned at low power (x 40-100) magnification. No external protozoal (eg Ich — White Spot — *Costia, Trichodina*) or monogenetic trematode (eg Skin and Gill Fluke) parasites were observed. The 'mucus' and one or two scales were gently removed from one of the Swordtails and mounted on a microscope slide. A scan at low power showed absence of parasites and confirmed that the 'mucus' was in fact mucus, and not a true fungus.

Sections of gill filaments removed from the Guppy specimen were found to be very anaemic. These were mounted on a microscope slide and scanned at lower power. One or two gill flukes (*Dactylogyrus sp.*) were observed but not in significant numbers.

What was found to be significant was the amount of gill damage. The ends of the delicate gill filaments were 'clubbed' and there was much hyperplastic cell proliferation (excessive growth of cells). A check on the gills of one of the Swordtails that by now had also died, confirmed this situation.

Internal observation of the specimens showed normal organ structure and morphology. No further investigations were conducted.

CONCLUSION & DIAGNOSIS

In view of the low numbers of parasites found, these were ruled out as the cause of the fatalities. The level of gill damage found was, however, very significant. It was almost certainly the main, if not only, cause of fish losses. Gill filament clubbing and hyperplasia occur when these delicate tissues are exposed to toxic levels of organic or other pollutants. In this particular case, if you look at the water analysis figures, the ammonia level stands out significantly. At this level and at the pH and temperature observed, un-ionised ammonia (NH_3) would cause the damage. Furthermore, a look at the copper level also showed this to be significant. Copper is a heavy metal, toxic to fish even at low concentrations, and combined with the ammonia level, it was little wonder that so many fish had been lost.

RECOMMENDATIONS

My immediate suggestions were as follows:

1. Conduct daily 30% partial water changes over the next six days in an effort to dilute out the offending ammonia problem.
2. Cut food down to one feed daily.
3. Carry out a 30% partial water change weekly for the next 5 weeks.
4. Add an ammonia-absorbing product to the power-filter, and use of a spray-bar or Venturi on the outlet to increase aeration.
5. Use a water conditioner when conducting water changes to 'remove' toxic copper, and use water from the rising main cold tap only — NEVER from the hot water system (as had been used in this particular case).
6. Add a proprietary anti-fluke remedy after 10 days to prevent any further spread of Gill Flukes.

Mr H reported back to the laboratory after two weeks and, although six more fish had been lost, probably as a result of irreparable gill damage, the situation had levelled out and everything was progressing normally. Fish that had frayed tails were regenerating them and no more 'mucus' was evident.

PREVENTATIVE MEASURES

I would like to stress a few of the main points in this case so that, hopefully, other aquarists can avoid this problem, commonly termed the "New Tank Syndrome". Read, also, John Dawes' article "The positive appeoach to fish health" in this issue of *A+P*.

1. Never purchase a great quantity of fish at once, especially when setting up a new system. You will overload the capabilities of the filters and allow high ammonia (fish waste) levels to build up with resultant damage and stress to the fish. A tank needs time to settle down, so allow a week to ten days between additions of quarantined fish.
2. Do not overfeed a new system. In fact, *never* overfeed. Excess food = pollution = problems.
3. Never use water from the hot-water supply. This invariably contains high copper levels (especially if copper hot-water cylinders are used) which are lethal to fish. Water conditioners will be found very helpful in neutralising some dangerous chemicals and should be used.
4. During the first 5-6 weeks, ammonia levels reach a peak before the filters become fully functional. Regular partial dilution is the key to success, even after the initial settling down period, but during the early stages, as much as 30% weekly water changes will be of immense help. Later, fortnightly (or so) partial changes should suffice.

POSTSCRIPT: A Happy Ending

Mr H has recently purchased another aquarium, is a regular face seen at our retail showroom, and has become a very keen aquarist.

JOHN DAWES

Our first sunset had us all absolutely spellbound.

THE AMAZON EXPERIENCE

PART I

Truly unforgettable, exciting, unbelievably beautiful and unique — Piranha, Discus, Cardinals, Caymans, Montezuma and all. That's how **John Dawes** feels about the recent expedition to the awe-inspiring Amazonas region of Brazil organised by **Ornamental Fish International.**

Below Right: Four intrepid explorers with our infallible guide, Silas, who seemed to know every single creek by heart. Front: Peter Golding (Peter Golding Ltd. — Promin) and Keith Barraclough (King British). With me in the back row is Eddie Pillinger (Water World) who will long remember his "close encounter" with a Black Piranha. (Photo: Courtesy of Peter Golding Ltd.) Bottom right, the mammoth moth. Below left, beginners' luck! Our first fish was this fantastic Blue-faced Heckel.

JOHN DAWES

JOHN DAWES

You read about it, you hear about it, you see it on film time after time, after time. Yet nothing, but *nothing*, can prepare you for the mindblowing beauty and awesome size of the Amazon.

We started our trip up the Rio Negro, one of the two major tributaries of the Amazon, at Manaus, the old rubber boom capital of Brazil, situated at the junction between the Rio Negro itself and the other major Amazonian tributary, the Rio Solimoes.

I used the word "tributary" only because, technically, I suppose that's what these two rivers are. Yet, when you talk about a tributary being *seven* miles wide — that's some tributary! And if that isn't enough, it's worth noting in passing, that Manaus is 1000 miles upriver from the mouth of the Amazon.

Here's another "statistic". On the first morning, travelling at appeoximately 10 knots, we took about two hours to sail past the first of the 300 islands which make up the Anavilhanas Archipelago. Just think about it — a 20-mile long island in the middle of, not a sea, but a *river*.

We were aiming for one of several main Discus and Cardinal collecting areas about 1½ days' solid sailing up the Rio Negro. In the meantime, though, we had plenty of time to take in the view — River Dolphins (known locally as Boutus), Green Amazonian Parrots, impenetrable jungle — the lot.

To cap it all, the first sunset was out of this world. It could have had something to do with the pure, unpolluted, intoxicating air, or the swish of the water as we ploughed through it, or the excitement of anticipation, or the mere fact that we were just wallowing in the smug feeling of being "where it's at" — I don't know. I just know that sunset brought us all out on the top decks of our two river cruisers, uttering all manner of totally unnecessary superlatives, and clicking with our cameras for all we were worth.

The First Night

That night, at about 11 o'clock, we stopped at a Discus collecting station. It appeared totally deserted. In fact, it took us a full 20 minutes to elicit any response at all. Of course, this is hardly surprising. I don't think I would be too keen to show myself if *I* were left alone guarding a collecting station somewhere up the Amazon and two river boats, armed with searchlights, came up to my door in the middle of the night. Would *you*?

It transpired that all the fishermen were out collecting Discus in a lagoon some "twenty minutes" upriver (everything is measured in time, not distance, on the river). That was all the encouragement we needed.

We poured into our fleet of small motorised boats and set off to look for them. Within minutes we met up with them — on their way back from a successful night's fishing. After the most incredible mid-river negotiating session in English, pigeon Portuguese and everything else in between, we managed to reach agreement and a number of fishermen led us back to the collecting site.

Beginners' Luck

What followed was about the most exciting "fishy" experience I have ever had. And judging by the reaction of the others on my boat, Keith Barraclough of King British and other OFI members, I was not alone.

It's difficult to describe the feeling of being in an Amazonian lagoon at midnight, on a still, warm moonlit night with insects and frogs chirping and croaking all around you, fishing for Discus with waterproof torches and short-handled fish nets. It's difficult to describe, but it's oh-so-easy to feel that tingling sensation all over again!

As luck would have it, our very first fish was a massive Blue-faced Heckel Discus. We couldn't believe our eyes. It was a magnificent sight — a full seven inches across, with brilliant markings that I, for one, had only ever seen in books.

Two weeks later, and half a world away, some of these Blue-faced Heckels made their first appearance in the UK on the King British stand at the British Aquarist Festival held at Belle Vue. The remarkable thing was that they were swimming around in the tank with a shoal of domesticated Discus, showing off as if they had been born and reared in an aquarium instead of an Amazonian lagoon thousands of miles from Manchester.

A Puzzling Problem

Every once in a while, nature throws up a question which is very difficult to explain away. In the case of the Discus we caught, it is a particularly puzzling problem.

Of all the specimens we, and all the other fishing parties, collected, only 25-30% were in perfect condition. The remainder all had bacterial infections of the fins. I couldn't understand this at the time — I still can't now.

Had the other species we caught been similarly affected, things might have been a little easier to grasp. But they were not. We caught *Geophagus jurupari*, *Mesonauta festivus* (Festive Cichlids) and *Heros (Cichlasoma) coryphaenoides* (Chocolate Cichlids) and they were all perfect in every single detail. Why, therefore, were the Discus affected? Any suggestions would be most gratefully received.

Montezuma's Arrival

At 3.30 a.m., Montezuma struck — and how! For the rest of the trip, "Sorry — can't stop — must run!" took on a very literal meaning indeed.

This, of course, is one of the hazards you must expect to come up against whenever you embark on expeditions to far-off places. It never fails — but it never puts you off either.

It is a well-known fact, is it not, that we, fishkeepers, are all just a little bit crazy? And why not? The rewards are well worth the discomfort.

And when those rewards include night fishing for Discus, plus the prospect of going for Cardinals and, perhaps, catching a few Piranha and Caymans (Amazon Alligators) as well — there can be no doubt at all in anybody's mind.

In our case, morning found nearly three-quarters of the 29-strong party playing host to Mr Montezuma — a close relationship we were to maintain for nearly a week. It was just as well that we spent the whole of the following day steaming upriver towards our final destination. At least, it gave us a bit of breathing space and allowed us to come to grips with the situation — some of us more effectively than others.

The Mammoth Moth

To me, the highlight of the day (the only one) came late that night when we stopped to refuel at Barcelos, a once-thriving but today, sadly, lapsed community.

Most of us went ashore to stretch our legs and, generally, have a look round. I decided to go off with our resident butterfly/moth fanatic, Rick Gibson from Tampa, and the OFI contingent from Northern Ireland.

The place was humming with moths of every conceivable shape and colour. Rick, of course, was delighted. So was I — my love of moths and butterflies goes back to the days when, as a six/seven-year-old, I used to rear silkmoths on mulberry leaves and lettuce (but that's another story, as they say).

Anyway, that night, we caught a huge specimen of *Thysania agrippina*, the world's largest, moth, and one of the rarest in South America. I say "we" but, in fact, it was a local resident who caught the moth for us after we had disturbed it and it had flown into his front room. The chase, to say the least, was extremely noisy and hilarious yet, unbelievably, the moth was ultimately captured in mint condition. Rick was speechless — we were not far behind.

This is one of the great and unpredictable bonuses of every fish collecting trip. You start off with fish foremost in your mind and end up with a host of other unforgettable memories as well.

All this, and we were not even halfway through our trip. The Cardinals, Piranha, Cichlids, Pencilfishes, Tetras, Catfish, Caymans, and all the rest, were waiting just the other side of daybreak — but we didn't know that at the time.

SEE YOU IN PART 2!

★ This expedition to the Amazon formed part of a 16-day venture organised by **Ornamental Fish International** to coincide with one of their regular meetings (held, on this occasion, in Miami).

OFI is a worldwide organisation representing wholesalers, importers, exporters, breeders and manufacturers concerned with ornamental fish, water plants and aquatic equipment. Among their main aims are the promotion of the hobby throughout the world, and research into the most humane and efficient methods of transporting and handling fish, both nationally and internationally. For further details, contact **Mr R. Rushton, OFI Secretariat, 4th Floor, Onslow House, 60-66 Saffron Hill, London ECIN 8QX.**

GET THEM OFF — TO A GOOD START

By
Dick Mills

While the feeding of the five thousand was not quite what you had in mind when you started breeding fishes, there are times when it feels like it! Just as annoying, is that unexpected spawning (usually over a Public Holiday) that catches you in an Old Mother Hubbard stage with nothing to feed the newcomers. Faced with these problems, you will be relieved to know that there is a wide range of suitable foods available. Food for fry comes in many forms: live foods, prepared foods, D-I-Y foods and so on.

Gone are the days when it was a case of pouring boiling water on to some vegetation of some description (chopped hay and banana skins were favourite recommendations I seem to remember) and then it was a waiting game to see what resulted — usually a peculiar smell and banishment from the kitchen! It is also no longer necessary to provide screened live aquatic foods with their possibly attendant diseases.

PREPARED FOODS

By far the easiest and most convenient method of fry feeding is to use the now commonly available forms of the popular 'staple' dry foods. Some aquarists merely pulverise flake foods down to a suitable size, although the fish nutritionalists will quickly point out that there is a big difference between the needs of a very young fish and that of a more mature specimen of the same species. In the following, protein percentages are given as a guide only; it must be borne in mind that these figures are not necessarily all calculated by the same method and the protein figure should not be regarded as the sole criterion when evaluating foods.

The **Aquarian** range of foods includes *Fry Food* and, a logical follow-up, *Growth Food*, both not only suitably graded for easy eating by the fish but also enriched with extra proteins (38% for *Fry Food*, 37% for *Growth Food*, as against 36% for normal Flake) vitally necessary at these early stages of the fish's lifespan.

Interpet has long been associated with fry foods. In fact, it was the now world-famous *Liquifry* that helped establish the Company's reputation as a quality aquatic manufacturer. The red and green tubed liquid foods (No.1, Red, for Egglayers and No.2, Green, for Livebearers) have been joined by *Liquifry Marine* (ideal for invertebrate feeding), and they continue to remain the traditional starters for the tiniest of fry. Also from **Interpet** is *BIOL*, a plankton-based first food. Although, at first sight, it appears to be too large for fry, it does encourage natural "infusoria" to develop in the aquarium for the benefit of fry.

King British has new products which, while not aimed specifically at fry as consumers, nevertheless, can be used in this context. *Fish Treats* come in 11 'flavours' (some in Tablet Form). Perhaps the *'General'*, and *'Plant & Vegetable'* forms are most suitable for fry food. The flat-sided tablets are easily stuck to the inside glass and slowly disintegrate over a period of time. Unfortunately, the equally-suitable *'Plankton'* form has a convex surface which makes glass-adhesion practically impossible.

Liquid Del is a range of tubed liquid foods from Germany. Four different types — *Plant-based (Chlorophyll)*, *Brine Shrimp*, *Plankton/Colour* and *Multimix* — provide a variation for fry, ensuring that they get the best selection of necessary foods. They are also a convenient form of food for marine invertebrate filter feeders (turn off power filters when feeding).

Nutrafin *Growth Food* clocks up 48% on the protein count and is a miniature flake food.

Promin is a well-known, respected granular food and, for fry and young fish, use it is supplied in a *'Fine'* grade. The protein figure is a staggering 54%.

Sera is a popular West German food and their product for young fish is called *Micropan*. It is also a miniature flake food, smaller than Nutrafin, and has a 45% protein level.

Tetra market *Baby Fish Foods* in two separate forms — *'E'* and *'L'* — for Egglayers and Livebearer fry respectively. They also follow this up with *Growth Food* (protein score: E = 45%, L = 42%, Growth Food = 47%).

Rotifers are the latest fry livefoods to appear as culture kits in the UK.

Cultured Live Foods

Members of the Enchytraeidae, such as Whiteworm and Grindalworm, are firm favourites as hobbyist-cultured terrestrial live foods for young fish, as are Microworms and Wingless Fruit-flies *(Drosophila melanogaster)*.

Brine Shrimp *(Artemia salina)* needs no introduction as an excellent fry food. Culturing the dormant eggs (shelled or shell-less) is simplicity itself especially if you use the special hatchers now available from **New Technology, Hobby and Hykro.** *Hobby-Liquizell* and *Hobby-Microzell* are but two special foods available with which you can grow on Brine Shrimp to larger sizes, or use to feed invertebrates.

Recently, there has been an introduction of new live foods that may well rival the established live fry foods. Fishes in the wild necessarily live on aquatic life of all sizes, and whilst the larger life-forms have been captured and freeze-dried (or otherwise preserved) for the benefit of species in captivity, it has not been possible, until now, to make use of animals at the other end of the size spectrum. Many fry need very small particle-sized foods at first (some Dwarf Gourami fry I had did best with a starting diet of green water). One good thing about minute live aquatic foods is that they will not pollute the aquarium and, in a reasonably-sized, sparsely-populated, fry-rearing tank, it is unlikely that they will compete with the fry for swimming room or oxygen. This can be important should you feed too early, before the fry have finished absorbing their yolk-sacs and are ready to hunt food for themselves.

Resting Rotifers, developed by Florida Aqua Farms and distributed in the UK, by **Underworld,** is a name to look out for. Rotifers are microscopic aquatic animals whose rotating method of propulsion gives them their common name, and are likely to prove invaluable (dare I say revolutionary?) in the rearing of fry. To culture these animals you must first make up a contemporary version of the primaeval swamp *(Micro Algae Disk)* into which you introduce the dormant animals. From then on it's just a question of feeding the culture *(Roti-Rich)*, as they are theoretically self-preserving and only too keen to multiply. The accompanying facts sheet says that the rotifers can be 'hatched' in either fresh or salt water, and the culturing media can also be used as food for marine filter feeders. *Micro Algae Grow* used in conjunction with the Micro Algae Disk will provide all the greenwater (freshwater or marine) you will need to feed filter-feeding invertebrates or even condition the aquarium during partial water changes.

So, what's your excuse for not rearing that bunch of fry?

Starvation cannot be taken as a reason anymore.

SPECIAL PROMOTION

THE LAHAINA STORY

To the traveller, the name LAHAINA (pronounced La-Hi-Na) conjures up white sandy beaches, crystal clear blue water and coral reefs abundant in all forms of marine life. Lahaina is, in fact, the capital of MAUI, one of the Hawaiian islands. Loosely translated it means "unmerciful sun". Having been to the town many times on diving expeditions, Chick Holland, the inventor of the Lahaina systems, thought the name appropriate for his UK home, particularly since his south-facing balcony traps the sun throughout the year. Thus, the name Lahaina was born and is now used for a whole range of "environmental" aquarium systems. In the text that follows, Chick Holland describes the behind-the-scenes story which led to the development of his systems, one of which you can win in our exciting competition.

THE SECRETS OF THE BLACK BOX REVEALED

"During initial advertising of my now patented aquarium system, an all glass aquarium was featured having a black box at one end. Many hundreds of enquiries were received due to the unique benefits of the system and numerous potential customers asked, "What's in the black box?" Well, here's the answer.

My first experience of marine fishkeeping started in 1978 following a business trip to Hawaii. After many hours diving on the reef, my decision was made to embrace the hobby. Having had previous experience of keeping freshwater tropical fish, I assumed that the conversion would be a simple matter.

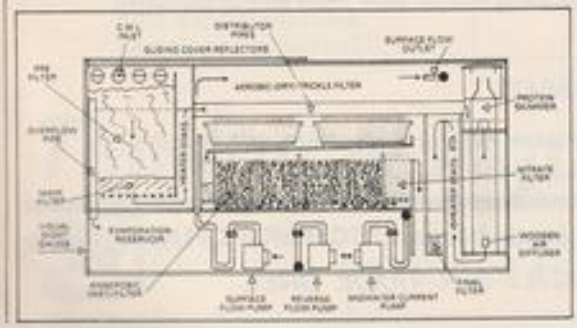
Visits to the local aquarium shops, however, became a nightmare with differing advice and an unsightly cluttered array of pumps, wires, heaters, air stones, uplifts and the like, obscuring the view of my sitting room coral reef and its inhabitants. The noise of air pumps seemed deafening and, for the first time in years, divorce became a distinct possibility!

Many expensive fish were lost, some due to inexperience, but the majority to highly suspect environmental factors.

Advice given by one shop, to the effect that standard undergravel filterplates were useless for keeping marine fish, and that hundreds of additional holes needed to be drilled to enable better water flow, was followed, but within a few days £300 worth of fish had died. Yellow water, and high levels of ammonia and nitrites also resulted. A telephone call to the manufacturers of the filter plates assured me that no extra holes were needed and that many thousands of filters were used in standard form by successful marine enthusiasts. This was the final straw — I determined then to design my own system.

The Lahaina Design

The design features I envisaged at the time are now all incorporated into the Lahaina system and take into account cosmetic appearance, easy maintenance, high water quality and all life support systems, completely hidden from view and easily removable. The pumps used have been chosen for their high water output, reliability and silent running. These factors, together with an easy to "remove, clean and replace" type of fitting, as can be seen in the rear view illustration, make for complete ease of operation. Although water changes are kept to a minimum, it is advisable to test the water regularly and change at least 10% per month to ensure high quality at all times, as there are many changes that occur in an enclosed saltwater aquarium that can alter the chemistry of the water to the detriment of its inhabitants.



The Constant Water Level System

One continuous headache was the constantly falling water level brought about by evaporation. Watching water draining out of rockpools gave me an idea and, after months of experimentation, the C.W.L. (constant water level) system was born. This is one of my main patented features and the effect is caused by the siting of a mechanical pump in a separate reservoir which draws water from the reservoir, forcing it back into the main viewing area under high pressure in the form of sub-gravel, mid-water, or surface currents. The pressurised water in the viewing area, on reaching its predetermined height, flows over a weir and back into the hidden reservoir, passing through mechanical, biological, chemical and nitrate filtration processes on the way. The water is heated and protein skimmed before recirculation back into the main aquarium.

Benefits of the Lahaina System

Many benefits are apparent in the Lahaina system, one important one being the controllable height of the water in the reservoir which, in production models, is easily seen by placing a visual sight gauge within the woodgrain finish. This shows any evaporation, which will *only* occur in the reservoir and *not* in the main viewing area. By topping up the reservoir with fresh water to the top of the Visual Sight Gauge (VSG), specific gravity is always maintained accurately.

All water from the main viewing area in the main aquarium passes through the filtration system many times each hour, depending on the system and the number of pumps used. On flowing *over* the weir, the water passes *down* through the coarse pre-filter and then into the main filter which uses nylon filter wool, the vast majority of suspended particles being trapped at this stage. The water then passes under a separating plate and flows up past heater-stats before entering into distributor pipes. These are situated *above* removable canisters in which various substances can be placed, ie biological granules, coral sand, activated charcoal, etc., and the water trickles through perforations in the distributor pipes into the canisters, thus forming an aerobic (dry) biological filtration environment. In a simple system, this water drips back into the reservoir. In advanced systems, this biologically enriched water drips at a very slow rate into a submerged filter containing biological aggregate ending up with a nitrate-removing substance which changes the nitrate into gas which escapes harmlessly into the atmosphere thus forming an aneaerobic (wet) biological

filtration environment. This water then flows back into the reservoir.

In all systems, excess flow from the distributor pipes passes directly into either a counter-current aeration chamber or an air-stripping protein skimmer before returning through the final filter for recirculation.

Many dissolved organic substances are removed in this manner and this, I feel, is essential for marine fish and invertebrates. Water can also be channelled through ultra-violet sterilisers, algae filters, etc. as required. My system is of modular design which means that the customer can order his/her exact requirements *for today, and in the future, upgrade the system if needed.*

The Tidal System

In normal environmental conditions, during the course of a *lunar* day (24 hours 52 minutes), two high and two low tides occur, with each tide having its own unique ebb and flow currents in addition to a rise and fall in water levels. Many invertebrates and fish rely on changing currents to bring food and plankton within their reach. In a normal aquarium system, this factor is absent.

The *Lahaina variable current system* creates variable ebb and flow currents on a daily, weekly or yearly basis with the *yearly tidal system* authentically reproducing tides with or without a rise/fall in water levels as required. The degree of accuracy would be as that published in the Admiralty tide tables.

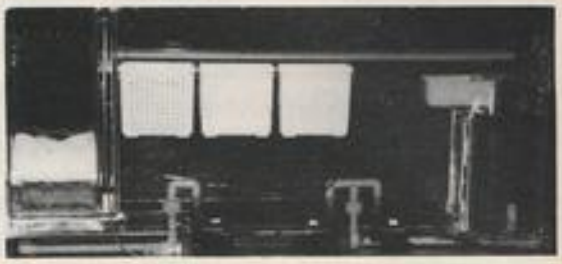
The Surf System

The *Lahaina surf system* can be interlinked with the *tidal system* to give crashing surf at periods of high tide, followed by periods of calm at *slack water high* or *slack water low* corresponding in cessation of ebb and flow currents. This remarkable advance is made possible using a multiple pump system, non-return valves and a purpose designed electronic timing computer programmed on a lunar, not Gregorian, timetable. This advance is already the subject of patent application and will provide the enthusiast with a truly natural environment, with waving corals and sea plants. This, then, is the secret of the **Black Box**, now available to all.

The stands and cabinets we employ are purposed designed and are constructed from *SOLID* oak, elm, mahogany, teak, etc. For the larger sizes of aquariums, where weight is an important consideration, steel supports are inserted using box section-welded construction. These are, naturally, hidden from view.

Hoods and surrounds are also available in matching decor using solid timber of matching wood grain laminates. The variety of styles will suit all tastes. ”

CHICK HOLLAND



WIN A “PERSONALISED” £500 LAHAINA SYSTEM OF YOUR CHOICE

THE LAHAINA COMPETITION

A golden opportunity to start 1987 with a fantastic £500 aquarium system matched to your own personal requirements — just by answering THREE simple questions.

THE PRIZE

- A choice of aquarium: either rectangular (48” x 20” x 20”) or cubic (24” x 24” x 24”).
- Built-in fluorescent lighting.
- Built-in sliding cover reflectors for the lighting unit.
- Choice of filtration system.
- Aerobic and anaerobic filtration facilities.
- Constant Water Level system.
- Protein skimmer for marines, *or*
- Counter-current chamber for freshwater.
- Evaporation chamber with Visual Sight Gauge.
- Pre-filter and main filter on Constant Water Level outlet.
- Powerful current system which eliminates all dead water areas.
- Laminate finish aquarium surround in a choice of colours.

OPTIONAL EXTRAS

These are *not* included in the prize but are available at extra cost:

- Solid wood aquarium surround.
- **Variable Current System** which simulates tidal flow without the rise and fall element.
- Full **Tidal System** — as above, but also incorporates rising and falling water levels.
- **Surf System** which simulates crashing surf conditions.

THE COMPETITION

Read **“The Lahaina Story”** carefully and answer the three questions given below:

1. **What does C.W.L. stand for?**
2. **What is a V.S.G.?**
3. **What does “Lahaina” mean?**

THE RULES

1. **Send your completed entry to reach us by 31 January 1987 at the very latest.**
2. **Make sure that you write your full name and address in BLOCK CAPITALS on your entry.**
3. **Send your set of answers to: *Aquarist & Pondkeeper*, (LAHAINA COMPETITION), 58 Fleet Street, London EC4Y 1JU.**
4. **Look out for the name of the lucky winner in the March issue of the *Aquarist & Pondkeeper*.**
5. **This competition is open to UK residents, except employees of Buckley Press, “Lahaina”, and their immediate relatives.**

Helping hand

The versatile Aquaclear Powerhead from Hagen

Any piece of aquarium equipment that can be adapted to several uses and which, at the same time, is easy to install and manipulate, is of tremendous benefit to disabled aquarists, particularly those on reduced income.

The **Aquaclear Powerhead** from Hagen is a very good example of just such a piece of equipment.

It is extremely easy to install, is very efficient at maintaining clean water conditions, can be easily adjusted by means of a little lever situated under the unit, and has a Venturi attachment which allows you to aerate the water without having to use an airstone.

The combined benefits of all these features is that I now spend less time than before on aquarium maintenance.

A note of caution though:

If you are converting an air-operated undergravel filter to a power-operated one, it is wise to increase the flowrate gradually over a period of 48-60 hours. I changed over abruptly on one occasion and found that the sudden increase in biological activity upset the bacterial balance of my tank for a while.

In addition to its "normal" uses, I have also been able to use the powerhead to convert a large plastic bottle into a power filter. By turning it upside-down, I have even been able to use it as a surface skimmer.

Top Marks for the Algarde Powercentre

I have long been on the lookout for a "cable tidy" that is ideal for disabled aquarists. The **Algarde Powercentre** fits the bill perfectly.

It has been built with safety and ease of installation in mind — and it looks good, as well. The unit has a mounting plate which can fit onto a wall or, even, the side of an aquarium.

Algarde's latest product, the Powercentre

As always, if you opt for the second arrangement, remember that water and electricity don't mix!

The "centre" itself can be easily removed from the mounting plate, thus making connections both easier and safer than would otherwise be the case. Rocker switches also make the unit ideal for anyone suffering from arm or hand disabilities. The "Power On" signal light is yet another safety feature (no more stripping down to make sure that you have not overlooked some silly little thing) — you know for certain whether the thing is working or not.

If I were to award points, the Powercentre would receive top marks for design and safety.

Access at Shows — The Good News

A surprise letter from fellow *A & P* scribe, John Cuvelier, whose wife is disabled, brought into focus the deep appreciation which one feels for Show organisers who feature the disabled in their plans.

John tells of the pleasure both he and his wife experienced when they attended the "Abergavenny Agricultural Show". Not only did they find that the car park for disabled visitors was right by the main entrance, but the organisers had actually roped off an area in a prime viewing position near the ring specifically for the use of wheelchair-bound spectators. Great news.

John Cuvelier has spent a lifetime working in the water industry. A special interest of his is, not surprisingly, pool filtration. John has offered to help any 'Helping Hand' readers who require advice on pool construction and design for the disabled.

Shop Basements — Insurmountable Barriers

Traders, quite understandably, need to make the best use of the space they have at their disposal.

There are numerous ways in which this can be done and, as I have shown in past editions of 'Helping Hand', simple alterations carried out on existing layouts, bearing the disabled in mind, can often lead to improved trade all-round.

When these considerations form part of a shop's original design, then the greater freedom of movement which the more spacious arrangements provide, can produce even better results.

Obviously, I would like to see *all* traders adopting this approach. However, this is not so, and facilities vary enormously from shop to shop.

For example, some people believe that the best way to make use of a shop basement is to use it for their display tanks. While I agree that this may work well for many customers, it definitely does not for, at least, four "categories" of fishkeepers.

1. Parents with young children in, say, push-chairs normally find this arrangement difficult, or else have to split up, with one adult remaining with the child(ren) upstairs while the other one goes down into the basement to buy the fish.
2. Anyone with even a partial disability in walking will find the stairs difficult or impossible to negotiate.
3. The same, of course, can apply to elderly fishkeepers.
4. For any wheelchair-bound customers, aquaria installed in a basement might just as well be on the moon!

If all shops were like this, then many fishkeepers would suffer. They would also have to look elsewhere for their needs, or give up the hobby altogether.

Percentages *are* important — without adequate ones no shop can survive. However, there are other factors besides percentages and a little thought given to *all* customers, not just able-bodied ones, will make a lot of people very happy. It would also discourage them from going to places like Supermarkets, with their admirable ease of access, for their tubs of fish food.

A Plea to Y.A.F. and B.A.F. Organisers

I hear that both these major festivals will be moving to new venues in 1987. Please don't forget the many disabled fishkeepers who visit your shows every year — or their "carriers", the fighting force behind every wheelchair!

Healthy fishkeeping!

Nick Lushchan

Nick Lushchan

News

New Self-adhesive digital thermometer from E.T.I.

E.T.I. have recently introduced their own version of stick-on thermometer, the 'TEMP-STRIP'.

The TEMPSTRIP takes the form of a horizontal strip measuring 12mm × 100mm and containing a calibrated range of sealed, heat-sensitive elements which change colour at given temperatures. When each segment of the indicator is exposed to heat at its calibrated temperature, it turns green. Since the reaction is fully reversible, each strip can be used over and over again, always giving the same accurate readings.

The strips are self-adhesive and can easily be fixed to clean, grease-free surfaces with light finger pressure. The sensitive elements are encapsulated and are, therefore, impervious to oil, water and steam.

TEMPSTRIP thermometer strips are available in various temperature ranges. However, the standard range is 12°C to 32°C in 2°C increments, with a claimed accuracy of ±1°C.

Prices from £7.60 per pack of ten strips, exclusive of VAT, postage and packing.

Discounts are available for large orders.

For further details, contact **Electronic Temperature Instruments, P.O. Box 81, Worthing, West Sussex, BN13 3PW. Tel: (0903) 202151.**

Water Guardian from Interpet

Most fishes settle down better when they are kept in water conditions bearing some resemblance to their natural habitat. The stress caused through rapid changes in pH levels, or by fish being kept in water of an unsuitable pH, or indeed, by a build-up of toxic ammonia and nitrites and (even) the less toxic nitrates in the water, often allows diseases to take hold.

Most freshwater tropical fishes come from waters which are reasonably soft and have a slightly acid to neutral pH. 'Water Guardian' is a treatment for water which reduces hardness and stabilises pH at about 6.8, while leaving the essential trace elements untouched. 'Water Guardian' is marketed by Interpet in three forms, namely, the **Hobbyist Pack** which consists of a disposal cartridge, together with a starter kit with water test liquids; a pack of six **'Hobbyist' Disposable Cartridges** and the **'Professional' Water Guardian** which is readily recharged at minimal cost.

For further information, contact: **Interpet Ltd., Dorking, Surrey, RH4 3YX. Tel: (0306) 881033.**

A chance to discuss fishkeeping problems with Dr David Pool of the Tetra Information Centre

The Tetra Information Centre regularly deals with over 5000 letters and enquiries a year from fishkeepers in the UK.

Head of the Centre is Dr David Pool, who, together with his team, put at the fishkeepers' disposal all the 36 years' accumulated experience and knowledge of Tetra's Laboratories and Europe's biggest fish breeding centre — West Aquarium.

One very important aspect of Dr David Pool's work at the Tetra Information Centre is visiting aquatic clubs and societies to give presentations about various aspects of fishkeeping and to discuss any fishkeeping problems that club members may have.

Dr Pool's talks are proving very successful and a recent presentation to 150 members of the Northern Section of the British Koi-keeper's Society was independently described as "the best talk we've had in over 10 years".

Dr Pool will be attending the following shows and meetings in the early part of 1987.

Fishkeepers who are unable to attend any of these are invited to drop Dr Pool a line at the Tetra Information Centre in Eastleigh or, in the case of more urgent enquiries, to ring **(0703) 643339** (24 hour answering service).

Tuesday 10 February 1987 — York & District Aquarist Society, commencing 8.00 pm at the New York Club, Blossom Street, York.

Tuesday 17 February 1987 — South Park Aquatic Study Society, commencing 8.00 pm at Wimbledon Community Centre, 28 St George's Road, Wimbledon.

Dr David Pool, Head of the Tetra Information Centre.

Thursday 5 March 1987 — Totton Association of Fish Hobbyists, at the Station Hotel, Totton.

Thursday 19 March 1987 — Bristol Tropical Fish Club. Venue and time to be arranged.

Wednesday 15 April 1987 — West Yorkshire Marine Aquarist's Group. Venue to be arranged.

Sunday 26 April 1987 — Essex Section of the British Koikeeper's Society at North Stifford Village Hall, Nr Grays.

For further details, contact the **Tetra Information Centre, Mitchell House, Southampton Road, Eastleigh, Hants SO5 5RY.**

The new Lotus Water Gardening Manual

Lotus have just produced their 40-page, full colour Water Garden Manual for 1987.

This year's catalogue includes a variety of new products, such as the Malvern, a black PVC pond liner with a 10-year guarantee, a new fountain jet for the Lotus stork ornament, Algizin (A) to complement the already established Algizin (P), artificial water lilies, small handnets and other items. Some established products, such as Pondseal, the liquid plastic treatment for lining new or leaking concrete ponds, have been repackaged. In this case, Pondseal is now available in convenient plastic buckets with carry handles.

Further details of these and other Lotus products can be obtained from their headquarters at **260-300 Berkhampsted Road, Chesham, Bucks., or from Martin Turner on (0296) 625464.**

The Flame Angel is a dramatic-looking species from Hawaii.

DAZZLING DWARFS

Spectacular alternatives to their larger cousins, Dwarf Angels provide colour, hardiness, longevity, and much more besides. **Gordon Kay** presents his own personal selection for the home aquarium.

Walk into any aquarium shop or public display of coralfishes and the first fishes you notice are the big angels. With their fantastic coloration (even in their juvenile forms) and majestic demeanour, they almost knock your eye out! However, their smaller cousins — known as Dwarf Angels — offer the aquarist an equally pleasing range of colours, patterns and interesting behaviour.

They also have the advantages of being smaller, so that they can be housed in more modest accommodation, are cheaper and, by and large, less demanding on the aquarist. So, let's take a look at one or two of the more popular species and their requirements for a long and happy life.

Left, the Coral Beauty is one of the most widely available Dwarf Angels. Right, *C. bicolor* is my favourite Dwarf Angel species.

DAVID SANDS

GORDON KAY

CORAL BEAUTIES

The Coral Beauty (*Centropyge bispinosus*) is one of the most commonly seen members of the Centropyge genus. This species is widespread throughout the Indo-Pacific region, being found as far west as South Africa. It grows to around three inches in length and is extremely variable in colour. The most usually seen specimens are a lovely dark purple around the head, dorsal fin area, tail and anal fin, with a lighter area along the flank. This lighter area has a series of vertical bars which are the same purple colour as the bulk of the body.

"Bispinosus" is very hardy if kept under the correct conditions and its behaviour will indicate what these conditions are. This is a very shy species and will only be happy in an aquarium with plenty of nooks and crannies into which it can retire if it feels threatened. Also, because of this shyness, it should never be kept with bullies or ebullient species, which would prevent it from feeding. My Coral Beauty has been living in an invertebrate aquarium for some three years and this type of environment seems to suit it fine.

BICOLOUR ANGELS

The Bicolour Angel (*Centropyge bicolor*) also comes from the Indo-Pacific, being most common around the Philippines, Malaysia, Japan and Australia. "Bicolors" have acquired an unfortunate reputation for being difficult to keep but I am convinced that this has a lot to do with the fact that many of the specimens which we see come from the Philippines, where collecting and handling methods can be suspect. I have been keeping a pair of this species for nearly two years and they are disgustingly healthy! However, I did buy them from another hobbyist and so knew their background.

These are my own personal favourite Angels and I never fail to get a thrill when I watch them in the aquarium. With bright yellow head portion, vivid blue posterior and head bar and then solid yellow tail, they are a sight to behold.

The "bicolor" is also one of the most interesting species in terms of territorial and breeding behaviour. They prefer areas of algae-covered rubble and each group of six or seven fishes occupies a joint territory which the male defends against other groups. Usually, there is only one male in the group, although there is sometimes a 'bachelor male' but he does not mate with any of the females in the group. The male rules his small harem like a dictator, visiting his ladies several times during the day, patrolling the borders of his patch to make sure that no surrounding families come in to feed. All bicolours, as in every *Centropyge* species, are born female with some changing to males later. If the dominant male were to be killed, either the highest female in the group's hierarchy or the bachelor male will take his place. In the case of a female changing sex, this can be achieved in the space of a few hours.

This species will be happy in the aquarium if their preference for areas of coral rubble and plenty of algae is borne in mind when decorating the tank. A heaped formation will go a long way toward their overall well-being. They are not easily intimidated but are certainly no bullies and so they live happily with most things.

FLAME ANGELS

Coming from a different part of the world is the Flame Angel (*Centropyge loriculus*), which is found only around Hawaii. Growing to around four inches, this lovely species is unusual in that it is a bold orange-red colour, with six black bars along the flank and a dark purple colouring to the rear of the dorsal and anal fins. Unfortunately, "loriculus" is not cheap — you will need to part with fifty pounds or so — but you will be well rewarded because the Flame Angel is very hardy and easy to feed, eating almost anything you offer. This species seems to have no special requirements with regard to tank layout but, as with most of its cousins, it should be kept well away from bullies.

CHERUBS

Hailing from the West Indies, the Cherub Angelfish (*Centropyge argi*) epitomises everything I have said about Dwarf Angels. Being small — growing to only two and a half inches — hardy and easy to feed, it is the ideal aquarium fish.

Widely distributed around the Caribbean, the Cherub is a lovely purple colour all over, except for the head and throat region, which is amber coloured. There is a purple ring around the eye and the preopercle (or cheek) spine — which is possessed by all marine angelfish species — also has a purple tinge. This is another species which lives over areas of coral rubble where there is plenty of algal growth and, again, the aquarium decor should reflect this. The Cherub is also a shy little fish which would be glad of a few 'bolt-holes'.

AQUARIUM MAINTENANCE

The majority of Dwarf Angelfishes will present no problems when it comes to feeding. They will accept the usual fare of prepared and frozen foods with relish. They do, however, have a preference for live brine shrimps, frozen bloodworms, lobster eggs and mussel meat. Very occasionally, a feeding of frozen ox liver is also a good idea. Most important, however, is the fact that the Angels must live in an aquarium where there is a good growth of green algae. This is the major part of their diet in the wild and they just will not thrive without it. Some other vegetable matter like spinach, lettuce or peas should be provided regularly if the algae in the tank are not up to scratch but this should always be regarded as a very poor substitute. I will not labour the point of good water quality because you have no business keeping anything in water that is anything but perfect anyway. Suffice to say that regular, partial water changes **MUST** be done and overstocking, as well as overfeeding, kills.

A number of *Centropyge* species have spawned successfully in the aquarium, with the tougher members like the Coral Beauty, Cherub and Flame Angels providing the best chance. To achieve this, the tried and trusted method of buying five or six juveniles and then waiting for them to pair off naturally is still recognised as the best. Buying just any two fishes will result in fighting. Unfortunately, spawning is the easy part. The eggs are not laid on a rock, or some other nest site, but are released into the water, just after dark. Because of this, the problem comes with collecting and hatching the eggs and then, later, feeding the fry.

Space dictates that only four species have been mentioned here and it would take a whole magazine to cover every member of this and the related species of Dwarf Angels, but each one of them demands roughly the same sort of care and will reward the conscientious owner with years of pleasure. Anyone who cannot house an Emperor, or one of its "cousins", should take a look at the *Centropyge* genus. The dazzling dwarfs deserve more than to be considered second best.

C. argi, the Cherub Angel, is hardy and easy to feed.

TIM HINETT

Coldwater jottings

Stephen J. Smith

Danger in clear water

A telephone call towards the end of last season from a rather distraught fishkeeper pointed out a problem which had devastated his season's young fish:

"I've done all the things we are supposed to do at the end of each season", he explained. "I emptied the pond, having first transferred the fish to an old bathtub, and scrubbed the liner thoroughly with clean, fresh water.

"I even let the pond stand for a couple of days after it was refilled to allow chlorine to dissipate."

"The day after returning the young fish to their quarters half of them were dead!" he continued. There was certainly no doubting his disappointment so I agreed to call in to see him that afternoon.

I must confess that the sight of around 100 half-inch fry scattered over the top of the pond was not a pleasant one. Closer inspection revealed the bodies of all the dead fish to be split along the underside, forward of the vent.

"Oh dear," I muttered, "I bet you had quite a pea-soup of a pond before you cleaned it!"

My friend explained that he had put the fry into the pond at around six weeks old and had not changed any water since; so the pond had gone dark green, before he had decided to clean it.

Which explained everything: the fry had been feeding on algae, abundant in the water before my friend's "Spring-clean", and this had built up in their intestines.

This presented no problem to the fish while they were in such a murky environment — indeed, algae provide a rich source of nutrient.

Young fry, however, have quite transparent bodies and, when transferred to clear water, the living algae in the intestines of the fish produce further oxygen in response to the increase in light.

This had caused the intestines of my friend's fry to swell — resulting in the most disastrous consequences.

The remedy: for these fish it was obviously too late.

However, by using marginal and floating plants — I find Parrot's Feather and lilies an ideal combination — the water will remain clear more easily. Partial water changes are beneficial, and they also help to remove excess ammonia in the water.

Syphon the water out using gauze, held over the end of the hose by an elastic band, to avoid fry being sucked out.

Embolism

A similar condition related to excess algae in the pond and a subsequent over-abundance of oxygen can be recognised by the appearance of bubbles in the finnage of adult fish. Called "embolism", or Gas Bubble Disease, this is caused by oxygen saturation in the bloodstream of the fish.

The bubbles eventually split the membranes of the fins giving the fish a ragged appearance and exposing it to the threat of diseases through the open wounds.

Moving the fish to fresh clear water will help to cure the condition, as will a water change of at least 50 per cent.

But prevention is far better than any cure, and again, shading the pond with plants will help to cut down the amount of sunlight actually reaching the water.

Pond management made simple

A full class of 58 enthusiastic pondkeepers attended a course last autumn on fishkeeping and pond management. So great was its success that the organisers will be repeating it from this month.

The course is held at Longmeads House, Ongar Road, Writtle, near Chelmsford, Essex and starts on 14 January (7.30-10.00 pm).

Organiser Diane Hull informs me that the course is designed for all coldwater fishkeepers and covers aspects such as building a pond, stocking, and fish husbandry.

"We hope to help people to become fishKEEPERS rather than fish KILLERS," explained Diane.

The course runs for eight weeks and enrolment is only £12.50 per person. It's still not too late to enrol, and further information can be obtained by ringing **Diane Hull** on **Chelmsford (0245) 442063** (evenings).

"Tail Piece"

A fishy tale of a fish's tail has been sent to me by Andre Gibbs of Sherborne, Dorset, who describes in comprehensive detail a successful surgical operation on an injured Koi.

According to Mr Gibbs, the operation was carried out by a veterinary surgeon ('do it yourself' surgery is certainly not recommended).

Explains Mr Gibbs, "Mitzu, a four year-old Orenji Ohgon, had a clean vertical laceration, about an inch long on the upper part of the caudal fin, severing three bones completely."

He continues, "The fin was splinted and sutured, but the splinting was unsuccessful and was removed after a couple of days. The fin was trimmed to the second bone level and after about ten days the trimmed area had healed, while the remaining lacerated area had knitted perfectly."

Mr Gibbs went on to explain that, however, the fish ws unable to close its mouth. When, by the seventh week, a subsequent swelling half blocked the Koi's mouth, he decided that "radical surgery" was necessary.

"Pre-operative examination confirmed that this was indeed a malignant growth," continued Mr Gibbs.

"Suitably 'gowned up' and in semi-supine position (Mitzu — not the vet!) it was evident that the lower jaw, fractured midway along its length, had sunk inwards obstructing the oral cavity and preventing the mouth from closing.

"The mandible was reset and secured with bone sutures to retain its normal alignment — while ensuring that when set, the initial problem of 'open mouth' would not be replaced by one of 'perpetually closed'."

After two weeks in a long-term bath of acriflavine and salt, the stitches were removed and Mitzu was returned to the pond — to an evidently warm reception:

"In a split second, every fish in the pond completely surrounded Mitzu — and I do mean close bodily contact," said Mr Gibbs.

"At least two dozen fish continued this for over an hour, and for the following couple of hours a shoal followed his every movement totally!"

NEXT MONTH

- *Comprehensive Beginners' Guide to Freshwater Aquaria with articles by some of the country's top writers on:*
  1. *Setting up your new aquarium*
  2. *The equipment you will need to get started*
  3. *The best fish to choose*
  4. *Ideal beginner's plants for the aquarium*
- *Spotlight on the Five Banded Barb — a beautiful relative to the Tiger Barb*
- *Competitions, Product Round-up, popular regulars and much, much more.*

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 the name of the expert to whom your query should be directed.* All letters must be accompanied by a S.A.E. and addressed to:
Your Questions Answered, The Aquarist & Pondkeeper, Buckley Press Ltd, 58 Fleet Street, London, EC4Y 1JU

TROPICAL
Dr David Ford

COLDWATER
Pauline Hodgkinson

PLANTS
Barry James

KOI
Roger Cleaver

MARINE
Graham Cox

DISCUS
Eberhard Schulze

Tropical

Breeding convicts

I have recently acquired a pair of Convicts which are housed on their own in a 24in tank. Are these fish easy to breed?

There are two convicts — the Convict Cichlid, *Cichlosoma nigrofasciatum*, and the Convict Julidochromis, *Julidochromis regani*. Assuming it is the more common Convict Cichlid, there is no problem with spawning the fish because they demand no special water conditions. Just supply a plant pot or smooth rock and feed well on meaty foods. They are very good parents and the young grow rapidly on microworms and then carnivore flake. Unfortunately, they cannot be trusted with smaller fish in a community tank.

Red Piranha

I bought three Red Piranha (Serrasalmus natterері) *some months ago but lost two after they had seemingly recovered from a bad attack of fungus. One started to dart about the tank and died the next day, while the other simply became inactive and faded away.*

I fed them on raw fish, liver and, sometimes, goldfish. The tank (38in x 15in x 12in) has a 100-watt heater and a filter. However, I have no plants because I have been told that Piranha dislike light. All my plants have, therefore, died.

Your advice would be most welcome. Also, how long do Piranha live for and what is the best book available on these fish?

Piranha are difficult fish to keep. Unlike their Hollywood image they are nervous fish and not good subjects for the home aquarium. Also, one Piranha is always likely to take a bite out of another. I have kept two Piranha together for years and then one day one killed the other for no apparent reason at all.

Sorry to read of the fungus problem. The difficulty with this infestation is that it is a secondary disease, indicating some other illness or damage. Hence, although you have successfully removed the fungus, there remains the primary problem. What that is, cannot be diagnosed from such limited information — dashing around the tank could indicate parasitic irritation, a parasite in the brain or even something toxic in the water.

If you really want to buy more Piranha I would recommend planting the tank, or getting some plastic plants. It is more important for the fish to have somewhere to hide than be kept under low lighting.

Your diet sounds O.K. Earthworms and chunks of fish and shellfish are better than sacrificing goldfish. There are no records of longevity but some aquarists report keeping the fish for several years. For more information see: The Piranha Book by Dr. George S. Myers TFH publication No. M-539.

MICHAEL GILROY

An adult pair of Convict Cichlids, male above.

Worm cataracts

While observing one of my Spiny Eels I saw a minute parasite "walking" over its eye. What could it be? Will my other fish be infected?

It sounds as if your eel is suffering from Worm Cataract, a parasite that attacks the eyes, called *Proalaria spathaceum*. It originates from snails and will not infect other fish directly — only via a complicated life history involving birds, snails and fish. Hence it should die out in your aquarium.

Discus

Discus and plants

I have a 4ft aquarium which I would like to change into a Discus aquarium. My problem is that I want a beautifully planted aquarium, as well as Discus, but have been told that it is not possible. I seem to remember that I once visited The Highgate Aquarist in London several years ago and saw a large display aquarium which not only contained Discus fish but also a nice selection of plants. Do you think I can keep Discus fish and plants together?

Of course it is possible to keep Discus in a planted aquarium. You only have to be careful with the selection of the plants. 'Red' plants as such, which are difficult to grow in any case because they need

much more light than is often given to the aquarium with a single Grolux tube, will not be suitable.

Plants which will grow in a Discus set-up with its higher temperature are: *Crinum* (the Onion plant), many of the Cryptocorynes, especially *C. pontederifolia, C. spiralis, C. bechettii,* brown *C. wendtii,* green *C. wendtii,* grey *C. wendtii* and *C. willisii.* From the Amazon sword plants one can use *Echinodorus amazonicus, blehers, intermedius, peruensis, rubra* and even *tenellus* (which is a heavy feeder). Aponogetons can also be used once they have slowly been acclimatised to the higher temperature. Wisteria will grow without any problems at all and so will *Sagittaria platyphylla, pusilla* and *subulata.*

What you must remember, though, is that such an aquarium requires somewhat more light than one would normally provide. An additive to the gravel bed is also required. Laterite or Ferrogan mixed with the gravel bed will provide the plants with all the iron needed.

Marine

Power failures and biological filters

In the event of a power failure, for how long would a marine aquarium's undergravel filtration system stay biologically active?

To answer your question in specific concrete terms is very difficult due to the large number of interacting factors which determine what is the precise level of dissolved oxygen in the water available to the nitrifiers to start with. The most influential amongst these factors are the temperature of the seawater, its specific gravity; its pH and the biological oxygen demand (B.O.D.) of the system as a whole.

From personal experience, however, I can assure you that in the early seventies, due to national industrial disruption, we in the Heathrow area were getting regular power-cuts from 8.00 am to 8.00 pm each day. My own company's 34-tank system (5000 gallons of seawater in all), all filtered solely by undergravel filtration, didn't lose a single fish throughout the entire period of several days that the action continued.

We increased the seawater's ability to dissolve oxygen by reducing water temperatures to 70°-72°F (22°C) and reduced all S.G.'s to 1.018. All feeding was suspended throughout the period of the strikes to reduce the B.O.D.

One final thought. In any period of industrial unrest, it is those marine aquarists with the lightly-stocked, large surface area per volume of seawater tanks whose creatures will survive best.

U/G and power filtration

I am setting up a 60in x 18in x 18in tank and intend to use undergravel filters powered by two powerheads. Will 4in of gravel and sand on top of the filter plates be enough? I also have an external power filter from my freshwater days. It has a turnover rate of 540 litres per hour. Should I add this to my system? If so, what media should I use?

The amount of gravel and sand you already have will be quite adequate once it has matured.

External power filter. I would certainly run this filter as well on your new marine aquarium. The undergravel filter is the most efficient and cost-effective form of filtrant known to aquatic science. Unfortunately, however, it is not perfect — nothing ever is. The one drawback of U/G filtration is that you cannot easily use charcoal with it.

Your 540 litres/hour external filter, filled 2/3rds full of marine-grade charcoal and 1/3rd full of filter-wool will provide invaluable supplementary filtration. Change the charcoal as soon as the seawater begins to turn yellow when viewed endwise through the tank, ie. looking through five feet of seawater onto a white card.

Plants

New Plant

I have just purchased a new plant from my supplier, but he couldn't tell me what it's called. It grows from a bulb like an onion, has dark-green narrow leaves less than ½in. in width and is tightly twisted.

You have a new import called *Crinum aquaticum.* It comes from West Africa. Little is known about this species but it has proved a hardy vigorous grower at my nursery. It has no special requirements as to water conditions and thrives at a temperature of between 72-80°F. It seems to appreciate regular feeding with a liquid fertiliser and thrives in moderate lighting.

Algal problem

Seven months ago I set up a fully planted tank which has recently developed a black growth, almost like soot. It is affecting all the plants, the filter air lifts and even the artificial log and slates I have in the tank. What is it and how can I get rid of it?

Your problem is caused by filamentous algae which have tiny root-like structures that burrow into living plant tissue. These algae are difficult but not impossible to eradicate. I suggest that you scrape off as much of the growth as possible and check your lighting levels. This should amount to 20 watts per square foot of surface area. Two tubes, one a Grolux type and the other a Sun-Glow/Truelite/Northlight type should be used. When the aquarium is first planted you should leave the lights on for 48 hours, afterwards reducing this to 10 hours per day. If the room admits sunlight then this will complicate the formula and may lead to algal growth.

Sub-gravel filters may affect plant growth and can, therefore, add to your problems.

I also suggest that you use an effective algicide to help eliminate any growth which remains.

Coldwater

Temporary quarters

I am having problems getting hold of something along the lines of a fibreglass stock tank to house my fish while I make alterations to my pond over the winter months. I am looking for something reasonably deep although it will be kept in a conservatory. Have you any suggestions?

Some of the pond manufacturers and wholesalers who advertise in *A & P* may have just what you require. I, therefore, suggest that you give them a ring. If your search proves unsuccessful, you could construct your own temporary stock tank from a sturdy wooden box of the type used as packing cases and discarded by wholesalers after use. Since these are often broken up, some businesses are only too pleased to have them taken off their hands. To make a stock tank simply line the box with a one-inch thickness of polystyrene, followed by a stout plastic sheet. Crates come in all shapes and sizes and can last for a long time. For instance, I obtained several four-foot square boxes some years ago, painted them on the outside, put them into use and still have one in operation today.

Ulcers

My fish have been suffering with ulcers. Many have already died, but the problem still persists. I feel I am fighting a losing battle. Is there anything I can do?

This type of infection is highly contagious and all equipment, nets, etc used in connection with sufferers must be kept separate from healthy stock.

The type of bacteria which cause the ulcers are *Aeromonas* and *Pseudomonas,* but secondary infections such as septicaemia and dropsy often occur before death.

Unfortunately, new stock can bring this problem in with them and, often, it is several weeks before this dreadful disease reveals itself. That is why I always recommend that new stock should be kept in quarantine for at least six weeks, using separate nets, etc.

I am afraid that I can offer little hope of a cure, although antibiotics have been used with limited success. I am always reluctant to advise that fish should be destroyed, but in severe cases, it is (I am sure) the kindest step, especially where suffering is occurring.

Before buying new stock all equipment, tank, filters, airline, etc must be sterilised; live plants are best replaced. I also suggest that, when looking around for replacement stock, you avoid fish from any outlet that has fish which show signs of ulcer disease because, as I have explained, it is highly contagious.

Tomorrow's aquarist

Results of the Red Herrings Competition

Last November we got together with Dr. Chris Andrews, the Assistant Curator of London Zoo Aquarium, and devised a competition to give one of our readers and their family a very special New Year. If you could answer our four cryptic clues and be first out of the hat, you would win **a year's Free Family Membership** to both London and Whipenade Zoos.

As a bonus, on your first visit to London Zoo, you would be an **Aquarium Keeper for the day,** with a guided tour behind the scenes and your own private preview of the preparations for the new Aquarium, which opens in 1988.

The senders of the next three correct entries drawn would each receive a copy of Chris Andrew's new book, **A Fishkeeper's Guide To Fish Breeding,** published by **Salamander.** This easy-to-follow guide explains the various techniques for breeding many of the popular fish, including cichlids, characins, catfish etc. and some coldwater fish.

Top, one type of 'Archer Fish'. Above, the REAL Archer Fish, *Toxotes jaculator*. (Photo: Laurence Perkins).

Now we have you tearing your hair out with suspense, here is the example clue we gave you and the four clues, with their correct answers — we have added the latin names for those who want to track down any they didn't know. The sample clue was: **"Do these fish come from Ambridge?"**; the answer being **"Archer fish".**

1. A prize specimen for a lepidopterist? Butterfly fish/cichlid (*Pantodon buchholzi/Microgeophagus ramirezi*).
2. Would the ewes find them appealing? Rams (*Microgeophagus ramirezi*)
3. An instrumental fish for a hillbilly . . . Banjo catfish (*Bunocephalus coracoideus*)
4. Do they fall in the Autumn? Leaf fish (*Monocirrhus polyacanthus*)

You will notice that with question one, there were two possible answers, both of which were put in the draw — that is why we asked for common names only!

First out of the hat with an all-correct entry was **Mr P Clayton,** 15 Hollins Glen, Slaithwaite, Huddersfield HD7 5LE, who wins the Family Membership.

The runners-up were: **Brian Curtis,** 19 Queens Street, Newmarket, Suffolk CB8 8EX, **Ruth Hallett,** 1 Portway Farm Cottages, Cholderton Road, Grately, Andover, Hants SP11 8LP, **Mr G. Sutcliffe,** 10 Haycliffe Terrace, Little Horton, Bradford BD5 9HD, each of whom will shortly be receiving a copy of Chris Andrews' book. Congratulations to you all! And our thanks to **London Zoo** and **Salamander books.**

Beginners' Corner

When is a beginner not a beginner? No — not another competition, but something we'd like you to think about. If you're keen on tropical fish and have kept them for years, your knowledge is probably extensive already. But what about marines, coldwater tanks — or even a garden pond? If you started to keep different types of fish, wouldn't you be a beginner all over again?

Last year we had a very interesting article from one of our readers — and a regular contributor to T.A. — **Jonathan Moss.** He explored the possibilities of a brackish water tank; an interest which was echoed by another of our readers, **Tyler Gladman** of Crawley, who sent us a long letter on the same subject. **Andrew Grant** has treated us to his triumphs and failures — setting up a supply of mosquito larvae and trying to breed *Aequidens curviceps.*

And now we have the space to publish another letter, from **Mr. J. Barstow** of Corby, Northants:

"I think **Beginner's Corner** is a good asset to have for both beginners in the hobby *and* enthusiasts.

My first experience was doomed from the start. I was 12 and was given a 36 × 12 × 15 tank. With very little knowledge, I set it up; putting in gravel, rocks, plants — and inadequate filtration (not knowing any better at the time). After two days, unperturbed by cloudy water and trapped bubbles, I rushed out to stock up.

The inevitable happened; every morning I found another dead fish and floating plants. I then went out to buy remedies galore, not realising that lack of advice was my downfall. I soon gave up.

Two years ago, my wife bought me a 30 × 12 × 15 tank and I'm glad to say I haven't looked back since. I now have *three* tanks. The most important thing I found was to read as much as you can, digesting all the advice the experts give on every aspect of the hobby. A good dealer is also invaluable — someone who will be only to happy to give you advice on any aspect of fishkeeping, from equipment to disease.

I hope this letter will help a beginner to stick at it and make a success of a good, healthy and fascinating hobby. I don't know what I'd do without it."

Open invitation to T.A. readers

Thank you for your letter, **Mr. Barstow.** We will shortly be sending you a **Whisper 200** air-pump from the **TA Fund,** kindly donated by **Interpet.** You raise some very good points and we wish you good luck and good reading. There is, however, something you have overlooked: The 'recognition' factor. This magazine offers a wealth of *advice* from experts, but what about the value of *comparison* among the less experienced?

So we are throwing down the gauntlet to all readers of T.A., beginners *and* experts. Let us know about your experiences in the hobby: what fish you have bred and how; what tips you would like to pass on to all of us; you name it, we'd like to hear about it. We will be offering **surprise aquatic gifts** for every account published and are giving our new T.A. column the grand title of **'The Self-Help Club',** to which you should address your letters. We look forward to hearing from you.

OUT AND ABOUT with John Dawes

Pet advice open days at 'The Pet Shop' of Petts Wood

Concerned by the lack of specialised knowledge in various areas of pet keeping, The Pet Shop of Petts Wood have begun organising a series of Open Days during the winter months during which they are inviting a variety of experts to come for the day and talk to customers.

Keith Ward, the proprietor, says "Try as hard as we do, we cannot hope to be experts in every aspect of animal care and attention, so we felt it was high time we invited experts in their field to come and talk direct to our customers and staff."

Events already organised include visits by Dr Roger Mugford, vet and dog psychologist, and developer of the Halti training collar, and Dr David Pool of the Tetra Information Centre.

The shop is open from 8.30 am to 5.30 pm on Saturdays and the experts are in attendance from 10.00 am until 4.00 pm.

For further information, contact Keith Ward or Roger Causton during shop hours on **Orpington 25543** or at **121-123 Queensway, Petts Wood, Kent.**

New Leopard Sharks at London Zoo

The Aquarium at London Zoo has recently acquired two young Leopard Sharks (*Triakis semifasciata*). Originating from the Pacific Ocean off the west coast of the United States, Leopard Sharks may grow to five feet in length. They are very active and particularly attractively marked. The two fifteen-inch specimens at the Zoo are currently kept in a 1,000 gallon tank with a large shoal of *Monodactylus* (Monos).

Their diet is a varied one consisting of chopped squid, fish, mussels and prawns, and it is intended to grow both specimens on for display in the New Aquarium due to open in two years' time. London Zoo have kept Leopard Sharks in the past, and in the 1960's, two young specimens were exhibited for over 10 years.

T. semifasciata is a close relative of the Smooth Hounds (*Mustelus*), and gives birth to live young. Although these sharks are equipped with rows of relatively small teeth only, there is at least one record of a Leopard Shark attacking a diver.

In addition to the new shark display, there are other attractions worth visiting the Aquarium for.

Feeding time is always an interesting spectacle. It takes place daily between 2.00 and 3.00 pm. Although not every "spectacular" species is fed in full view every single day, some feeding can always be seen. Piranha, Eels and Paddlefish are just three of the larger types of fish which invariably attract crowds of admirers. So does the big Coral Community Tank, although in a very different, but equally absorbing way.

The Aquarium now has a breeding display which includes both egglayers and livebearers. The Anabantoids (Gouramis, Fighting Fish, etc.), often build nests in the display tanks while there is invariably something to see in the Cichlid section, where a selection of tanks set up with the assistance of the British Cichlid Association, illustrates open spawning, cave spawning and mouthbrooding techniques.

The Zoo offers reduced rates during winter months, extending, at least, up to February. Adults: £3.00; Children £1.50. The Aquarium is open throughout winter from 10.00 am to 4.00 pm.

If you like strolling around, away from the huge spring and summer crowds, now's your chance — and at a bargain price too!

For further information contact: **Dr Chris Andrews, Assistant Curator, London Zoo Aquarium, Regent's Park, London. Tel: 01-722 3333.**

The Aquarium's new Leopard Sharks. (Photo: London Zoo Aquarium).

1987 'Aquarian' Fishkeeping Exhibition

Thomas's, manufacturers of 'Aquarian', have confirmed that they will be running their fishkeeping exhibition in 1987.

The 1987 'Aquarian' Fishkeeping Exhibition will once again be held at Sandown Park Exhibition Centre at Esher, Surrey. The show will be held over the weekend of **20 and 21 June.**

"This will be our fourth consecutive show", says Ron Hillcoat, Brand Manager at Thomas's. "Last year was a tremendous success with almost 12,000 visitors over the two days. After the success of the show, we decided to book Sandown Park immediately to ensure that we could repeat the exercise without conflicting with the other aquatic shows".

This year's show will again be organised in conjunction with the 'Association of Aquarists', who will be co-ordinating and adjudicating the event.

Adrian Blake, past Chairman of the A. and A., who has been deeply involved from the start is also very enthusiastic. "The show has gone from strength to strength. Last year, in particular, the appeal was widened to attract not just aquarists but also the general public and this has helped to expand the hobby".

According to Ron Hillcoat, the 1987 show will be bigger and better than ever, "We've learned a lot over the past few years and such features as the children's play area and Learning Maze which proved so popular will be developed and incorporated for 1987".

Further information is available from **Dr David Ford, 'Aquarian' Advisory Service, Thomas's, Pellon Lane, Halifax. Tel: (0422) 50221.**

Y.A.F. on the move

After twelve successful years at Doncaster Racecourse, the Yorkshire Aquarist Festival is on the move.

One major deciding factor has been the considerable interest generated by the introduction of a Koi show (run by the South Yorkshire section of the B.K.K.S.) at the 1986 Festival. The extra space that such a show demands, along with other envisaged expansions for the future, quite simply means that Y.A.F. has outgrown its Doncaster venue.

In 1987 it will be staged at the **Queens Hall, in Leeds.** The new dates (which, it is hoped, will also prove to be more convenient for some northern aquarists) will be **12-13 September.** I wish Y.A.F. and its hardworking team of organisers, the very best of luck and a long and ever-more-successful future.

For further details, contact: **Brian Boyden, Chairman (Y.A.F.), 229 Lockoford Lane, Tapton, Chesterfield, S41 0TJ.**