

SEPTEMBER 1987 95p

AQUARIST

AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

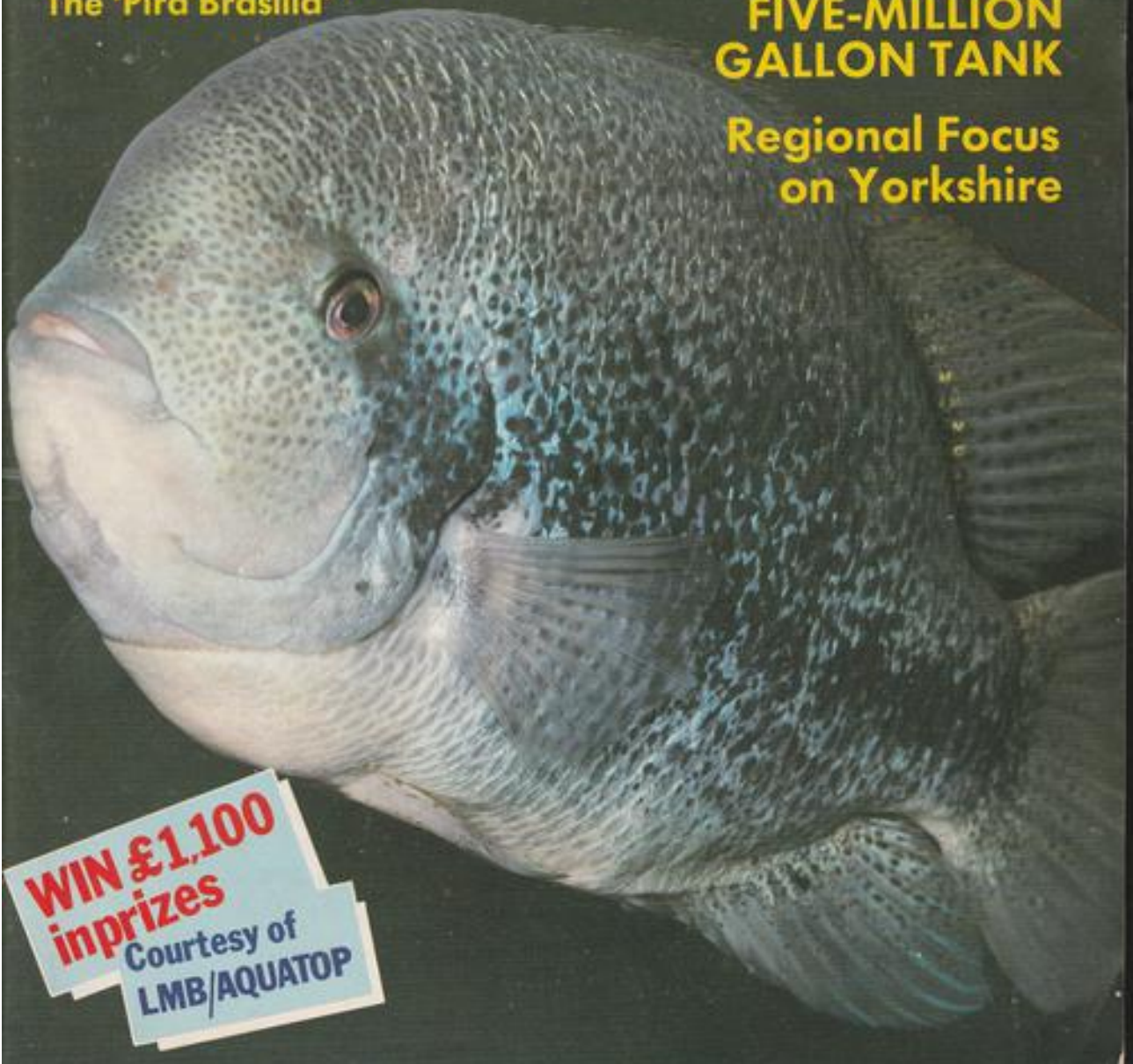
FOCUS ON KILLIES:

Killies of Oman,
Spotlight on *N. furzeri*,
The 'Pirá Brasília'

Collecting
Native Marines

**FIVE-MILLION
GALLON TANK**

Regional Focus
on Yorkshire



**WIN £1,100
in prizes**

Courtesy of
LMB/AQUATOP

AQUARIST

AND PONDKEEPER

FISHKEEPING AT ITS VERY BEST. ESTABLISHED 1924

SEPTEMBER 1987

CONTENTS

Vol. 52 No. 6

3

THE SOUND OF SILENCE

Who was it said that fishkeeping was a gentle, restful, therapeutic and quiet hobby? Amanda Grimes' experiences cast some doubt on this bold statement.

9

COLLECTING NATIVE MARINES

Our native marine expert, Andy Horton guides us through the do's and don'ts of collecting . . . and much more besides.

20

FISH TANK PHOTOGRAPHY

Ever tried taking fish photographs . . . and failed? Ron Brown may well have the answer to your problems.

FOCUS ON KILLIES

45

THE KILLIES OF OMAN

Ray Hocking of West Cornwall Fishkeepers spent some time in Oman and collected the very striking and lively Falaj Fish. Intrigued? Read on . . .

48

SPOTLIGHT

Nothobranchius furzeri is a colourful but shortlived Killifish which gets this month's Spotlight treatment under the expert eye of Rod Roberts, chairman of the British Killifish Association.



Photograph by Courtesy of 'Aquarian'

COVER STORY

The magnificent specimen gracing our cover this month is 'Rambo', an impressive *Theraps (Cichlasoma) hartwegi* owned by C. Walton, a member of Bracknell A.S. 'Rambo' was the clear, and worthy, winner of the Best in Show award at this year's 'Aquarian' Fishkeeping Exhibition which was held at Sandown Park on 20-21 June, and on which we reported in our August issue. For the record, T. (C.) Hartwegi, the Tail Bar Cichlid, is a Mexican substrate-spawner which is relatively easy to keep and breed in well-filtered, roomy aquaria. The species was first described scientifically as recently as 1980 and is therefore still considered as a relatively new arrival to the hobby.

REGULARS

Out and About, 7 Books, 13 Letters, 16 Product Round-up, 26 Coldwater Jottings, 29 News, 30 News from the Societies, 35 Diary dates, 35 Naturalist's Notebook, 39 Your Questions Answered, 42 Helping Hand, 63 Tomorrow's Aquarist, 68 Cartoons: Tanked Up, 35 Fred the Piranha, 43

COMPETITIONS

Plant Fertiliser System Competition (sponsored by Everglades Aquatic Nurseries), 13 WIN over £1,100 in prizes in this unusual, easy-to-enter competition sponsored by LMB Aquatics and Pets Ltd (incorporating Aquatop Tanks), 19 Red Sea Books Competition (sponsored by Immel Publishing), 54 Underworld Automatic Feeder Competition winner, 43 UNO Products Competition winner, 43

PUBLISHER, Andrew Blair. PUBLISHING DIRECTOR, Tony Bennett. EDITOR, John Dawes. ART EDITOR, Paul Davies. PRODUCTION MANAGER, Christopher Benn. ADVERTISEMENT MANAGER, John 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 and sent to: Aquarist Subscriptions, Subscriptions International Ltd., 92 Queensway, Bletchley, Milton Keynes MK20 2QV. Telephone: 0908 70761/USA DISTRIBUTOR: LEWIS BOOKS ISSN 0003-7273. Printed by Hastings Printing Company Ltd.

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50

PIRÁ BRASÍLIA

Otherwise known as the Lyrefinned Pearlfish, *Cynolebias boitoneri* is both beautiful and under threat in the wild. Jaroslav Kadlec provides a fascinating close-up of the species.

53

PERSONAL THOUGHTS ON WATER ECOLOGY FOR KOI-KEEPERS

John Cuvelier presents his thoughts on this difficult subject — as only he knows how.

57

THE FIVE MILLION GALLON TANK

Follow Dr David Ford on his visit of a lifetime to Florida's Disney World.

65

REGIONAL FOCUS — FISHKEEPING IN YORKSHIRE

To coincide with the Yorkshire Aquarist Festival, Dr David Ford of 'Aquarian' gives his own personal, informative and entertaining view of the fishkeeping scene in Britain's largest county.

THE SOUND OF SILENCE

"Fishkeeping is such a gentle, restful interest," enthused an acquaintance once. "So quiet . . . so therapeutic," she added,

giving me such a pleasant, innocent smile I hadn't the heart to disabuse her.

Gentle? She hadn't seen my Nannacras throwing each other round and round their breeding tank, jaws locked, till I was fraught with anxiety and they lay exhausted on the gravel. She hadn't been there when I wanted to examine the Skunk Loach more closely for what looked like White Spot — and 'gently' fished him out after a two-hour chase in a well-furnished community tank.

Restful? I suppose there are more strenuous occupations than carting gallons of water to and fro, over cats, onto chairs and into high tanks, on a basis regular enough to make weight-training an inviting alternative.

As for therapeutic — can there be anything more confidence-building or reassuring than turning your back on a newly-cleaned power filter, feeling that now it is safely installed you can take time off for a cup of tea — only to return to find it placidly emptying 30 gallons of water onto

By
AMANDA GRIMES

the floor through the 'seal' you thought you had double-checked?

Quiet was the nearest she got to the truth. The gentle, constant background hum of the pumps only becomes an annoying vibration when passing cars dislodge them from their carefully selected sites on the tank lids — one inch either way and they're drumming up a tattoo worthy of Edinburgh. The power filters run silently, after they have cleared the initial rush of air through their systems. The bubbling sound of the airstones becomes way of life. And most fish are quiet . . .

We had a war here, a few years ago, that no one got to hear about. Deep in the leafy suburbs of London, we heard the sound of gunfire. Not so unusual, as we were watching the news. What mystified me was that

A pair of "coughing psychopaths" . . . honest! Alias, upside-down Catfish



ARTISMAN GALLERY/HEPHER/STUDIOS

the reporter didn't seem aware of it.

"Here in Tripoli," the story was going, "things are getting back to normal . . ." Something along those lines. Then, the distant sound of machine-gun fire. Not a murmur from the intrepid journalist, not even a look of embarrassment.

"Nerves of steel," I muttered with admiration.

"What?"

"Incredibly brave, these overseas correspondents."

"What are you waffling on about?"

"That gunfire. She ignored it. Didn't even glance round. Amazing."

"What gunfire? There hasn't been any gunfire."

"Yes, there has. Just now. Listen . . . there, that gunfire!"

"That's the croakers, you idiot." An element of irritation was slipping into the conversation. I could tell; I'm sensitive to these things.

"Local guerrillas, eh?" What a name!

"The Gouramies. The Croaking Gouramies. In the tank. Remember?"

A friend of ours stayed over one night. I always stay up till well gone three and was quietly reading in my room when I heard a tentative knock on the door. A rather nervous and whispering friend hissed in my ear: "I think someone is trying to break in. Would you come and look?"

Picking up the torch, I crept through to the living room where she had been sleeping. There was no one there and, after talking for a while to soothe our nerves, she went back to bed and I to my book. A few days later, I had switched out the lights and was leaving the living room when I heard a loud rattling noise, like someone trying to force the lock on the window. Only the noise was coming from the tank in the corner. My large female *Ancistrus* was hanging on the Tubifex feeder, rocking backwards and forwards, guzzling . . .

I'm a glutton for punishment when it comes to watching horror films; particularly the ones where the lone women in the house are convinced that the psychopath is prowling the outside of the house, looking for a way in. You, of course, know that he's already inside and these idiots creep round in pitch black while you scream at them not to go in the kitchen/cellar/down that corridor. Audience participation, I think they call it. Needless to say, after watching these films, I sidle round the flat with my back to the walls and my heart in my mouth.

My sister came home from work a while ago, looking haggard and tired. She said she hadn't slept well the night before.

"Was the TV too loud?" I asked guiltily, having indulged in a particularly loud late-night horror.

"No, I could hear it and had a good idea what was going on but it wasn't that." She hesitated. "It was a cough. I heard it clearly, coming out of the dark in my room. I lay awake for hours, too terrified to close my eyes . . ."

The psychopath came back to visit us a while later. We caught him creeping through the night world, intent on murder. One Tubifex-seeking Upside-down Catfish . . .!

OUT AND ABOUT

with John Dawes



DICK MILLS



DICK MILLS

Left, General view of the dry goods area. Right, Part of the coldwater area which viewers to BBC's Animal Roadshow may have seen.

Oxford's Goldfish Bowl

It's not every day the merits of the humble goldfish bowl are broadcast, but in the last edition of BBC TV's ANIMAL ROADSHOW it sort of came true. The Goldfish Bowl in question was not your ordinary small glass affair but the aquarium store of the same name in Oxford. Over the past decade or so, it had become one of 'the' shops to visit both for its high-quality stock and expertise of the owner Max Gibbs.

Not content to rest on his laurels, Max has continually uprated his premises and, at the time of the TV recording, had almost finished the new coldwater room which readers may have seen in the transmitted programme. The very large tank contained equally impressive Fancy Goldfish from China that obligingly went through their spawning actions for the cameras. The tropical freshwater area has banks of aquaria sited on each side of a specially-lit, cascading filter-fed central plant display; at the far end, 'Flipper', the large *Phractocephalus hemiopterus* surveys all. Nothing too rare about, you may be thinking, until it dawns on you that the fishes are grouped according to their origins — South American one side, African and Asian the other.

On the right hand side of the premises there is a separate livebearer hall: moving on, past some marine invertebrate displays, one reaches the tropical

marine section where there are many attractions to detain and tempt the visitor. It is not until you retrace your steps that you realise that you walked past a stunning display of marine invertebrates just inside the street door, as well as a complete simulated rockery and cold-water pool! The very well stocked dry goods area flanks the far side of the central area, and all round the remaining walls are rows of books and

aquariums.

Not all improvements and developments are in the public gaze, as out of sight is a completely new water filtration centre under construction with familiar banks of UV sterilisers, high-pressure sand filters and protein skimming equipment. Despite all this continuing upheaval, all the tanks are immaculately kept, the shop retains its original 'eat off the floor' cleanliness and still

manages to do a roaring trade. Max is always pleased to accommodate visits from Societies (subject to prior arrangement, of course) and partner/manager Barry will be only too delighted to show off the treasures in store. This is one Goldfish Bowl you can recommend to a friend.

Goldfish Bowl, 118/122 Magdalen Road, Oxford (Tel: 0865 241825)

Dick Mills

Important Y.A.F. reminder

Event: Yorkshire Aquarist Festival
Venue: Queen's Hall, Sovereign Street, Leeds.
Date: 12-13 September

If you haven't already done so, make a special note in your diary — from now on, the Yorkshire Aquarist Festival will be held at the Queen's Hall in Leeds.

This year's show which, according to the organisers, promises to be better than ever, will once again feature a Koi Open Show (one of last year's resounding successes). To quote from the pre-show details released, the quality and value of some of these fish "has to be seen to be believed".

A higher number of tableaux entries and an expanded trade section are also promised and the Y.A.F. committee con-

fidently claim "that all aspects of this fascinating hobby will be well and truly catered for." Trade stands will therefore be geared up to meet the needs of both first-time aquarists and long-established ones alike.

Other interesting statistics include the first-ever public showing of a giant 22ft x 18ft x 12ft (high) exhibit among the tableaux entries.

Referring to the move to Leeds after twelve successful years at Doncaster, Y.A.F. committee Chairman, **Brian Boyden**, says, "The years spent at Doncaster were happy ones and our thanks must go to the staff at the Doncaster Exhibition Centre for the excellent way they looked after us. Our prime reason for the move is simply to be able to take our show to a much larger audience — something that has to be of benefit to all concerned." He also added, "The Y.A.F. com-



mittee would like to thank everyone who has supported the show in the past and, at the same time, extend a warm welcome to anyone visiting us for the first time at the Queen's Hall in Leeds on 12-13 September, between 9.30 am and 6.00 pm."

For further information, contact **Brian Boyden**, Y.A.F. Chairman, on Chesterfield (0246) 74967.

We, at *A. & P.* offer Brian and his committee a most successful festival. See you there!

COLLECTING NATIVE MARINES (TECHNIQUES AND USEFUL HINTS)

Andy Horton's occasional, and extremely popular, series continues with the do's and don'ts of collecting — and a great deal more besides. (Photographs by the author).

It is in the collection of the fish and invertebrates that the native marine aquarist differs most from his/her tropical counterparts. Not for him, or her, the easy task of entering the local pet shop, or specialist aquatic supplier, and purchasing from an attractive display of imported or specially bred fish. It is more a question of relying on personal resources and experiencing the joys of a fruitful and interesting expedition (or the frustrations and disappointments of a murky, drizzly day).

Collecting sites

The most promising shores are rocky, where the fierce action of the sea has worn away softer rocks, creating pools and sheltered crevices in which fish, crabs, anemones, molluscs, and other invertebrates will hide.

As the tide recedes, this slippery terrain becomes accessible to the aquarist, with the best catches being made further down the shore, where the rocks and pools are uncovered for only short periods.

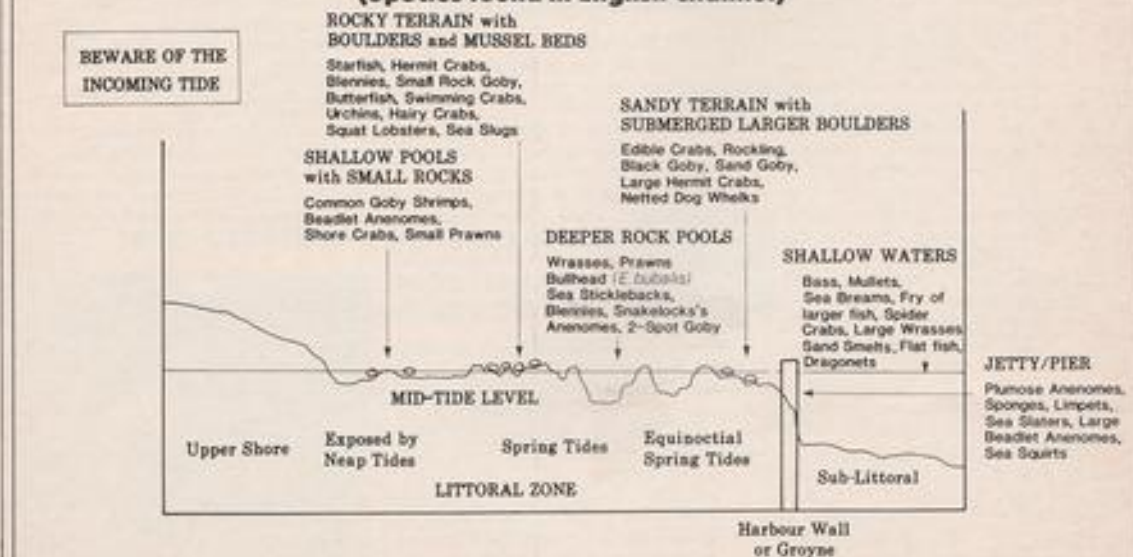
Shingle beaches are unsuitable. The rolling stones do not provide many convenient

niches for marine organisms. However, a shrimp net pushed along in shallow water over sandy ground may provide a small haul. As well as Shrimp, Hermit Crabs, and small Flatfish, you may also find the Little Cuttlefish, *Sepiella atlantica*, and Great Pipefish, *Syngnathus acus*.

Beware of the Weever fish, *Echlichthys vipera*. It is armed with a poisonous dorsal fin.

Estuaries and creeks provide another collecting area where small fish species such as the Sand Goby, *Pomatoschistus minutus*,

CROSS-SECTION OF A ROCKY SHORE (Species found in English Channel)



Sand Smelt, *Atherina presbyter*, and the fry and juveniles of larger fish, especially Bass and Grey Mullet, congregate in large shoals.

Preparation and Collection

After selecting a suitable hunting ground, the aquarist should consult the local tide tables, available at Ships Chandlers and Newsagents. Arrive at the shore at least one hour before low tide.

The most interesting finds are likely around the time of the autumn equinox, when the water recedes the furthest. Also, many of the fish and invertebrates will have bred the previous summer. The pools abound with diverse life forms.

In sandy pools, often quite high up on the shore, thousands of small Common Gobies, *Pomatoschistus microps*, dart across the shallow water, their sandy colours camouflaging them against the bottom. They can be scooped up in a small aquarium net. Shoaling in slightly larger pools are the similar Sand Gobies while Beadlet Anemones are found attached to rocks.

On rocky terrain and mussel beds, under stones in a very small amount of water, you will find Starfish, *Asterias rubens*, Blennies, *Lipophrys pholis*, and crabs, among a profusion of various creatures. Take care, the Swimming Crabs, *Liocarcinus* species, can produce a painful nip. Do not pick up a fish with dry fingers — tease the fish into your cupped and wetted hand. Do not forget to return all rocks in the same place as you found them.

Deeper pools nearer the sea, often with weed draping in the water, and craggy overhangs, are best fished with a prawn or pond net. Watch your shadow falling across the pool — it will send the denizens swimming or scrambling to shelter. In the English Channel during July and August, Small Wrasse and Prawns are common in these weedy pools. The same long-handled net can be used to sweep the shallow seas adjoining harbour walls and jetties. Good results can often be obtained at night, with the aid of torchlight.

It would be tempting for the aquarist to collect everything in sight, and release them all together in the tank. This will be disastrous. In the mayhem that follows you are likely to end up with one Shore Crab, after all the weaker creatures have perished. Many of the shore life forms are extremely aggressive, and the compatibility of each species is a serious consideration. Research into the nature and behaviour of each species, including previous articles in this series.

Collection is rarely straightforward. In winter, the specimens suitable for aquaria are often absent in estuaries and on the shore — the fish and crabs will have migrated to warmer, offshore waters.

Transportation

Inland aquarists have a serious problem. Collected seawater quickly turns toxic and unable to support life. In hot weather, this process may take less than one hour before the more sensitive fish begin to suffer. The deterioration may have, in fact, already commenced in the shallow pools themselves.



Dahlia Anemone, *Urticina felina*.



Shore Crab, *Carcinus maenas*. Ubiquitous on shore, but aggressive and destructive and is best omitted from the community aquarium.



Black Sea-Bream, *Spondyliosoma cantharus*, and Grey Mullet, *Chelon labrosus*. These fry shoal in their thousands, in southern estuaries during autumn.

GOLDEN RULES

To ensure the best practical conditions for your specimens the following rules should be complied with:

- 1 Choose at least one large bucket. Fermentation bins, capacity 3.3 gallons (15 litres) are ideal. The best colour is white. The smaller invertebrates and fish will be more easily found and retrieved from a white background. Supplementary buckets can be smaller. Keep special buckets for this purpose that have not been used for detergents, etc.
- 2 Collect the seawater from the sea itself, not from the rock pools which can be dilute, polluted, or deficient in oxygen because of natural conditions. Fill the bucket half full, and renew the water immediately before you start your journey home.
- 3 Segregate the anemones. Transport these home in a polythene bag, or separate plastic container, filled with a little water and damp seaweed.

- 4 Do not place stones or living rock in the bucket. The moving stones will easily damage the fish and invertebrates; as will large Hermit Crabs and Whelks.
- 5 Carefully inspect the captured creatures. Not only is an injured fish unlikely to survive in aquaria, but it could possibly die on the way home, polluting the water.
- 6 Segregate predatory fish, such as Bullheads, *E. bubalis*, which will swallow smaller fish in the bucket.
- 7 Do not overfish! Both an overcrowded bucket and aquarium will result in the demise of the occupants. See Article 3 (*A&P*, June, 1987) for recommended maximum stocking levels.
- 8 For journeys lasting longer than one hour, invest in a battery-operated air pump and clean airstone.
- 9 Include some red seaweeds or Sea Lettuce, *Ulva lactuca*, to provide shelter for the fish.

Most of the invertebrates will survive intact. Fish are more difficult.

Butterfish, *Pholis gannella*, are erratic. Rockling, despite being easy to keep in aquaria, are notoriously poor travellers. These fish are best transported in a separate bucket, with over one gallon of fresh seawater for each fish on long journeys.

Good luck and good hunting!

SPECIAL REQUEST

Living close to the sea, I have not experienced any difficulties in the transportation of marine fish over long distances. I would therefore welcome further observations and practical experiences from inland aquarists. Please mention the fish involved, how they were kept in transit, in detail, weather conditions, duration of journey, and for how long they subsequently survived in aquaria. Please write to Andy Horton, c/o *A&P*, enclosing a stamp for a reply. I will be pleased to answer any concise questions e.g. on identification of species from drawing or photograph, compatibility, etc. I would also be pleased to hear of your experiences, breeding, rarities, or anything about local marine life.

SOCIETIES TO JOIN

Marine Conservation Society, 4 Gloucester Road, Ross-on-Wye HR9 5BU.

British Marine Aquarists Association, c/o Paul Dance, Secretary, 34 Seymour Road, Captain's Hill Estate, Alcester, Warwickshire, B49 6LD.

USEFUL EQUIPMENT

Buckets, preferably large and white. Polythene bags, and small plastic containers; for Anemones. Large pond or prawn net. Aquarium net. Shrimp, or push net. Drop net; home-made from old bicycle wheel rim, and baited with mussel or fish skeleton. Dropped by rope into deep water. Torch.

Books

Cephalopods of the World

By: Kir N Neis

Published by: T. F. H. Publications, Inc.

ISBN: 0-86622-051-8

Price: £39.95

Many years ago, I found a small (1cm) delicate, loosely-coiled, porcelain-like shell washed up on a Mediterranean beach during one of my (then) regular beachcombing excursions. I couldn't believe a snail could produce a fragile, chambered home of such beauty... and I was right. Soon after, I discovered that the shell (sadly, damaged later by an over-enthusiastic admirer) belonged, not to a snail, but to a tiny cuttlefish called *Spirula spirula*, which, incidentally, is not found in the Mediterranean.

Ever since then, I've felt a very strong affinity for all cephalopods, especially for those possessing external coiled shells, such as the Nautiloids, the extinct Ammonites and Goniatites and, of course, *Spirula* itself.

I was therefore delighted to receive news of the impending publication of **Cephalopods of the World**. Having now seen a copy, I am immensely impressed by the thoroughness of the treatment and the extent of the range of species covered, which according to the by-line on the cover, includes illustrations of "every squid and

cuttlefish of the world". (In fact, it also includes all the known species of octopus). Going through the 329 pages of text, plus over 14 pages of bibliography and references, it is, indeed, hard to dispute this claim.

Cephalopods of the World falls into the same category as **Atlas of Marine Mammals** (see *A & P*, Feb. 1987, p30). Both books are translations of existing Russian texts and both deserve to become major reference works throughout the world.

It is difficult to fault **Cephalopods**, and why should I, when I think it is so good? Even so, I think I must qualify my praise of the book by pointing out that this massive volume is not aimed primarily at aquarists. It is a reference book and, as such, the majority of its excellent drawings have been produced with this in mind. In addition to the drawings (1396 in total), there are 39 colour photographs, and a few black-and-white ones, in the first section (84 pages). This part deals with the external and internal structure of cephalopods, and includes such rarely-seen species as the deep-water octopus, *Sasaroctenothia*, and its even more dramatic-looking cousin, *Grimpotenothia* (two real gems).

Being purely selfish, I would have liked to have seen a colour photograph of a *Spirula* gracing one of the pages. However, having seen photographs of this delightful species on several occasions, I am more than happy to settle for *Sasaroctenothia*, *Grimpotenothia*, and *Octopus dofleini dofleini*,



the giant Pacific Octopus which can attain a total length of five metres!

Despite what some holidaymakers may think (!), there's more to squid and octopus than the anonymous-looking chunks and rings you get on your plate on your Mediterranean visits. If you want to find out exactly how much more... buy this book!

John Dawes

WIN A plant fertiliser system from Everglades

Are your aquatic plants getting enough? Everglades Aquatic Nurseries have donated three plant fertiliser systems in this month's competition to ensure that they do!

Each system retails at around £12 and consists of three packages to provide everything your aquatic plants need to help them thrive: Everite Number 1 or Number 2, Everplant 'D' and Everplant 'M'.

If you are starting a planted aquarium from scratch, Everite No. 1 provides all the hormones and basic fertiliser for aquariums of up to 200 gallons.

Alternatively, if your planted

aquarium is already established, Everite No. 2 will also treat up to 500 gallons.

Everplant 'D' is liquid fertiliser containing vital trace elements for daily treatment of aquatic plants; while Everplant 'M' is a fertiliser in tablet form for monthly feeding.

All you have to do to enter is unscramble the anagrams below. Write your answers on a postcard and indicate whether you would like to receive a kit for an existing tank or a starter aquarium.

Don't forget to include your name and address, and send your entry to:



Everglades Competition, Aquarist & Pondkeeper (September), 58 Fleet Street, London EC4Y 1JU.

The first three correct entries drawn after September 30 will win the prizes.

ANAGRAMS

1. PLANET VERD
2. TREES PLAIN FLIRT
3. GROT O WORTH

Letters

Spitting Gouramis

I am writing about some strange behaviour I have observed in my Dwarf and Honey Gouramis (*Colisa lalia* and *C. channa*).

I bought the Dwarf Gouramis first and they immediately tried to spawn. The female was not yet gravid and needed feeding, but she was shy. I therefore had to melt a piece of frozen tubifex and, using a needle, place the worms individually in front of her nose. Both fish soon realised that the presence of the needle meant food.

Recently, I bought a pair of red Honey Gouramis and, as a break from "O" Level revision, decided to feed the fish using the tubifex on the needle. The Dwarf Gouramis knew what was coming and started to loiter round the hole in the condensation tray. The Honey Gouramis followed, and so did the Black Neon Tetras. The tetras, being very fast, usually nip in and

grab the food and, maybe because of this, the Gouramis did the unusual.

They began to spit water at the needle, dislodged the worms and then ate them. The water was fired as large drops to a height of 2-3 cms. The fish also leapt out the water to grab any worms which were hanging off the needle. This behaviour was like that of mini-Archer fish and is the first I have ever come across. I would be interested to hear of other readers who have similar marksmen of any species.

Robert Smith
Beaconsfield, Bucks.

Water Life Stickleback Badge Wanted

I wonder if any of your readers could help me. Before World War II, I subscribed to *Water Life*, which is now defunct. At that time, two lapel badges, enamel on metal, were available to readers, one with an

Angelfish design for tropical enthusiasts and, for coldwater enthusiasts, a gold Three-spined Stickleback on a green background.

I now have a very special reason for obtaining the Stickleback badge and have just about taken our house to pieces hoping to find my original one in some nook or cranny. But no luck. Could, by any chance, anyone put me in the way of acquiring one of these badges?

Niall Campbell
Pitlochry

Editor's Note
If any A & P readers can help Niall in his search, please drop me a line. Don't send the badge in in the first place, though. I'll be only too pleased to put you in touch with Niall.

John Dawes

Red Sea thanks

After the initial shock, came the realisation that I had been lucky enough to win the Red Sea Holiday Competition.

I am delighted and so is my husband, Geoff. To think that we are going to see coral reef fish in their natural habitat is marvellous.

It has always been our dream to go to exotic places and stay in lovely hotels, so I know we are going to have the time of our lives.

Thank you *A & P* for making my dream come true. Also, please thank all the other sponsors as well because I would not be going without you all, would I?

Patricia Mason
Knutsford, Cheshire

Editor's Note

Thanks a lot, Pat, for your letter. Now you can sit back and just mallow in the dream... which will soon become reality. We hope you and Geoff will have a super time in Eilat. We'll be pleased to pass on your thanks to Thomson Winter Sun Holidays, Isrotel, Coral World and Lucky Divers.

John Dawes



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FISHTANK PHOTO

Ever thought of photographing your fish? Have you ever tried . . . and failed? Liverpool-based aquarist **Ron Brown** explains how, with a bit of patience and commonsense (and without having to take a degree course in photography!) anyone can take decent photos in or out of doors.

(Illustrations by the author)

If you've got (or have access to) the following items, then without having to understand the technical problems of the relationship between Guide numbers, Film speeds, Dioptres, Focal lengths, etc, it is easily possible to obtain successful results (of which this article bears witness!) of your tropical fish. All you need are the following: 35mm SLR camera, flash gun, colour slide film (ISO 100), close-up lens (+2), and a little(!) patience.

Preparation is important

Before describing my own methods one or two points need to be made. The need to pre-focus is important as fish are generally active and you may have to move camera and flash gun, together, back and forth to keep the fish in focus. Try to keep as close to the fish tank as possible to avoid picking up reflections off the glass and, before you start, make sure that the glass is clean, inside and out. Try to avoid heaters, up-lifts, and airlines if possible but **DON'T** let this

deter you from taking what could prove to be a very interesting shot! Under these circumstances background 'clutter' makes no difference.

Even with apertures of f16, shoals of fish are difficult to portray as such properly because there will always be some too close and some too far back to be in focus. The best way to overcome this is in a small fish tank with a glass partition which you slowly move forward to the front of the glass, leaving the fish only an inch or so of space to move in. This method is also ideal for single specimens which are either too active or to shy to settle or show themselves long enough to be photographed.

Having previously determined, by trial and error (and you must do the same, for how else are you going to determine the best settings for the particular equipment that you have?) that 1/125th @ f16 is the best combination of settings for the equipment that I use (Nikon FM & FE and a Hanimex TB 655 flash gun GN 30 @ ISO 100; also a Hoya +2 dioptre Supplementary

Close-up lens) with the flash gun set to manual, I load the film in the camera, fit the close-up lens, then pre-focus on the species of fish that I want to photograph.

"Case histories"

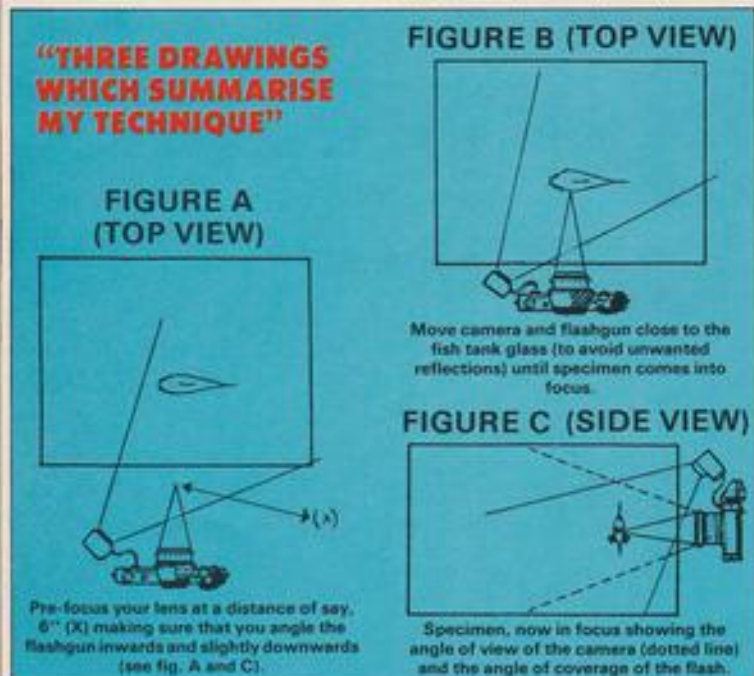
1 In the case of the Siamese Fighter I focused on that part of the nest which seemed to be giving the Fighter most bother, and me the best composition! I connected the flash gun lead to the camera which I held in my hand (I don't use a flash bracket as I don't have one) then, keeping the flash pointing downward slightly, I slowly moved both camera and flash forward until the pre-focused part of the bubble-nest I had chosen came into focus. I then patiently waited (less than a minute) during which time the Fighter came into the field of view several times. It was simply a matter of waiting for the best composition, at which time I took the picture.

What constitutes a composed photograph is arbitrary; I simply wanted the Fighter with, if possible, fins erect, tending to the nest which I got, which proves that by waiting, patience is not only a virtue but a very good money saver as well!

2 As for the Lionfish, an opportunity presented itself on a 'one off' basis to get some photos of them being fed. There were two in the same tank and a dead fish was offered. It was immediately taken head first; then, in three gulps, and literally as many seconds, the fish was gone! Without hesitation I quickly pre-focused on the other Lionfish allowing sufficient room in the viewfinder for any slight error of judgement as to exactly where the Lionfish might be. Another dead fish was offered which sank slowly to the bottom; as it was about to touch the bottom the Lionfish struck with amazing speed and took the fish head first, then swallowed it in an even faster, greedy manner.

3 If you find that you just can't get satisfactory results with flash, or you haven't got a flash gun, then you could quite easily use the lighting of your fish tank. The only fault with this method is the colour cast given to the photograph by the type of lighting used in your fish tank. The photo of the Pearl Gourami was taken using this method of lighting and, although the slight yellow cast is noticeable, it certainly isn't, in my opinion, objectionable.

4 If you still don't have any luck, then you can always take your fish outside and use natural daylight. All you need then is a camera, a small fish tank and some coloured backgrounds. Take the light meter reading directly off the fish or, if the species is small, then take the light reading off the



PHOTOGRAPHY



Patience (in this case, less than a minute) is not only a virtue, but also a money saver.



Certain types of aquarium lighting can produce a yellow colour cast. Even so, the results can still be quite attractive.

back of your hand. The best type of lighting is bright overcast conditions, but any lighting that will give sufficient depth-of-field will do. If you do choose this method, which would mean moving your fish around, it is important to remember that it is the cardinal rule of all wildlife photography that the well-being of the subject has priority. This apart, if your fish do become frightened, it will only show in the photograph, and photographs of pale coloured fish with closed up fins (unless they're sick) do nothing to enhance that particular species, or YOUR reputation!

5

If you've ever tried to photograph your living room in an attempt to show off your fish tank, the chances are that you have been disappointed because the fish tank (although the light was on) came out in the photograph as though it wasn't. This is because the living room required a shorter exposure than the fish tank.

If your camera has the facility to do double exposures then you're luck is in. Simply take a light reading off the gravel in your fish tank (in my case it was 1/15th sec, at f3.5) then mount the camera on a tripod at the opposite end of the living room, focus on the fish tank and set the controls to whatever your light meter recommended.



Double exposure living room setting using 1/15th sec. at f3.5, followed by a "bounce flash" — 1/125th sec. at f4. Camera: Nikon FE (28mm lens); Flash: Hanimex (GN30); Film: ISO/100.



One-off opportunities such as this feeding Lionfish, should never be missed.



This is my outdoor photography set-up. It works very well indeed.

Make the exposure, and then, without moving the camera, operate the double-exposure control, reset the shutter speed to whatever your usual shutter speed is for flash (1/60th?), and your aperture as suggested by the flash gun for the camera-to-fish tank distance (f4?). Then take a second exposure, and you should get similar results, as shown.

Closing thoughts

Having described my own methods which have consistently given me satisfactory results, I feel the only criticisms could be:

(A) The speed of the film, which is rather fast, but one has to consider the extra depth-of-field (area of sharpness), with flash, that this gives.

(B) Supplementary close-up lenses tend to take the edge off the quality but, again, one has to consider the advantage, this being that a close-up lens needs no correction to exposure as would extension tubes. You could, of course, use a Macro lens, but they are rather expensive. If you have one, or access to one, though, by all means use it.

(C) Lastly, be prepared for failures; they're bound to happen. When they do, study them carefully to find out why they failed. Was it out of focus? over-exposed? subject movement? Whatever it was, correct it and remember, practice + patience = perfect!

PRODUCT ROUND-UP

by Dick Mills

WATER QUALITY

Interpet's Nitrex + Water Guardian

The eventual formation of nitrate by biological filtration action is well known; this, together with the inherent nitrate level already in tap water (often above that considered harmful to fishes) means that nitrate levels continue to rise despite partial water changes. Should the oxygen in the water suddenly become depleted, there is a danger of nitrate being converted back to very toxic nitrite again. To combat this, NITREX filter medium has been proved to be an efficient method of removing nitrate by biological means.

Nitrex is not an ion-exchanger, nor a chemical filter nor a nitrate strainer. In essence, Nitrex (a specially prepared synthetic granular material) is exceptionally 'bacteria-friendly', so much so that development of the bacterial bed can only be described as 'explosive'. Aerobic bacterial processes follow the usual breakdown pattern — proteins-peptides-amino acids-ammonium-nitrite-nitrate — but due to their much increased activity, oxygen levels fall in the filter zone. Faced with this setback, the bacteria draw their required oxygen from the nitrite and nitrate compounds releasing free nitrogen gas to the atmosphere. Result?



The Water Guardian Starter Pack is designed to produce "the perfect environment for tropical fish" from domestic tapwater.

Less nitrate in the aquarium and a clear stimulation of plant growth. The paradox is that the system works best with low oxygen content (1mg/litre) and low flow-rate (20 litre/hour) through the filter. To facilitate the release of nitrogen into the air (and to allow oxygen to enter the water) the outflow from the Nitrex-equipped filters should trickle back from above the water level. A significant 'nitrite peak' may occur when using Nitrex for the first time but a rise of around 1.5-2.0mg/litre should cause no damage. If this level is exceeded, then a water change should be affected and the filter flow reduced still further.

Nitrex should be used on the basis of one

packet (200g) for every 200 litres of water and may be incorporated 'sandwiched' between usual filter media in any external filter body, or used in conjunction with a sub-gravel Nitrex Box. This ratio of 200g/200 litres should not be exceeded otherwise the influence on the water balance, especially at start-up, could be too great. The effect of Nitrex lasts about six months and the medium requires changing when it loses its rubber-like elasticity.

One problem of keeping fishes from foreign origins, especially from natural waters as opposed to commercial breeders, is that the fishes' water conditions are likely to be quite different from our own. WATER GUARDIAN from Interpet is a water treatment cartridge which converts tapwater into something approximating more to what the fish naturally expect. Although technically a selective de-ioniser, or water-softener, it does more by stabilising the pH and leaving trace elements vital to fishes' health unaffected. Test kits to assess General and Alkaline Hardnesses enable you to get the conditions just how your fishes want them — the results include new-found life, vigour and coloration, both in fish and plants. At around £9.87, this is a small price to pay for such continuing improvements. Further details about Water Guardian and Nitrex can be obtained from:

Interpet Ltd, Vincent Lane, Dorking, Surrey RH4 3YX (Tel: 0306 88103).

NEW RELEASES

Project range

The latest name in aquarium equipment to come from Italy is PROJECT. The main products are a comprehensive range of power filters covering three popular formats — outside 'hang-on' box type (PJB500), internal power heads (PJP400, 800, 1200), and external canister types (PJJ400, 600, 800). The serial numbers PJJ25, 50, 75, 100, 150, 200, 250 refer to a range of heater/thermostat units.

The self-priming PJB500 model has three compartments for efficient filtration of fresh- and saltwater; the low temperature, energy efficient (6 watt) motor won't overheat and delivers 500 litres/hour. The box filter accommodates most filter media cartridges on the market.

The PJP and PJJH Pumps and Powerheads are designed to work primarily with substrate biological filter systems and come in 400, 800 and 1200 litres/hour models with electrical consumption from 8 watts

upwards. Provision is made for injected aeration into the returning water flow. Again, maintenance-free, efficient and reliable motors are a feature of the range.

The canister-type power filters range (PJJ) has three sizes — 6, 8 and 11 watts, with an accordingly increased size of canister. With snap-on lids, screw-on hose connectors, the canisters appear to depart from usual Italian design by having no containers for filter-media, the whole filter body being utilised in a similar manner to Eheim filters. Silent-running, epoxy-filled motors deliver 400, 600 and 800 litres/hour.

The PJJ range of heater/thermostat units cover seven sizes from 25 to 250 watts. Totally submersible for freshwater and marine use, each is fully tested and guaranteed, and has a temperature adjustment control.

The Project range will be marketed in the U.K. by Eric Woods (Rosewood) Ltd, 45 Coalport Road, Broseley, Shropshire. (Tel: Telford (0952) 883408).

The Oxynet Revolution

A 'gravel-tidy with a difference' might be an apt, albeit a little trivial, way to describe a revolutionary new product just on the market. Apart from occupying a similar position in the substrate, OXYNET has little else in common with a gravel-tidy.

It consists of a mesh material coated with a conductive lacquer. When buried in the substrate, an electrostatic layer is built up by the action of the conductive layer and the natural elements present in the substrate. The amount of this electric tension also depends on the amount of conductive substances also dissolved in the water. The result of this is to release hydrogen (which bubbles out as gas) and oxygen (which dissolves back into the water). The development of reducing compounds such as hydrogen sulphide and ammonia is greatly decreased. Re-stabilisation of the aquarium after

periodic cleaning or treatment with medications is considerably faster.

The release of oxygen has several important implications: aerobic bacterial action is ensured and, when used in a pond, oxygen levels are actually enhanced during normally oxygen-poor periods such as 'ice-overs' and in warmer summers. With typical substrate additives, such as peat, or the use of commercial substrates, the biological effect of Oxyner is increased.

Oxyner comes in two mesh sizes — 10mm x 10mm for aquarium use (available in 30cm x 60cm, 30cm x 80cm and 30cm x 100cm formats); 40mm x 40mm for pond use (available in rolls of 50cm and 90cm widths). Oxyner must be used to cover the entire aquarium or pond base, an easy operation as a number of required strips are simply used, each strip not needing to be connected to the next one. Despite its 'electrical' operation, Oxyner needs no electric power and the only precaution to be taken is to allow a 4 to 6 weeks stabilisation period; this means that Oxyner should not be installed in ponds immediately prior to the onset of wintry conditions. In the aquarium, the stabilisation period is about 2 weeks. Active life appears to be around 4 years and tests have shown no ill effects after 7 years in pond usage. Fuller details about Oxyner available from: C. J. Skilton Aquarist, Gt. Gibbercks Chase, Butts Green, Sandon, Chelmsford, Essex CM2 7TR (Tel: Chelmsford (0245) 400535/400252).



Ancora — Italian Style

Junior aquariums are also in the news, this time from SACEM. The all-plastic 14in x 8in x 9in (high) is 'ready-to-go' with a built-in pump and filter accommodated in a false back to the tank.

Two switches are provided in the hood, one for the fluorescent light (also built-in) and one for a heater should tropical fish be kept. Maintenance is minimal; periodic rinsing of the filter medium is necessary only every two months or so.

Available in red, green, yellow, black and white, the aquarium will accommodate three or four small Goldfish or a small number of tropical fishes. The price is £49.50 (plus £3.50 postage and packing).

Telephone orders may be placed by Credit Card with the sole importers, PET MATE LTD on 01-898 7393 (24 hour) or

write to Pet Mate Ltd, Crane House, 32 Gould Road, Twickenham, Middlesex TW2 6RS. Further information, samples or transparencies from Chris Kirk on 01-755 1477.

Yorkshire Brine Shrimps

Ask any aquarist where Brine Shrimp eggs come from and you'll get the answer 'San Francisco or Great Salt Lake'. So they do, BUT adult Brine Shrimp also come from Yorkshire!

Yorkshire Brine Shrimp Supplies is an enterprising company turning out 75 million disease-free Brine Shrimp each week for the retail trade. Figures are staggering — 50,000 litres of culture water plus 30,000 litres in reserve produce 0.75 tonne per month of live shrimp. Containing 60% protein and rich in highly unsaturated fatty acids, the mineral and vitamin content of the shrimp is carefully monitored by Artemia Systems N.V. and the Artemia Reference Centre in Belgium.

Although dealing is normally restricted to Pet Trade and Retail outlets only, any bona fide operation (Universities, Schools, Research Establishments, Aquaculturists, etc) can be supplied with a door-to-door delivery 6 days each week.

Yorkshire Brine Shrimp Supplies, Unit 19, Cape Mills, Coal Hill Lane, Farsley, Leeds, West Yorkshire (Tel: 0532 55128).

Alarming News

If you are fortunate to have a fish-house it is more than likely you tend to specialise. Valuable fishes situated in converted garden sheds/greenhouses may be vulnerable. A new intruder alarm system has been designed by SOUND PROPERTIES LTD for such situations. The system operates from any 12v supply and gives 24 hours protection against vandalism and intrusion. The master control box is shock- and moisture-proof and emits an ear-piercing siren which can be heard over half a mile away. The complete system, even down to the necessary screwdriver, costs £99.00 including VAT and postage. Further details from: Anne Martin, Robert Hinton & Partners, Ramillies House, Ramillies Street, London W1 (Tel: 01 434 1244).

Phishy Philately

The Bahamas, Fiji and Jamaica have released stamps depicting, yes you've guessed it, fish. The 16 Bahamas stamps (face-value 5 cents to 10 dollars) show well-known tropical marine species; 4 stamps from Jamaica and 6 from Fiji depict Cone-shells also of likely interest to marine fishkeepers. Future stamp issues from Papua New Guinea, Western Samoa and Zil Elwanyen Sesel (outer Seychelles) will also feature fish and marine subjects.

Details of these and other fish-stamp sources are available from: Publications Officer, Crown Agents Stamp Company Ltd, Old Inn House, 2 Carshalton Road, Sutton, Surrey SM1 4RN (Tel: 01-643 3311).



Tahiti In The Atlantic?

Well, no and yes. The island proper is in the Pacific but the Tahiti Aquarium range has moved into the Atlantic by the simple means of calling its new aquarium the TOBAGO available in two sizes, T1 — 16in x 10in x 8in and T2 — 20in x 12in x 10in.

This new addition to the already successful Fiji and Hawaii models provides a quality framed tank for the junior hobbyist which is large enough for coldwater species, but can be updated to tropicals at a later date. The Tobago range comes with a free hood matching in colour the aquarium frames. It will accept other Tahiti hoods (including the Marina Fluorescent Hood with integral lighting system), and easily accepts all forms of filtration. Orders placed for the new product at the British Pet Industries Exhibition in April was very high due to the excellent packaging and presentation. Of course, the attractive prices — £11.95 and £13.95 for the T1 and T2 respectively — may also have had something to do with it!

For full details of the Tahiti range contact John Ratcliffe or Ralph Helman at Tahiti Aquariums on 061-273 7555.

STOP PRESS "Better" Amphibious Pumps

Following our item on the Amphibious range of pond pumps in the July edition of Product Round-up (see News from Norwood, page 5), we are pleased to inform readers that these highly respected pumps were designed by Blagdon Water Gardens as part of their extensive Better Water Garden Products range.

The pumps were originally manufactured by S.M.C., (who were part of Thorne-EMI, but are now part of the Myson Group), exclusively for Blagdon's. Distribution of the range is through several of the largest wholesalers in the country, plus numerous retail outlets.

For further information, contact Charles Maplethorpe, Blagdon Water Gardens, Bath Road, Upper Langford, Bristol, Avon, BS18 7DN. Tel: (0934) 852973.

TFH Change of Address

As from September 1st TFH Publications Ltd will be operating from: Cliveden House, Priors Way, Bray, Maidenhead, Berkshire SL6 2HP. Tel: (0628) 771944.

Coldwater jottings



Stephen J. Smith

Ideal for beginners

One of the simplest and most effective forms of filtration for the aquarium is, in my opinion, the undergravel filter.

Although considered by some people to be unsuitable for the coldwater aquarium — and especially for Goldfish — I have been running undergravel filters in several tanks of Goldfish for over a year with very satisfying results.

So I must express my personal delight that aquarium equipment suppliers **Rolf C. Hagen** have introduced an undergravel filtration kit specifically designed for Goldfish bowls.

The kit, featured as a competition prize in last month's *AGP*, has "everything for the beginner" — the only elements which the budding aquarist needs to add are gravel, water and, of course, a Goldfish.

Retailing at around the £8.00 mark, it also represents excellent value. Included in the kit are:

Undergravel filter plate with uplift; replaceable filter cartridge; an **Elite 800** air-pump with 20 inches of airline tubing; a decorative plastic plant; and even a packet of **Nutrafin** Goldfish food.

The Goldfish bowl itself is straight-sided and stands on a pedestal. In addition, the lid incorporates a transparent hinged "trap-door" for feeding.

As an introduction to the pleasurable pursuit of fishkeep-

ing, this kit is first-class. Surely far more newcomers to the hobby will remain as fishkeepers, rather than lose enthusiasm after the "first flush".

Full marks to **Hagen** — and all the other manufacturers of similar equipment: no longer need the Goldfish bowl be considered to be a "spherical torture chamber"!

Bristol show date

One of the largest shows in the coldwater calendar is held this month. The **Bristol Aquarists' Society Open Show** takes place at St Ambrose Church Hall, Bristol on **Saturday 12 September**.

Entries closed at the end of August, but the show is open to the public from 3.00pm.

Several hundred fish will be on display, while the standard of entries seems to improve every year; so it is an event which should not be missed.

An auction of fish will also be held during the afternoon, providing visitors with the opportunity of obtaining good-quality fish at reasonable prices from some of the country's leading hobbyists.

Plea from the heart

I have always been impressed by the front cover of an early edition of **"The Goldfish"**

edited by Paul Paradise (**TFH Publications**) which features a beautifully-coloured Calico Lionhead.

I was reminded of this photograph by a plea for such fish from Glasgow breeder, **Fergie Brown**.

Fergie's enthusiasm for the hobby has overtaken him, and he has recently formed his own coldwater business, **"Fancy Goldfish Scotland"**.

As he explained, "The public is not interested in inferior quality. The reason I started my business was to bring the very best of fish to Scotland through top-quality breeders in England."

It seems that Fergie has a very discerning public to cater for: "We have a large Chinese community in Glasgow who know their fish and who are entitled to the best."

He continued, "The new varieties of Goldfish coming into Britain are very exciting, particularly Telescopic Redcaps, Redcap Moors, Pom-pom Moors, Butterfly Moors, Black Lionheads and Hamanishiki."

However, there is one variety of Goldfish which Fergie would dearly like to obtain. "Is there anyone who can lead me to good quality Calico Lionheads?" he asks.

Perhaps readers of **Coldwater Jottings** can be of assistance?



Imaginative use of an old fibreglass rowing boat provided the ideal pond construction for Ken and Colin Whiting. Good job they didn't use a liner . . .!

Anchors away . . .?

The scope and ingenuity of pondkeepers never ceases to amaze me — whether undertaking a mammoth task of civil engineering to build a forty-foot Koi pond; or simply lining a wooden barrel with butyl to make a water feature for the patio.

Ken and Colin Whiting of Hayling Island recently sent me a picture of their pond . . . Look again at the photograph.

Yes, it really is a rowing boat!

The boat is made of fibreglass and is approximately four feet wide by nine feet long. Apparently, its use came about quite by accident.

"We had already dug the hole for a pond when we realised we had an old fibreglass boat which we had lost interest in," explained Ken and his son Colin, both members of **Havant Aquarist Society**.

"In a flash of inspiration, we decided that water would be held on the inside just as well as it is supposed to on the outside!"

An additional advantage is that the seats serve as shelves for planting. Let's hope that the fish never suffer from anchor worm . . .!

GOLDFISH BOWL FILTRATION KIT

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DECORATIVE PLANT
 Add an artificial look to your bowl. Comes in lightweight tubing, is heat-stable and has a realistic base of undergravel filter.

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WATER FLOW
 Water will pass through the gravel bed where impurities will be trapped, then it will flow under the filter plate and be drawn up the exhaust stem to the filter cartridge where the remaining impurities will be removed. The water returning to the bowl will then be clean and clear.

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News

Tetra Koi seminar at Liverpool University

Tetra, in association with the Zoological Department of the University of Liverpool are staging a one-day seminar on 'The Diseases of Koi'.

The seminar is designed to educate Koi-keepers about the needs of their fish, how to keep them healthy and overcome disease. Illustrated lectures covering the subjects of Koi care, disease diagnosis, treatment and prevention will be supplemented with practical demonstrations of autopsy and treatment methods together with a display of the major disease organisms of Koi. Three of the country's foremost experts of fish diseases and Koi will be giving these talks at the Seminar. Mrs Helen Bentley (well known writer and Koi expert), Dr James C. Chubb (one of the leading fish disease experts who heads the Fisheries/Aquatic Department of the University of Liverpool) and Dr David W. Pool (Head of the Tetra Information Centre).

The seminar is aimed at the whole range of Koi-keepers from interested novice to the specialist and everyone should gain from the day's proceedings.

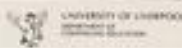
Historic agreement

In a historic agreement which will be of great importance to the International Aquatic Industry, the Singapore fish and plant exporters have combined to form one cohesive body under the umbrella of **Ornamental Fish International**, the world-wide organisation representing importers and exporters.

The signal for the agreement came at the **OFI General Assembly** in Singapore, which was held at the Mandarin Hotel between 21 and 23 May 1987.

Originally, there were two groups of fish and plant exporters, 17 who are OFI members, and the **Singapore Aquarium Fish Exports Association**. The combined number of exporters will be 35, representing 95% of fish exports from Singapore.

OFI President Keith Barraclough and **Tan Bok Yang**,



HEALTH AND DISEASE IN KOI CARP



SATURDAY 17 OCTOBER 1987

LIVERPOOL

The seminar will be held at the Continuing Education Centre, University of Liverpool on **Saturday 17 October 1987**. Thanks to sponsorship by Tetra the cost of admission for the entire day has been kept down to £7 per head. Admission is, unfortunately, restricted to 100 and will be by ticket only.

For further details, together with application form, please write to: **D. J. Manning, Department of Continuing Education, University of Liverpool, PO Box 147, Liverpool L69 3BX.**



Chairman of SAFEA, made a joint statement in which both said that they will work together closely for the betterment of the Singapore export trade and the International Aquatic Industry. All members of SAFEA will henceforth join OFI, and OFI members not within SAFEA will make application to SAFEA for membership.

The three-day Assembly was heralded as a great success with 85 delegates attending from 22 countries.

For further information, please contact: **Bob Rushton, OFI Secretariat, 4th Floor, Onslow House, 60-66 Saffron Hill, London EC1N 8QX. Tel: 01-831 9522.**

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At last an answer to the problems of quarantining and treating koi and other coldwater fish, without either a centralised filtration system or running water, with their obvious drawbacks.

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Good supply of fully quarantined tropical, coldwater and marine fish from world-wide sources.

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MAIN STOCKIST

News from the societies

Thorpe & District Aquarist Society

Following our item on the T.D.A.S. Open Show on this page, entries for the event were, reportedly, boosted to around

350. The "side show", consisting of aquatic stalls had been planned with a relatively small crowd in mind. However, to the delight of the organisers, they were packed out all day, with well over 2000 visitors.

Congratulations, Thorpe, on what was obviously a resoundingly successful day.

For further details of the society, contact Paul Sparks, 5 Gowing Close, Hellesdon, Norwich, Norfolk NR6 6PX. Tel: Norwich 406276.

Sunday 27 September. A full programme of events has been arranged, including a Fish Show, lectures, auction, banquet, raffles and disco. For further details of this highly successful annual event, contact Brian Tate, 92 Stonebridge, Orton, Malborne, Peterborough, Cambs. PE2 0NT.

East London Aquarists & Pondkeepers Association

E.L.A.P.A. is celebrating its 55th anniversary with the 39th Annual Breeders Open Show on **Saturday 26 September** at the Caterall Hall, Cecil Road, Chadwell Heath, Essex. The Show will be open to the public from 2.30 p.m. onwards. For further details, contact K. Stannard (P.R.O. and Programme Secretary), 135 Marks Road, Romford, Essex RM7 7AF.

Ilford & District Aquarist's & Pondkeepers' Society

The Ilford & District Aquarist's & Pondkeepers' Society's Annual Exhibition of Fish will be held on **17 October 1987** at the Ilford Town Hall, Ilford, Essex. Doors open at 11.00 a.m. (approx.).

The Society meets every second Monday of the month at Wanstead Library Hall, Spratt Road, Wanstead. Meetings commence at 8.00 p.m. and end at 10.30 p.m.

Membership Secretary: L. Smith, 80 Mighall Avenue, Ilford, Essex.

Boston Aquarist Society

The 2nd Open Show of the B.A.S. is to be held on **4 October**. Further details from the Show Secretary, J. Pagden, 38 Welland Road, Boston, Lincs. Tel: (0205) 66142.

Diary dates

Cardiff & District Fishkeepers Society

Cardiff & District Fishkeepers Society will be holding their Open Show on **Sunday 6 September** at the Star Leisure Centre, Splott Road, Cardiff. Full details from John Wilshire, (Show Secretary), 320 Ball Road, Llanrumney, Cardiff. Tel: (0222) 778629.

Salisbury & District Aquarist Society

This year's S. & D.A.S. Open Show will take place on **Sunday 13 September** at the Technical College, Southampton Road, Salisbury. This is a new venue with ample space and parking. For further information, contact the Secretary, Ivor Goddard, Victoria Cottage, 11 Pennys Lane, Fordingbridge, Hants. Tel: (0425) 52919.

Evesham Fishkeepers Society

The 5th Open Show of Evesham F. S. will take place on **Sunday 13 September** at Evesham High School, Evesham, Wores. For further information and show schedules, contact Kevin Harrison, 3 Manor Farm Cot-

tages, School Lane, Middle Littleton, Evesham, Wores. Tel: (03868) 31724.

Plymouth & District Aquarists & Pondkeepers Society

The PDAPS Open Show will be held at Trinity United Reform Church, Torr Lane, Hartley, Plymouth, on **Saturday 19 September**. Further details from the Show Secretary, P. Smith, 5 Beech Avenue, Cattedown, Plymouth.

Wyke Show Society

The 1987 W.S.S. Open Show will be held on **Sunday 20 September** at Endike Primary School, Endike Lane, Beverley Road, Hull, North Humberside. Benching: 12.00 noon - 2.00 pm. Judging: 2.00 pm. Raffle - Tombola - and Bfing-and-Buy. Further information from N. Woodward, 56 Portobello Street, Holderness Road, Hull HU9 3JF. Tel: (0482) 797384.

Northampton & District Aquarist Society

For details of the N. & D.A.S. Open Show scheduled for **20 September**, contact Mrs. B.

Adkins (Show Secretary), 179 Bush Hill, Weston Favell, Northampton, NN3 2PF.

Bristol Tropical Fish Club

B.T.F.C. will be holding its 27th Annual Open Fish Show on **Saturday 3 October** at All Saints Church Hall, Grove Road, Fishponds, Bristol. Show schedules and further information available from T. E. Davis, 264 Badminton Road, Coalpit Heath, Nr. Bristol BS17 2QW. Tel: Winterbourne 775432.



British Killifish Association

The B.K.A. is holding an International Convention and Annual General Meeting at Devonshire Hall, University of Leeds, between **Friday 25 and**



Naturalist's notebook

by Eric Hardy

A third British toad?

Is there a third British toad? The yellow-striped Natterjack has several, mostly English, haunts, its main breeding colonies being the shallow brackish duneland pools in the Southport area of Merseyside between Ainsdale and Birkdale, and between Formby and Hightown. Fifty years ago, I first published in the *Aquarist* finding occasional hybrids between Natterjack and Common Toads, but never fertile hybrids.

A Lancashire biologist came to see me and left his controversial thesis that, from controlled interbreedings, he had reared viable spawn to the free-swimming stage. Though work was initially in Manchester University Zoology Dept., this has not been accepted as adequate proof by other biologists who specialise in Natterjacks, and a dispute developed behind the scenes.

The stumbling block is that the hatchlings were lost in their free-swimming stage among the mass of tadpoles in the pools, and natural crossings probably rarely survive beyond tadpoles. Such crosses with fertile spawn have been reared in controlled experiments beyond tadpoles, but their fertility was not proved.

The Natterjack's yellow stripe is supposed to be specific recognition to avoid cross-breeding, yet fertile offspring have been produced by crossing it with six different striped North American toads, and fertile spawn has been produced in the wild and by laboratory-crossing the closely related female continental Green Toad with a male Natterjack, but not with the reciprocal sexes.

Common Toads spawn earlier in Southport dunes, and most if not all hybrids are between the female Natterjack and the small male Common Toad, probably during the nocturnal spring migration from winter hibernation-burrows to the often ephemeral spawning pools or slacks. Some females in spring droughts, when water was scarce, before more pools were scraped out, laid eggs on bare sand. The hybrid's eyes are more bronzy green and



Right, top view of a mature Common x Natterjack Toad female hybrid, showing the striped back and regular warts typical of Natterjacks. (Photograph: Eric Hardy)



Left, the belly of this hybrid female shows the irregular pattern usually associated with Natterjack Toads. (Photograph: Eric Hardy)

Right, a mature female hybrid from a female Common Toad x male Natterjack Toad cross. (Photograph: Eric Hardy)



skin-colour dark greyish-fawn; it usually carries the yellow back-stripe, but I have found some without it. It resembles the normal Natterjack's skin and warts, parotid gland and belly-pattern.

Many Natterjacks have been transplanted from these dunes to other parts of the country, without similar claims. Verdict of the jury: **possible, but not proven, and unlikely to establish a third toad in Britain.**

However, it is to be regretted that so much controversy behind the scenes between amateurs, professionals, the Nature Conservancy and the Herpetological Society is based upon personalities.

This year, over 500 Natterjack spawn strings were counted spawning at the Cabin Hill (South Formby) reserve pool and for the first time, over 1,000 at Ainsdale-Birkdale pools. Spring's dry spell checked spawning, but returning June rains saw it resume.

Miscellany

A good haunt of crayfish is the turbulent Dowles Brook, swinging its way as the boundary between Shropshire and

Worcestershire in the important Wyre Forest reserve. Turning over stones looking for them there this year, I thought how, fortunately, we don't have Florida's Glossy Crayfish Snake, *Régina rigida*, in this country! Miller's Thumbs, as well as trout, occupy this brook, a nesting haunt of dipper, kingfisher and grey wagtail. The terrestrial caddis-fly, *Emocylla pusilla*, has one of its few British haunts there. It is also probably England's best adder-haunt, and increasing otters, spreading down the Severn from Shrewsbury, bred four young there this year.

Other interests have included an albino Garter Snake in Canada and the courtship-scent used by our Crested Newt.

The recent discovery at Cincinnati University of the long-term storage of sperm in the oviduct of female turtles, recalls similar delayed implantation in bats and other mammals.

Tail-regeneration in lizards is apparently related to the breeding season and thyroid activity and vitamin A inhibits it in amphibians.

A new salamander, called *Desmognathus nelsoni*, has been described from West Virginia

by Kent State (Ohio) University; a new gecko, *Lepidodactylus yams*, from Taiwan's Lanyu Island, by Kyoto University, a new Chinese frog, *Amolops macrohynchus*, from Yunnan and a new desert snake, *Pseustes schokari*, from Sweihan in the United Arab Emirates.

Another interest is watching fish-behaviour "à la Konrad Lorenz" with the aid of polarised sun-glasses in pond, stream or tank. A careless football sends fish darting away from the vibration, though conversation doesn't usually disturb them.

Barb confusion

The classification of "barbs" has caused "barbaric confusion" for almost a century. Originally cyprinids, the "old" genus *Barbus* is now often called *Barbodes* in USA, some *Capoeta*, while a totally different group of unrelated *Corydoras* are called *barbatus*. In the pre-war aquarist press, Margery Elwin (Mrs Louis Mandeville) and Fraser Brunner engaged in academic rivalry over the naming of some rather similar barbs introduced before books bore any pictures or descriptions.

"Tiger barbs" sent to leading German and U.S. experts produced different identifications (we used to do this for fun). Trewavas, then in her early days at the British Museum, agreed their classification was somewhat chaotic and the museum had too few specimens to sort out claims which were really subspecies or local races.

Some of the troublemakers, like *partipentazona* and *siamotrenis* aren't even in modern lists like Axelrod, where their confusing ally *tetraodon* still stands.

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

Koi Food for Koi

I have been feeding my Koi (which I keep in a tank) on colour flake food, various freeze-dried foods and Koi pond sticks. Is this a suitable diet?

The selection of foods you mention should provide an adequate diet for your Koi. If you like, this can be occasionally supplemented by some form of live food. Several types of live food are usually sold at most fish shops and they make a pleasant change for fish.

Tropical Porch tropicals

Would you please advise me on the best way to keep tropical fish all year round in my outside rear porch?

If you use, at least, a 300-watt heater the tropical tank should be OK in the porch. A smaller model could be used in summer, of course.

Lag the back and sides with two layers of polystyrene ceiling tiles — this will stop any heat loss, except at the viewing panel. Even this could be covered with a temporary tile when the severe frosts occur.

Another dodge is to fit an airpump, but to site it indoors with a long airline. This will blow warmed air through the

tank. If the porch gets hot in summer, the same airpump can be sited outdoors to blow cooling air through the tank.

Filter charcoal... or is it coal?

Is wood- or coal-type charcoal best for aquaria? Either way, how often should it be changed? Also, what is the difference between the above carbon/charcoal and "activated" carbon? I have observed no differences between them.

Charcoal is charcoal whatever else it is named, whether for barbecues, aquariums or industrial use — there isn't a "coal-type".

Charcoal is formed by heating in the absence of oxygen and the type varies according to what is the original raw material.

Bones are often used and this gives the hard type you probably call coal. All the different woods give softer charcoal and these are preferred for aquarium use. The 'activated' form is ordinary charcoal heated just before packing to drive off absorbed gases. This makes it particularly active. If left exposed to the air, the activation is lost, but it can be recovered by reheating (slow oven).

In actual fact the advantage of the charcoal form of carbon is that it has an enormous surface area which can absorb gases, but that property is rapidly lost. In the flowing water of a power filter, the surface area

is also a site for nitrifying bacteria to grow — and it is this property that is the most useful for aquarists.

Therefore, use the barbecue or any other form of charcoal, so long as it is new, retain it loosely in a nylon bag (tights) and keep it in the power filter for years. Never sterilise it; just rinse in cool water to remove dirt but retain those bacteria.



A newly-caught Talking Catfish being held up (very carefully!) to avoid being injured by the long, and very strong, pectoral fin spines.

Talking catfish

I would be very grateful for any information on a fish I've just bought called a Hancocki.

Hancocki (not Hancock) is not a common name but a species name; the common form would be Hancock's fish. You probably have *Amblydoras hancocki*, the Talking Catfish, or Hancock's *Amblydoras*, one of the Doradidae or Spiny Catfish from South America.

This species is a nocturnal fish that feeds on small live

foods from the tank bottom. Hence (clean) Tubifex and chopped earthworms etc. are preferred. When fully grown it may also take small fishes. Amazonian conditions are best, i.e. soft, acid water and dense vegetation. There are no reported sex differences or breeding records, but the Doradidae often build nests in the substrate and guard the eggs.

Marine Reverse power filtration

I am thinking of setting up a 48in x 12in x 18in tropical marine tank. What sort of power-filter would I need for a reverse-flow undergravel filter?

Your aquarium has a gross capacity of 37.5 Imperial gallons. After making due allowance for freeboard at the tank's upper edge and seawater displaced by the filter-bed and living rock, etc., the net actual seawater volume will be of the order of some 34 to 35 gallons.

The filter-bed should consist of a 1-inch layer of crushed cockle-shell covered over with a 3-inch layer of coral sand.

The power filters needed to operate the two 23in x 11in U/G filters in reverse-flow mode should have a combined turnover rate of at least 100 gallons per hour, thus giving a nominal turnover rate of 20 to 25 minutes. The power filter should contain coral-gravel and

a marine-grade charcoal topped off with a 1-inch thickness of filter "wool".

Angels, Butterflies & Inverts

I have a 48in x 12in x 18in tank in which I intend to keep a sensible number of small coral fish (eg Angels and Butterflies) with, perhaps, one or two invertebrates like shrimps and anemones. Is this okay?

With such a small aquarium, I strongly recommend that you buy only Dwarf Angelfishes, such as members of the genus *Centropyge* and *Geniaacanthus*. Butterflyfishes of any genus other than *Chelmon* and *Forcipiger* would tend to eat your invertebrates and should not be stocked in an invertebrate aquarium.

Minimum Tank Size

What is the minimum size for a viable marine aquarium?

The minimum size of any marine aquarium, including the extremely useful quarantine/hospital tanks, should never be less than 36in x 18in x 18in (90cm x 45cm x 45cm), i.e. 42 gallons gross capacity (c 160 litres).

Coldwater Bad mix

I have a 24in tank in which I keep four small to medium-sized Goldfish, one 3in Goldfish, one Calico Pearlscale, one Ghost Koi, one Redcap and one Black Catfish. Recently my favourite Goldfish has started developing lumps and I thought it was being picked on. However, when I watched the tank for a while no fish was attacked by any other. Can you help? By the way, do I have a good mix of fish?

First of all, I was very concerned to read that you have a Black American Bullhead Catfish in your tank. This, I am afraid, is not a suitable species to house with Goldfish. It is a carnivore and even small specimens which are unable to swallow other fish will bite and worry them and can do a great deal of damage. In fact, if your Goldfish which has started to develop lumps is one of the

Fancy types, it will be slow-swimming and the Catfish could be responsible for the problem.

I suggest that the Goldfish be removed to another tank so that it can be under careful watch without risk of any infectious disease contaminating any of the other fish, though I strongly suspect who the culprit is. Antibiotics available from your vet may help cure the lumps.

I am also concerned about the number of fish which you have in your 2ft tank. Fish cannot stay healthy for very long if they are in any way overcrowded. The accepted rule for stocking coldwater fish in aquaria is 1 inch of fish to 24 square inches of surface area. This is the maximum, and less is much better, in my own opinion. Water quality is more likely to suffer in overcrowded tanks and this will result in outbreaks of fungus infections and other diseases.

Plants Aquatic Mosses

I have had great success in growing Java Moss in my tank, where it covers the rocks and bogwood giving a very nice effect. I was wondering if there are other mosses which grow underwater that I could buy.

Java Moss (*Vesicularia dubyana*) is a true aquatic moss from South-East Asia. It is capable of growing both immersed and submersed. It attaches itself to rocks and wood by means of organs known as rhizoids which are outgrowths of the stem but botanically are not true roots. There are over 135 species belonging to the genus *Vesicularia*, all found in the warmer regions of the world, with a few aquatic species from South-East Asia and Africa. However, these are

not imported and have not been tested for their suitability.

There are, in fact, 30 genera belonging to the family Hypnaceae. Well-known aquatic genera are *Amblystegium*, with 200 species, of which two are often kept in temperate aquaria, viz *Amblystegium riparium* and *A. kochii*. *Fontinalis* with 60 species, many of which are suitable for temperate aquaria, is also well-known to pondkeepers as it is frequently sold in leaded bunches as an oxy-

genator.

Other water mosses known to science, if not to the aquarist, include: *Wardia hygrometrica* (South Africa), *Hydropogon fontinaloides* (Brazil), *Hydropogonella gymnosoma* (South America) and *Drepanocladus aduncus* (Cosmopolitan in temperate areas). However, the chances of getting hold of rare tropical water mosses depends on collectors visiting warm countries and bringing back anything which looks promising.

COMPETITION WINNERS

Underworld Automatic Feeder Competition

The winner of our July Automatic Feeder Competition sponsored by Underworld Products is: Miss H. Wilcox, Flat 3, 48 Broadway North, Walsall WS1 2QQ.

The correct answers are: A (Spiny Eels) — b (bottom feeders); B (Tench) — a (scavengers); C (Hatchet Fish) — c (surface feeders).

How did you do? Thank you Underworld.

UNO Products Competition

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NEXT MONTH

If you are thinking of taking up marine aquarium keeping then you simply can't survive without our comprehensive **Beginners' Guide to Marines**. In fact, even if you are an established marine hobbyist, you'll find our Guide full of useful hints, with articles on:

- Setting up a fish-only tropical marine aquarium (Gordon Kay)
- The invertebrate aquarium (David Garratt)
- The native marine aquarium (Andy Horton)
- Growing seaweeds (Gordon Walker)

We also take an intriguing insight into one of the seas' most beautiful, but venomous molluscs, the Glory of the Sea, in the capable hands of Peter Elphick. Then of course, there are articles for Koi-keepers, coldwater hobbyists, tropical hobbyists etc.

not to mention our regulars, competitions and specially commissioned "One offs".... Plus a special from **Interpet**. Make sure of your copy by ordering TODAY.



FRED THE PIRANHA.

BY PETER McGEOUGH

BLIMEY BRUCE YOU DONT LOOK VERY WELL!

I'VE JUST HAD A BIT OF A SHOCK. THAT'S ALL



I WARNED YOU NOT TO EAT THAT ELECTRIC EEL, DIDN'T I!





A magnificent Omani *Aphanis dispar* male.

THE KILLIES OF OMAN

Bracketing Arabia's eastern corner, the Sultanate of Oman barely exists in aquarium literature. Before my visit there I searched for information regarding its fish population and found precisely nothing.

Prior to the present ruler, His Majesty Sultan Qaboos bin Said, taking control in 1970, there were only a handful of private cars and trucks, with 6 miles of paved road in all of Oman's 82,000 sq. miles. Here was one good reason why information was scarce. Or was the Omani freshwater fish population scarce?

I was to spend some 15 months in the southern Dhofar province, an area still within the Monsoon belt yet with a climate that was not unpleasant. From November to April it's warm and dry with noon temperatures of around 40°C (104°F), reducing to 23-25°C (73.5-77°F) at night. April to June is very hot, with June to September being the Monsoon period. Rainfall averages 2 to 3 inches annually but can vary greatly.

This area contained a vast store of animal life (mostly types of lizards and insects) that

There are few freshwater fish in Oman, but **Ray Hocking** of West Cornwall Fishkeepers found some among the barren, spectacular landscape of the **Jebel**.

(Photographs by the author)



This little Damsel had the incredible ability of changing colour from yellow and blue ... to black!

was soon to consume all my spare time. Only the odd afternoon was spent in camp writing notes, photographing insects and feeding Fred, a tame Chameleon, on cockroaches. Eventually, two sites shared my off-duty hours. One was a stream in the **Jebel** (mountains) the other the reefs at Raysut Bay.

The **Jebel** just after the Monsoon is an incredible place with some areas of great beauty. Several large pools of water attracted colourful dragonflies and superb butterflies yet seemed barren of fish. These pools dry out rapidly once the Monsoon ends and the **Jebel** quickly turns from green to brown.

But one stream remains; its water levels drop but it remains, and the plant life it contained was marvellous. It was here that I found my first and, unbeknown to me, last species of Omani freshwater fish.

Known locally as the Falaj Fish (Falaj being an aqueduct or water channel) it was obviously a Killifish, but which one?

A lively fish, the males were mainly silvery blue with vertical bars on the flanks reaching to the dorsal fin. From dorsal to nose they were spotted and possessed yellow pectoral and anal fins.

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The pools exposed by the receding tide at Raysut Bay held thousands of fish.



This was the only permanent stream I found during the dry season in the Jebel.



This brackish pool, used by cattle and camels, and breached by the tide during the Monsoon, contained *Aphanius dispar*.

Females were dull and clear-finned, with vertical bars that were somewhat indistinct. Young specimens seemed more green than blue. The largest specimen found, a male, measured some 50mm in body length. A water sample taken from the stream was tested and found to have a pH of 7.2 and a hardness of 120ppm. Temperature in the stream varied greatly. The majority of the aquatic plants, I had never seen before.

A letter and photograph sent to a friend in the British Killifish Association resulted in a quick reply, "*Aphanius dispar* I think — send me some eggs". Eggs were dutifully found in floating plants, regrettably sent in haste, and arrived squashed flat.

The *Aphanius* genus of fishes inhabits both fresh and brackish water, so the next logical step was to find some brackish water. The same species, identical in all respects, was found in a pool beside the beach, obviously brackish, together with some Mullet and some species of Puffer. This pool was breached by the tide during the Monsoon period. *A. dispar* were also found in a channel surrounded by limestone, again breached by the tide at the Monsoon. The water hardness was beyond the scope of my test kit. Used by both cattle and camels, the water was foul yet full of *dispar*. In this particular area there seemed few males.

Further research revealed that, although *A. dispar* are widespread throughout Saudi Arabia, Bahrain and Iraq, the Omani *dispar* "seemed" different in pattern, coloration and possibly fin shape and size — although with only photographs to go by, I can be far from certain.

On my first trip home my holdall contained something far more precious than my "Duty Free". Covered well in towels were two large plastic bags containing 2 adult pairs and 20 juveniles. All survived the journey and were entrusted to my friend Brian Sell of the B.K.A. Sadly, all the

young fish perished in a matter of days. However the 2 adult pairs spawned within a week in floating mops with the eggs hatching in some 10 days.

Little did we know at that time that, despite bringing more *dispar* home 5 months later, our efforts and those of another B.K.A. member entrusted with some fish, were doomed to failure. No fry were raised to maturity and no sure reason found. At this time I believe there are no longer any Omani *A. dispar* in the UK.

Tailpiece

Raysut Bay was, pardon the pun, a different kettle of fish. A coral sand bay with a dead coral reef on one side, it produced many different habitats. The reef itself was uncovered at low tide and innumerable pools held thousands of fish. My one regret was not investing in an underwater camera.

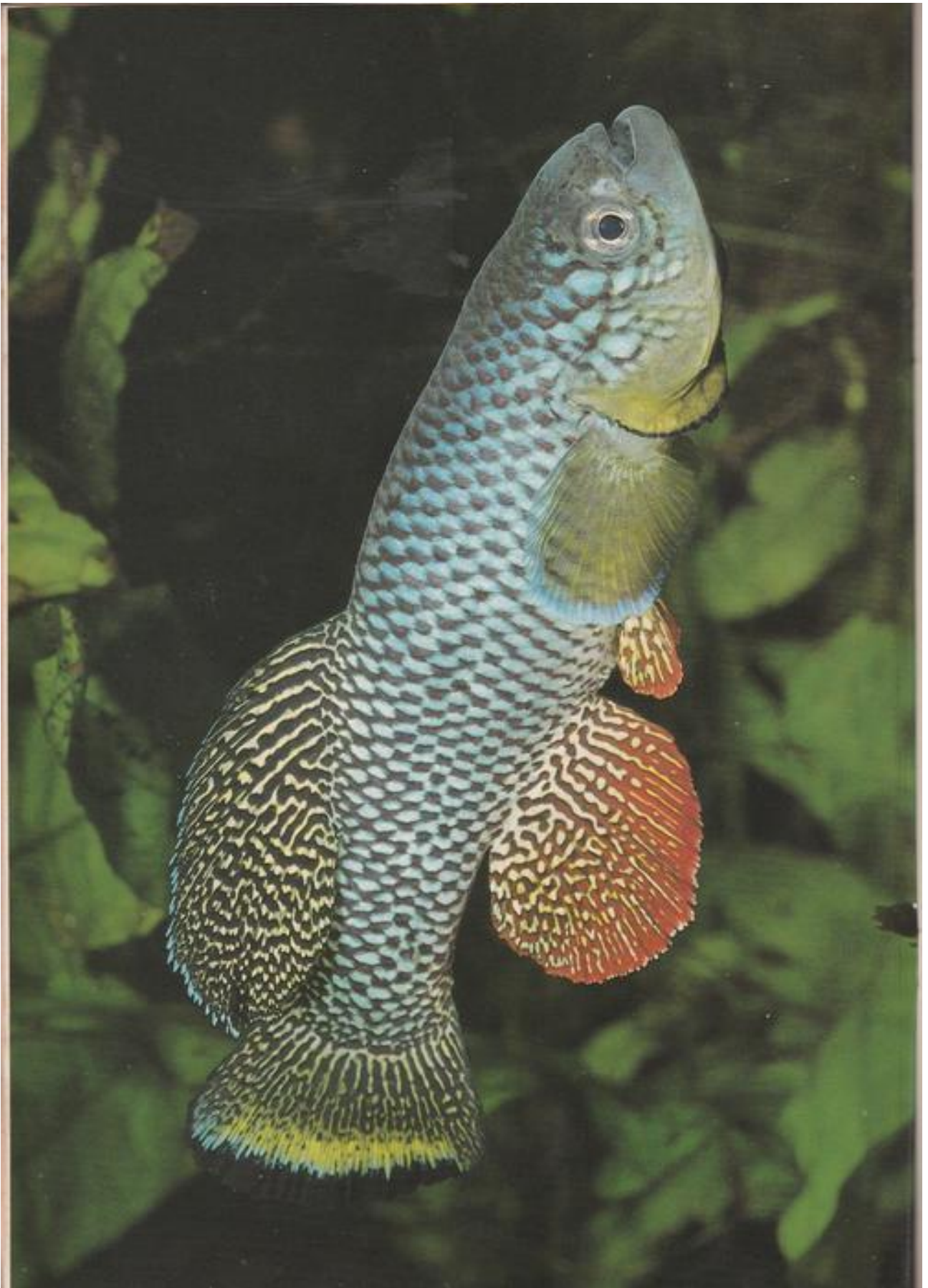
One particular fish abounded here. Resembling a Damsel in both shape and temperament it looked stunning in blue and yellow until you realise that your specimen is changing colour... to black! I still don't know what it is.

The opportunity to work abroad was one worth taking; the opportunity to see fish in the wild made it irresistible. I learned and saw a great deal with my fishkeeping background acting as a great asset.

Seeing small Batfish swaying back and forth like seaweed caught in a current fascinated me. Adult specimens left me speechless. Butterflies and Surgeons in their natural environment show their tank confined brethren to be a poor pale comparison.

One "ex-patriate" became as hooked as I and I remember well an urgent knock on my door and his smiling face: "I've caught two fascinating fish here", he said producing two plastic buckets. One contained a superb 12in Volitans, the other resembled a Stonefish. I went pale...

**FOCUS
ON KILLIES**



Spotlight

**Nothobranchius furzeri,
Jubb 1971**

Rod Roberts, Chairman of the British Killifish Association, gives expert advice on the care and breeding of the colourful *Nothobranchius* genus in general, and the short-lived but highly desirable *N. furzeri*, in particular. (Photograph by Arend van den Nieuwenhuizen)

Nothobranchius species inhabit the Eastern countries of Africa, ranging from Somalia to the Northern parts of South Africa. They are all true annual species, which means the habitats where they live are subject to drying up completely. So, to perpetuate the species, they have evolved the method of laying their eggs in the mud, etc. to await the onset of the next rainy season. Not all the eggs will hatch when the rains first arrive, though. Should this be a freak storm with enough water to hatch the majority of the eggs but not enough to last the fish to grow to maturity and start spawning again, resting eggs are laid, which will not hatch on this first wetting. Should the rains be exceptionally late, or not come at all that year, these resting eggs will lay dormant in the substratum — a truly amazing phenomenon.

The first *Nothobranchius* described was by Peters in 1844 — this was *Nothobranchius orthonotus*. Much work is still going on with the genus: name changes are taking place; new species are being described, and some species are waiting to be named. Over the last ten years or so many new species have entered the hobby, and some already-named species have been rediscovered, mainly through the efforts of the Netherlands and German hobbyists who have collected specimens and have been successful in bringing them back to Europe alive, and breeding them.

The breeding tank

A tank 18in x 8in x 8in is quite suitable for breeding *Nothobranchius furzeri*. Generally speaking, I think most Killi keepers use this size tank, but if your's is bigger, so much the better. *Nothobranchius* are not fussy as to water chemistry (pH, DH, etc.) — they seem to do as well in hard as in soft water. Regular water changes should, however, be done; at least half every two weeks should be changed for fresh water.

Spawning & egg care

The best spawning medium is Irish peat moss. This has no additives and so is perfectly safe for the fish. Break the peat up and boil it in an old saucepan. After boiling, I always rinse the peat, a small amount at a time, under the cold water tap; this removes all the very fine dust. If you don't do this the water will be very cloudy for a few days, and, while this does not harm the fish, it

does stop you being able to observe them. Add peat to the tank to a depth of approximately ½in.

Nothobranchius are peat ploughers, unlike the South American annuals which are peat divers, the difference being *Nothobranchius* swim just above the peat, with the male then wrapping his dorsal fin over the female as they push one egg at a time just below the surface of the peat. Divers actually mate down in the peat.

The peat can be removed when you do a water change and fresh peat is added to the tank. To remove the peat use a net and wring the peat out in your hand to remove most of the water. Don't worry about damaging the eggs; all Killi eggs have a very hard shell so you will not harm them. Lay the peat on newspaper for further drying until it is just slightly damp, but crumbles easily. The peat is then stored in sealed plastic bags. Make sure you write the species name and, either the date of drying, or date of expected hatching on the bag.

Eggs must now be stored, and temperature plays a significant role as to when the eggs will be ready to hatch. The lower the temperature, the longer it will take, the optimum temperature being in the high 70's°F. Various methods can be used to achieve this temperature, i.e. airing cupboards, the warmest part of the fish house/room, or a heating cabinet heated with a light bulb and controlled by a thermostat.

Hatching & fry care

We will assume that the eggs have reached the date when they are ready to be reimmersed in water. Open the bag of peat and find the eggs. Then, with a magnifying glass, examine them to see if they are 'eyed up', which means you can see the eyes of the fish inside the eggs. If they are ready to hatch, fill a tank, depending on what size you have available (I use an 18in x 12in x 6in) with about 4in of aged water, and add one teaspoon per gallon of cooking or sea salt (not table salt which is iodised) to help prevent Velvet disease developing, the main disease to which *Nothobranchius* are prone, and to prolong the life of the brine shrimp which will be the first fry food.

Once the peat is tipped in, eggs will start hatching within a couple of hours. Of course, you should already have your brine shrimp hatched as the fry are able to consume this food straightaway.

A day or so later I add Red Ramshorn

snails to the tank; these will consume any dead brine shrimp. After a week or so, the fry can be moved to a bigger tank, and the peat re-dried and bagged up once again to be re-wetted about a month later. As I said previously, not all the eggs will hatch the first time, so this procedure can be carried out until no more fry hatch. I never re-use the peat just in case there are still resting eggs in it.

With regular water changes and good feeding *Nothobranchius* grow at a very fast rate and should start to spawn at 6-8 weeks.

Looking after *N. furzeri*

Nothobranchius furzeri is a very short-lived species, a three-month lifespan being about the average, so, as you can imagine, the fry must grow very quickly to reach maturity. The males are very hard drivers towards the females but never seem to inflict any damage. Even if you provide the female with cover to hide in the male always seems to find her, so it is advisable to give her a rest frequently.

All types of livefood are taken and these are certainly preferred to dried foods. In fact, in most cases they will ignore dried food no matter how hungry they are. I have had hatchings of *Nothobranchius guntheri* relish dry food, but this is the exception. Foods preferred are mosquito larvae, glassworms, bloodworms and of course, Tubifex worms, and white worms in moderation. I am talking here, of course, of semi- and adult fish, not fry.

Eggs are collected and stored in the way mentioned above for all *Nothobranchius* species. This fish has a short lifespan, suggesting that, in the wild, habitats must dry up very quickly (meaning a long dry period). Eggs that have been stored in the 80's°F should be checked for development after two months and wetted if development is noted — although, when this species was first available, the incubation time for the eggs given was five to six months.

As can be seen from the photograph, *N. furzeri* is a truly beautiful fish. It is not too demanding for the aquarist, but is, unfortunately, seldom seen in dealers' tanks. At the moment though, they are readily available within the British Killifish Association.

Should you need more information on the British Killifish Association write to: The Publicity Officer, Steve Davidson, 34 Burchells Green Road, Kingswood, Bristol BS15 1DS.

'PIRÁ-BRASÍLIA'

The Lyrefinned Pearlfish — *Cynolebias (Simpsonichthys) boitonei* (DE CARVALHO, 1959)

Spectacularly beautiful, and endangered — just two of the many labels which can be applied to *Cynolebias boitonei* in this comprehensive article from Czechoslovakian schoolteacher and Killifish enthusiast Jaroslav Kadlec. (Photographs by the author)

The Lyrefinned Pearlfish was discovered and scientifically described in 1959, during construction of the new Brazilian capital, Brasília. At that time, the monotypic genus (one containing a single species) *Simpsonichthys* (DE CARVALHO, 1959) was quoted. Nowadays, the Brasília Lyrefin is included in the genus *Cynolebias* (STEINDACHNER, 1876) — although no other species in the same genus have missing pelvic fins.

Natural history of *C. boitonei*

An original scientific description of the species was published in the paper by de Carvalho, A. L., in 1959: *Novo gênero e nova espécie de peixe anual de Brasília, com uma nota sobre os peixes anuais da baixada fluminense, Brasil. Bol. Mus. Nacional, Rio de Janeiro, n.s., Zoologia 201: 1-10.*

The original discovery of the Lyrefinned Pearlfish was made by Jose Boitone, the Director of the Zoo of the capital of Brazil, in whose honour the species was named. The original genus, *Simpsonichthys*, was selected after Charles J. Simpson, a friend of Dr. Carvalho, who lived in California.

In Brazil this beautiful Killifish is called "Pirá-Brasília".

E. K. Bastos presents four localities for the occurrence of *C. boitonei* in his paper (see ref. no. 9). All four localities occur within a small area of approximately 10km² at the southern margin of Brasília, at the confluences of C. Pires and C. Guara Rivers with the Riacho Fundo River. They all occur at an elevation of about 1,000m above sea level.

The locality where this species had been discovered (Terra Tipica) no longer exists in its original form as it was used as a site for a Zoo. Another three localities differ from each other in humidity round the year, as well as in their vegetation. Despite the fact that E. K. Bastos investigated approximately 50 other localities during the last several years, where *C. boitonei* could occur, he has not been successful at all.

1 Campo Unido — a regularly dried-up swamp. The flora occurring here includes *Accolepis brasiliensis*, *Caladium striatipes*, *Eryngium ebracteatum*, *Eryngium* sp., *Gaylussacia goyazensis*, *Leucothe chlorantha*, *Parpalanthus* sp., *Recksteineria spicata*, *Rhynchospora* sp. and *Xyris*.

2 Brejo Graminosa — this similarly-looking swamp, lies between a wet slope and "gallery-type" woods, through which the Riacho Fundo river flows. It does not



Above, male *C. boitonei* are truly magnificent when in full breeding colours. Right, during spawning, the male leads the way as the pair dive into the layers of peat where the eggs will be laid.

dry up completely. The same flora occurs as at the first locality, but with different "gramineae" growing through, as well.

3 Brejo de Ludwigia — these are swamps that lie near the second locality. A characteristic plant here is *Ludwigia brachyphylla* which attains a height of up to 180cm. Also, considerably smaller flora, such as *Rapanea umbellata* and *Sclerolobium paniculatum* occur here. This swamp does not dry up entirely at any stage throughout the year.

In all the localities where *C. boitonei* occurs (even in its homeland) it is very rare. Moreover, during the last twenty years its numbers have decreased rapidly. Other non-annual fish species have been found here, i.e. *Rivulus punctatus*, *Hyphessobrycon darwini*, *Cheirodon* sp., *Characidium fasciatus* and *Aequidens portalegrensis*. Another four fish species were put into this habitat by man. They reproduce very quickly and thus violate the ecological balance, which has been one of the causes responsible for the rapid decrease in numbers of *C. boitonei*. The introduced species are: *Poecilia reticulata*, *Xiphophorus helleri* (various colour combinations), *Tilapia rendalli* and *Lepomis macrochirus*.

Other factors that contribute to the sad situation that the Lyrefinned Pearlfish is in a danger of dying out, are as follows:

- Draining of the swamps at the margin of the town of Brasília, followed by the establishment of the "grocery" plantations;
- Construction of communications;
- Increasing the area of the Zoo;
- Chemical pollution of water by washing off of artificial manure; and, finally,
- Flooding of rivers containing contaminated water.

At all three localities low water level is



usually represented by a depth of 25cm, while in dry periods, the soil is usually only wet locally. The pH fluctuates from 6.9 to 7.2, the dKH between 1.2 and 1.9 degrees. The CO₂ content varies from 25 to 38mg/l, and the oxygen content is pretty low, i.e. 1.8 to 5.2mg/l.

Life cycle of *C. boitonei*

The life cycle of the Lyrefinned Pearlfish is approximately as follows in a nature:

The spawning period lasts from April to May. The end of May marks the beginning of the dry period which lasts until August. (During this period there is practically no rain at all). Development of eggs in nature lasts 60 to 100 days, with the first fry hatching at the beginning of the rainy season, in August to September. By the middle of November, the youngsters are 2 to 3cm long and the old population is already dead, even if it is in a place which is permanently underwater.

Male/female characteristics

Males of the Lyrefinned Pearlfish grow up in my aquarium conditions to lengths from

36 to 41mm. If I keep developing or mature males together in a single aquarium then, despite a relative level of tolerance, one of them is regularly dominant, i.e. the longest one (the best-coloured one) that is several millimetres larger than others. If this male is removed from the aquarium its position is, in a short time, taken by another male. Females of *C. boitoni* grow up to lengths from 27 to 30mm. These figures are based on my own measurements taken from specimens which I have reared.

The basic colour of the male's body is brown-red. This colour is light when the fish is in a quiet mood but becomes darker, to reach dark violet, when he becomes excited. In the described basic colour, the male also has light green luminous stripes, dashes and spots that occur on its head, its sides and on all non-paired fins. The pectoral fins are bluish. The Lyrefinned form of dorsal and anal (anal) fins gave this Pearlfish its popular name.

The female is light yellowish brown, striped with 11 to 17 brownish-violet vertical stripes. In the middle part of the sides most of females of this species have 1 to 3 dark violet stains, or patches, when they are mature. The fins of females are generally round and transparent while their bodies do not have any of the luminous stains or patches which males possess.

Aquarium care

A basic condition of successful breeding and keeping is, as in case of other Killifish, living, or at least fleshy, nourishment. *C. boitoni* uniformly prefers grubs of water insects. Its favourite delicacy, according to my own experience, consists of Phantom Midge larvae (*Chaoborus*). Most of the year, though, I feed them with Tubifex worms, *Cyclops* and *Chironomid* larvae. As a treat I also feed them with cooked or rare lean meat or, occasionally, also filler! The last-named "substitution" particularly, is relatively well accepted by all South American Pearlfish.

I feed in the following way: I rasp the frozen fillet, just like a carrot, to fine "vermicelli" which I then put into the aquarium where they thaw out virtually instantaneously. Be cautious not to overdose, though, since if this food is not consumed within 10 to 30 minutes, it very quickly decomposes and consequently pollutes the water.

C. boitoni is not fussy as far as the salt content in the water is concerned. Commonly available drinking water, medium-hard, is suitable both for keeping and spawning. From the pH point of view, I would recommend neutral to slightly acid water, as this corresponds to natural conditions.

In the homeland of the species, temperatures during the year fluctuate widely, i.e. from 6°C to 38°C. Thus, there is no need to be worried about this species in case of unpredicted temperature changes. It seems to me that their maintenance is optimal, however, at temperatures from 22 to 25°C, when the Lyrefinned Pearlfish is most active in every way. At temperatures around 28°C they start to become weak and their activity decreases. They are quite able to

withstand very low temperatures, though, as I can document by the following experience:

In the autumn of 1983, when I had a lack of females of *C. boitoni*, Ladislav Smidl sent me four specimens from the Village of Horsice to the town of Brno (a distance of approximately 300 km). The fish were in the post for three days. After receiving the shipment, I found that the temperature of the water in the plastic bag containing the fish was only 9°C. Yet, all the specimens were alive. Of course, I do not know for how long the fish were exposed to this low temperature, but even so, the majority of aquarium fish would not survive such an experience.

Breeding *C. boitoni*

The breeding aquarium for this fish should have a dark-coloured bottom and back formed by using either boiled coal or peat. Several leached roots or pieces of a dark wood should also be added.

The tank can be planted with common aquarium plants such as *Cryptocorynes* or with water ferns such as *Microsorium pteropus* and *Bolbitis heudelotii*. None of these water plants require intensive illumination and all are suited to slightly acid water conditions. Allow 3 to 5 litres of water for each Lyrefinned Pearlfish, but it is not necessary either to introduce air or filter the water! It is sufficient just to exchange a part of the "old" water with "new" which has been allowed to stand for a day or so, from time to time. For breeding purposes I place the breeding pair (eventually a male together with several females) in an aquarium containing 8 to 15 litres of water, with a small dish containing a 5 to 10cm deep layer of fibrous peat. Pearlfish can spawn among plants as well, (eg) among a tuft of Java Moss (*Vesicularia dubyana*) or among the dense roots of the fern *Microsorium pteropus*.

Early on the male can be seen alternately stretching out and contracting its unpaired fins and vibrating his body. Its colour gradually gets darker as he entices the female to spawn. The male "stands on his head" and, if the female is interested, both fish disappear — in mutual physical contact — into the peat, or other suitable hiding place, where the laying of the eggs and their fertilisation take place.

Egg & fry development

The Lyrefinned Pearlfish is not a very fruitful species, with one female laying no more than 20 eggs weekly.

I usually incubate *C. boitoni* eggs in half-dry peat. But, according to D. Katz — (see ref. 4) — development of eggs is also possible in water.

The time of development of the embryo oscillates between 7 to 10 weeks in half-dry peat — the quickest of all the species of the genus *Cynolebias*. I have noted some dependence of development time on the average temperature at which they are kept, though: 28°C... 47 days, 24°C... 58 days, 22°C... 65 days.

For the soaking of the peat containing the eggs I use normal tap water which has been left standing for a few hours, at about 17-

20°C, pH 6-7, and total hardness 5-15°dGH. Fry hatch in 5 to 30 hours following soaking in water.

Young fish of good quality measure 6.5 mm after hatching out (ie) they are relatively big. They also have a dark-coloured body. Fry of *C. boitoni* of good quality hatch, however, from no more than 50% of the fertilised eggs. I suppose some embryos are just not able to tear up the egg membrane. Another percentage (approximately 15%) of the young get out, but are not able to fill their swim bladder. Therefore, they don't swim normally and perform "jumps" on the bottom. These are the so-called "belly sliders". It is interesting to note that the percentage of "belly sliders" grows if we delay the soaking of the eggs too long.

Feeding Lyrefinned Pearlfish fry is no problem: immediately after coming out they take brine shrimp nauplii (*Artemia salina*) and *Cyclops* nauplii and, after one week, are quite able to eat Grindal worms (*Euchrytraeus bickhoffi*). During the first week of their life they grow to a length of 8-9 mm and, by the end of the next week, they are 12-14 mm long. At 6-7 weeks they measure about 2 cm and we can already distinguish the young males and females. It is then that the first attempts at spawning begin.

Young Lyrefinned Pearlfish grow to full size in about 15-18 weeks, depending on water temperature and, above all, the quality of feeding.

C. boitoni reach their maximum age at 9-12 months, the exact time depending on average breeding temperature (higher temperature shortens their lifespan).

Closing thought

Cynolebias boitoni is the star among Killifishes. I personally think that it is the most colourful species of South American annuals in the family.

All the successful breeders of Lyrefinned Pearlfish should offer some young pairs to other persons who are interested in this fish. Maybe, in the future, aquarium broods will help to secure the further existence of the species. In any case, irreplaceable damage would be done if, at some stage, the "Pirá-Brasília" were to disappear from the surface of the earth.

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PERSONAL THOUGHTS ON WATER ECOLOGY FOR KOI-KEEPERS

"Resident" Koi expert, John Cuvelier, launches a few thought-provoking views on water — in his own inimitable way.

Many inexperienced Koi-keepers come to grief in their early days of learning how best to look after their beloved fish owing to a lack of understanding of that most basic of substances, water. I hope in this article to remove much of the undeserved mystique which has grown up around this subject over the years and, in as non-technical a manner as possible.

Starting with the raw material, the stuff which 99.9% of hobbyists obtain from their kitchen taps, (the remaining few getting their supplies from natural springs etc., and which can have their own peculiar problems!), we need to remember that, before reaching our taps, water has been treated, purified, and tested in order to ensure its suitability and safety for human consumption. Its suitability for the keeping of fish for pleasure does not come within the brief of the various water undertakings.

Fortunately, this fact should not, under normal circumstances, worry the hobbyist to a great extent as the majority of chemicals used in water treatment are so diluted by the time the water reaches our pools as to pose no threat. Of course, there is always the odd exception to the rule, and modern technology being what it is, it is not averse sometimes to the odd hiccup, resulting in a slug of Chlorine or some other 'nasty' making an unwanted appearance at our taps. (More on this later).

pH

Possibly the most well-known (and least-understood) item in the vocabulary of the fishkeeper is pH ("Potential Hydrogen"). This is merely a fancy title for the yardstick used in deciding whether or not water (or soil, or what-have-you?) is acidic or alkaline. For the Koi-keeper, this is important as Koi are most happy in a pH range of 7 to 8,

although they will tolerate a small divergence from these figures, preferably in the upward direction. The pH scale has a logarithmic characteristic so that a change of pH0.1 represents a much greater change than the figure suggests, a point which should be borne in mind!

It is most unusual for an established Koi pool to have a reading of below pH7, such a situation pointing to some imbalance of the pool environment. The pH can be raised by means of introducing some limestone chippings somewhere in the filter chain, but care must be taken not to overdo the process in preference to curing the root cause which could possibly be an inefficient filtration system. Should your pool have an exceptionally high pH, the situation becomes a little tricky as adjustment by means of adding an acidic agent is not really recommended. Tests should first be carried out to ascertain whether the alkalinity is due to, say, stonework in the vicinity which may be subjected to rain 'runoff' into the pool. Waterfalls around pools are a common source of alkalinity problems and, during construction, all mortar joints should be proofed to prevent any lime from leaching out.

Chlorine and chloramine

Chlorine and chloramine, those dreaded words, need some clarification. Chlorine is added before, during, and after treatment at the waterworks to kill any bacteria harmful

JOHN CUVELIER



Left, an electronic pH test set.

Below, a selection of test kits. Left: "Professional" pH and chlorine test kit of the comparator type (note discs); Right: Hobby-type nitrite and ammonia test kit from Tetra; Bottom: Hobby-type electronic pH tester.

JOHN CUVELIER

to US; and needless to say, this compound is harmful to fish!

Typically, the amount of residual chlorine in tapwater should be no more than 0.2 parts per million (mg/l), but, as mentioned earlier, a hiccup in the dosing process has been known to result in much greater levels being passed to the consumer, as indeed can disinfection of water mains etc. The use of chloramine (a combination of chlorine and ammonia) appears to be gaining some popularity with certain water undertakings, but the same rules and conditions apply, namely just a common sense approach to the problem. There are numerous 'hobby' test sets available and also some 'professional' models for those wishing to make more accurate measurements.

Tests for pH, ammonia, nitrite, nitrate, chlorine, hardness etc. can all be carried out at reasonable cost by anyone. DO get yourself kitted out. The really keen might wish to get into a routine of daily checks, but as a former water engineer, I think that a weekly test is more than adequate. What you can do, however, is to rely on the 'waterman's' best friends, your nose and taste buds! If, between routine checks, you either smell or taste chlorine in your tap

water, test it! You might be suffering from one of those 'hiccups'! If so, that is NOT the time to practise 'topping up' or water changes! Common sense, yes?

With regard to chloramine, there has been an air of almost panic among Koi-keepers regarding the use of this compound and I really don't know why! The percentage used is still just as minute, and the more quick witted should have realised that the ammonia fraction would be taken care of in the 'nitrification' process within the filter system anyway. So don't lose any sleep over chloramines — they are no more dangerous than any of the other additives in tap water, with the proviso that any process accident during treatment COULD prove hazardous to your Koi.

Hardness

Hardness of water is a constant topic of conversation among Koi-keepers. As there is nothing we can do about it (without spending vast sums of money), you might just as well put up with it. Certainly, your Koi will not come to any harm. I live in a hard water area and the only sign of this fact is the scale in our kettle, and the layer of calcium which forms on the concrete

pool wall and stonework.

Nitrites and Nitrates

Regular and frequent tests for Nitrite ARE advisable, if just to monitor filter efficiency. If the reading rises above 0.01 ppm, you could have problems. Do monitor over a period of three or four days before hitting the panic button, because the ecology of a pool is a fragile beast and can fluctuate wildly thanks to the influence of sunlight, temperature, rainfall, (thanks to acid rain), and sundry other factors.

A growing problem for all of us, is the nitrate syndrome. Our filters produce water rich in the stuff. Our tap water is also full of it, and as for the rain, no comment! The only recourse we have is to let nature pull it out by using plenty of plant life in the pool and watercourses. Failing that, who's for pea-soup?

Summing up

To sum up, you might be forgiven for thinking that perhaps we should call ourselves 'Water Keepers' rather than 'Koi-Keepers'. Well, what's wrong with that? The ecology of our Koi's environment is in our hands, so let's care for it properly.

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QUESTIONS

1. *Amphiprion bicinctus* is the Latin name for which Red Sea fish?
a) Frogfish;
b) Twobar Anemonefish;
c) Twintail Anemonefish.

2. Which FRESHWATER fish is reared in floating cages in the Red Sea?

- a) *Antennarius*;
- b) '*Tilapia*';
- c) *Amphiprion bicinctus*.

3. In relation to most other seas, the salinity of the Red Sea is:

- a) Higher;
- b) About the same;
- c) Lower.

4. The Red Sea lies between which main countries/continents:

- a) Iran-Saudi Arabia;
- b) USSR-Europe
- c) Africa-Saudi Arabia.

***** THE *****

5-MILLION GALLON AQUARIUM

Dr. David Ford of 'Aquarian' visits the Disney World of Florida.
(Photographs by the author)

Yes, 5 million gallons of artificial seawater! Well, 6.2 million gallons to be precise. That's U.S.A. gallons of course; which represents 5 million Imperial gallons, but that's still an awful lot of seasalt mix.

The aquarium was officially opened in January 1986 as the centrepiece of the Living Seas Pavilion at Walt Disney World's EPCOT Centre in Orlando, Florida. Walt Disney World is a theme park

very similar to the Disneyland in California. It is based in Lake Buena Vista some 20 miles from Orlando in central Florida. Note that this is 200 miles from Miami, so any of you lucky enough to afford a U.S.A. holiday should fly to Orlando airport, not Miami airport, if you want to visit Disney World.

Disney World is wonderful for children (and adults who are young at heart) but the new Epcot Centre is a theme park very

much for adults. Opened in 1982, it is a mile from the Disney World complex, via the monorail train from within the park or direct by road ("Motorway" Route 4) from Orlando. Epcot is a two-centre complex with "Future World" and "World Showcase". World Showcase is 10 (more being built) exhibitions of different countries, including the U.K. The British section includes a Rose & Crown Pub (selling Bass and Guinness) and English, Scottish and Welsh shops. The exhibitions are clustered around a lake and it takes at least a full day to walk around that lake and visit each site.

The other centre is Future World where companies such as American Express, A.T. & T, Coca-Cola, Exxon, General Electrics, General Motors, Kodak, Kraft, United Technologies and Sperry Corp., have sponsored a series of creative exhibitions using the very latest technology.

The centrepiece is "Spaceship Earth", the 180-foot high geosphere with its history of human communications. Around this sphere are six exhibitions, Universe of Energy, Horizons, World of Motion, Journey into Imagination, The Land and the Living Seas. Each of these buildings contains very different displays — but all are breathtaking in their use of advanced technology.

The Living Seas is billed as the World's Sixth Ocean and was designed and built by United Technologies as a museum to the relationship of man and the ocean. The following statistics are amazing: the building, shaped like a Nautilus shell, took almost 2 years to erect. It contains 185,000 square feet under one roof, and required 12,000 tons of concrete and 900 tons of steel. The building covers the tank, which is 203 feet in diameter and 27 feet deep. The filter system pumps the artificial seawater through graded silica-sand filters at a rate of 35,000 (U.S.) gallons per minute giving a complete recycle of the 5 million gallons within 3 hours. Visitors view the tank with its sharks, rays, barracuda and hundreds of species of tropical marine fishes from within, through 8 inch thick acrylic windows.

The Living Seas Pavilion can process 2,200 people every hour, with a series of programmes about the sea (Walt Disney long ago discovered that education can be entertainment). These visitors approach the



Above, entrance to "The Living Seas" showing the (artificial) seawater waves crashing over a (concrete) rocky shore.

Below, a complete Pacific coral reef with invertebrates and coral fishes — an aquarium within an aquarium!



building past a replica of the sea shore where a wave of seawater crashes over rocks every few seconds.

At the entrance (as with all Disney exhibits) there is a series of convoluted rails to channel people in orderly lines into the main show area. Artifacts, lithographs and ancient diving gear can be viewed whilst queuing. Groups then enter the 180° film theatre where a 3-minute film tells the audience about United Technologies (this is the commercial break). Then into an even larger theatre where the audience can be seated and a 7-minute film about the oceans is shown. A dramatic film too, tracing the history of the sea from primordial times to recent discoveries of life at great depths.

The audience leave the theatre to crowd into lifts that descend into what is called "Sea Base Alpha". These lifts are called "hydrolators" and streams of bubbles that show through the acrylic windows of the lifts give the impression of descent to great depths. The lift doors open into Sea Base Alpha itself, where a continuous train of two-seater vehicles (called "Sea Cabs") take visitors along a tube inside the 5-million gallon aquarium. It is a 3-minute ride during which you can see 200 varieties of fish, dolphins, sharks and divers, within the huge tank. In fact, 5,000 inhabitants in total.

The "people-mover" ends in the centre of the building where two floors of exhibits allow hours of interesting browsing for the aquarist, especially mariners.

There are six modules with upper and lower floors of exhibits. These include a complete tide pool, a Pacific coral reef with fish and anemones, plus living examples of cultivated shrimps, mussels and food fish. There is a Dolphinarium where visitors and dolphins can look at each other, eyeball to eyeball.

A 24-foot long tank shows how waves are generated and their effects on the ocean floor. A huge acrylic tube, 5-foot in diameter and almost 23-foot high fills with seawater in one minute — with a diver inside who talks to visitors through a radiophone.

Another tall tank is a 24-foot high, 8-foot diameter tube containing 4 huge Kelp, Garibaldi and Moray Eels swim in this "Forest". There are aquaria showing camouflage, symbiosis, bioluminescence, phytoplankton, zooplankton and shoaling species.

Relief maps of the Earth and Oceans are used in static wall displays plus video presentations of the sciences of Geology and Oceanography.

The information that bombards visitors from all sides leaves one feeling bewildered by facts when you leave via another set of "hydrolators". But even then the amazing displays are not over, the exit area has a 264-seater restaurant with a special seafood menu. The diners are tiered so everyone can see into the 5-million gallon tank via 8-foot high windows. These are acrylic panels, each 8 feet by 24 feet and up to 8 inches thick. Each is a single casting of plastic weighing 3 tons, the largest such blocks ever made.

The *Living Seas* employs dozens of staff for directing the flow of visitors, but behind



Trying out my skill in a deep-sea diving suit!



The divers' aquarium where the techniques of undersea survival are shown.



The bottom of the high cylindrical Kelp aquarium.

the scenes are 9 marine mammal handlers and trainers plus a veterinarian with a fully equipped veterinary laboratory. There are 36 technical full-time staff and some are always on hand to answer questions. One such expert revealed a fascinating history of the problems they had when the aquarium was maturing.

It was in October '85 that the aquarium was filled and 1,000 tons of sea salts added. By November '85 it was showing the pH and SG suitable for coral fishes, and the first specimens were installed. Since these were wild-caught specimens any bacterial problem was covered by ozonising the recirculating water. What happened over the next few days was that the 1 part per million Manganese content oxidised to permanganate turning all 5 million gallons a sickly greenish-purple. The experts held a crisis meeting (to do a complete water change would cost over 300,000 dollars) and they decided to increase the ozonisation rather than stop it. It worked. Gradually the permanganate broke down and the water became gin-clear.

Now daily samples are tested for salinity, pH, temperature, dissolved oxygen, ammonia, nitrite, nitrate, phosphate and bacterial load, and corrections made as required. This includes addition of 1 gallon of fresh water every minute to replace evaporation loss.

The control centre is computerised and continuously monitors all the pipework and filters. These sand filter beds hold 10,000 gallons each and 40,000 lbs of sand with 75-horse power pumps to drive them. The pipework is PVC and aluminium held together with stainless steel bolts, often with what is called cathodic protection — a small, continuous electric current to oppose the natural current that would occur where the metal touches the saltwater. This stops any oxidation corrosion.

Any aquarist visiting the *Living Seas* will find the exhibits fascinating, especially if they can talk their way behind the scenes. Epcot — in fact all of Disney World — is fascinating, indeed amazing, to all visitors whether aquarists or not, so it is the ideal family holiday.

Remember, however, that such fantastic entertainment is not cheap. The entrance fee includes both Disney World and Epcot and is 26 dollars each for a full day (usually 9 a.m. to 10 p.m.).

However, it is just impossible to see everything in 1 day, so the 3-day pass is the best value. Instead of 3 x 26 dollars, this is available for 66 dollars — that's around £80 for two, of course, but well-worth it. Furthermore, the passes will be honoured at anytime into the future.

Personally, I love Disney World and Disneyland. I have been there four times and hope to do it all again soon — especially *The Living Seas*. A fly-drive to Orlando is around £350 each, but then living is cheap. Use a budget motel, such as "Econolodge" at only £20 a night (sleeps 4) and eat at McDonald's. Save all the holiday cash for the entrance to Disney World. And "Sea World" is only next door, but that's another story!

"I just can't believe what I'm seeing!" "Fabulous" "Do you paint them every morning?" "Do they need special ponds?" "Oh, aren't they beautiful!" "I've never seen such big fish!" "This is something else!" "How on earth do you keep the water sparkling like that?" "Fantastic!" "Aren't they magnificent!" "Do you sell books about them?" "We keep seeing your advertising but why are you so modest; there just can't be any where else to touch this!" "I almost want to cuddle them!" "Do these babies really grow to that big?" "The prices I see displayed really blow the myth that Kent Koi are expensive. I've never seen better value!" "Do they really hand feed?" "Why don't you advertise the fact that they are indoors! We never go koi-hunting unless its fine." "Fantabulous!" "Do you really sell koi to the Japanese?" "They really are so relaxing that I could stand and watch them for hours." "The kids ask to come here rather than the zoo." "What a mix of colours, there just are n't two the same!" "Far better than all your tranquillisers!" "Was it you we saw on tele?" "No wonder koi keepers get so hooked!" "Absolutely fascinating!" "Why do they come to us like this?" "Out of this world!" "I travel all over to see koi and this has to be the greatest!" "Do you build ponds for koi?" "Why don't you charge people to come in to see them?" "You just want to get in and swim with them, don't you!" "Just wait till I tell Harry!" "Are they real?" "They're really gorgeous. I can understand my koi-keeping friends getting so enthusiastic!" "Good gracious, is that the time: I must go: see you again soon."

Not our words but just a selection of yours!

Thank You!



KENT KOI CO.
POLHILL CENTRE, BADGERS MOUNT, SEVENOAKS. TEL: 0959 33567

Where?

M25, Junction 4 and spur to first roundabout, take first exit to second roundabout then second exit and Polhill Centre is 300 yards on left.



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Helping hand



Nick Lushchan

Setting the record straight

As regular readers of *Helping Hand* know, the trade in general has given me great support since I started this series. I am, of course, delighted whenever I get a positive, constructive reaction.

However, I must not mislead you into thinking that everyone is supportive. Fortunately, those who are negative or, dare I say it (?), insulting, in their reactions, are outnumbered by those who genuinely support my efforts.

Even though the "negative" incidents are isolated, I have recently experienced a few in quick succession. Not only have the comments which I have received been hurtful and insulting, but they have also been INCORRECT.

To take one specific instance: I received a call from someone (who shall remain nameless, of course) a short while ago. He owned several shops and wanted help with the "disabled" side of things. I was, obviously, delighted. Everything went well until I mentioned my expenses. After all, travelling to the north of England from my home in Wiltshire is not cheap. Would he reimburse my travelling expenses, I asked?

What I got in return was a real earful, which amounted to an accusation that I must be "raking it in, and cashing in on the disabled gimmick — getting regular all-expenses-paid days out." I nearly hit the roof! To set the record straight, I'm not "raking it in" — after all, I

was only asking for reimbursement — nothing more! As for "cashing in on the disabled gimmick" — I've never heard anything more ridiculous in my life. I am just (hopefully) helping people out with problems that I have experience of.

Another caller seemed quite keen ... until (again) I mentioned travelling expenses. His reaction was that he was not willing to reimburse me and that I should, in fact, be pleased to be allowed to advise him. He had only made the suggestion because he thought that it "would be something for you (me) to do — you know, something to keep you occupied" ...!

I won't go on with other examples, but in response to another caller: No! The DHSS do not pay for my petrol. I pay for it — just like everyone else.

It's incidents like these that make me want to give it all up. But then I get another supportive 'phone call or letter and everything changes ... thank goodness.

In my opinion, those few insensitive people who fit into the category depicted by the few preceding paragraphs are in dire need of a *Helping Hand* themselves! Let's hope that they are sensible enough to realise how wrong they are in their views. Time will tell ...

The Powerhead Debate

I have had a number of very interesting letters in response to my item on powerheads in the January edition of *Helping Hand*.

For example, Mr. Butts from Avon, would like to inform readers of the dangers to fish when using powerheads. He writes: "The reason for using powerheads is to increase water flowrate. Therefore, the amount of water pumping through a powerhead outlet is very substantial indeed and creates nothing short of a 'whirlpool' in a tank."

Having watched my poor fish swimming constantly to avoid being flattened against the sides of the tank, I have realised how

cruel these things can be. Fish are not designed to be kept in whirlpools! If someone reads this letter, it may well save many fish from death."

Although the letter above sounds quite drastic, there is a very simple answer to it. Firstly, before you purchase a powerhead, read the instructions on the pack. They will tell you the flowrate and the suitability for various aquaria. If, after reading the pack, you are still in doubt, ask the people behind the counter before you buy a powerhead.

Some models cater for spraybars which would eliminate any 'whirlpool' effect, but, once again, read the instructions on the pack.

According to John Allan Aquariums Ltd., the Eheim powerheads which they sell are not suitable for use with the spraybars. The back pressure that these create would drastically cut the life of the power drive unit. John Allan do not therefore recommend this practice. They do, however, give a number of useful hints, apart from the most obvious, (buy

the correct unit in the first place!). For instance, by turning the unit to face the sides of the tank and lowering it deeper into the water, one can reduce the effects of water pressure considerably. Alternatively, if you raise the unit so that it is just out of the water with the outlet blowing across the top of the surface, this reduces the risk of a 'Whirlpool' forming.

If the problem still persists, even after this, one can always change to a larger tank — or buy a less powerful powerhead! (my comment).

Project Pond (Help from Interpet)

The latest bit of news concerning the pond we installed at Burton Hill House School for disabled children comes via Interpet who have kindly donated three books for the children to use.

Thank you Interpet — your gesture is much appreciated — and I've got a letter here from Phil Drake, the Headmaster, to prove it.



JOHN DAWES

Yorkshire has always been different; the scenery, the people, the dialect. You can trace the origins of the true Yorkshireman to the Viking invasions when settlers brought Scandinavian ways and words to an otherwise Anglo-Saxon or Celtic country. To this day the Yorkshire "tribe" — the Tykes, whether from the Moors or the Dales (the Dalesmen), have an openness, bluntness and language unique in the British Isles.

Even the bureaucrats have given Yorkshire a unique geography. Britain's largest county is split into North, South and West, like a lop-sided compass. Local people ignore this and still talk of the "Ridings" — however, these were North, East and West!

The place names reflect their Scandinavian origins: especially the many "sk" ones; a sound the Anglo-Saxons did not have. Examples are Skipton and Skidby, Skelmersdale and Skelton, Skewsby and Skirwith.

Most towns have an aquarium club, some of which have the unusual Yorkshire place names too, from Luddendenfoot to Slaithwaite. Any club night will be filled with Yorkshire yammer. Try "Thamungerrinettun" (a Yorkshire aquarist telling his fish to eat their flakes) or "Woorayevin?" (would you like a drink?).

These differences in outlook and culture are reflected in the fishkeeping hobby itself. There is the British Koi-Keeper Society and the Yorkshire Koi Society, the British Marine Aquarist Association and the West Yorkshire Marine Aquarist Group, the Federation of Northern Aquarium Societies and the Yorkshire Association of Aquarist Societies.

Actually, the Y.A.A.S. is very active, with 45 member societies. Not all are Yorkshire clubs, though. Some are in Scotland and some in Lancashire (the war of the roses is over as far as aquarists are concerned). The attraction for non-Yorkshire clubs is that very openness of the Yorkshire character — the member societies decide on judging methods and standards, not a central committee, and details are published in the Y.A.A.S. monthly newsletter.

There are 10 "A" class judges and 3 "B" class judges, with many trainees. Y.A.A.S. present a rose lapel badge to major award winners. The white rose is for 50 to 100 firsts, a



The Public aquarium at Leed's Roundhay Park. It contains 13 tanks of 20-30 gallons, with marines, cichlids and local species. It was opened in 1981 and is free, being maintained by sponsorship (including local shops and Jimmy Saville). Roundhay has a Cayman Crocodile, a huge Nursing Shark on display, and many large Koi in ponds under the Tropical House walkway.

REGIONAL FOCUS

FISHKEEPING IN YORKSHIRE

Dr David Ford, Head of the 'Aquarian' Laboratories reviews the fishkeeping scene in Yorkshire.

silver rose for 200 firsts and a gold rose for 500 firsts. Tape and slide shows on fishkeeping are rented out and Y.A.A.S. run the annual Yorkshire Aquarist Festival. For years (since 1967) the Y.A.F. has been held at Doncaster Race Course,

but this year the venue was changed to Queen's Hall, Leeds, where it is hoped new visitors will be found to swell the ranks of Yorkshire aquarists.

There are no major public aquaria in Yorkshire — the seaside towns do not have any.

Part of the livebearers breeding section at Belton Fish Farm. (Note the design of the breeding tanks which allows fry to escape the attention of their mothers). Among the more unusual livebearers bred at Belton are Tortoiseshell Mollies, Green and Blue Limias, Black Princess, Catamaco Swords, Ender's Livebearers and Pearlscale Platies.

IMPORTERS & WHOLESALEERS OF FISH AND EQUIPMENT IN YORKSHIRE

Airevalley Aquatics Ltd, Keighley
Belton Fish Farm, Belton
JMC Aquatics Ltd, Sheffield
Keith Barraclough Ltd, Bradford
Ralph C. Hagen (UK) Ltd, Leeds

However, there is a good display in Leeds at Roundhay Park, and the Theme Park, Flamingo



REGIONAL FOCUS

Land, Malton, near Pickering, has a Dolphinarium and small aquarium.

There are many aquarist shops in the area with importers/wholesalers to service them. In addition one Yorkshire wholesaler has started breeding his own stock. This is Belton Fish Farm at Belton, near Doncaster. Over 1600 tanks are kept in a fish house heated via oil-fired steam pipes and the farm specialises in breeding Livebearers, Rainbows and Angels.

One feature of the fishkeeping hobby that is unique to Yorkshire is the number of manufacturers in the county, especially around Leeds. The famous Hockney Clear View aquaria are built at Hockney Engineers, in Leeds. Near Leeds, too, is Tropicure Ltd of Horsforth who make foods and remedies but now mainly deal in pet books, especially aquatic titles. The Hagen range of imported aquatic accessories and foods is also distributed from Leeds.

King British Ltd and Keith Barraclough Ltd are based in an old mill at Bradford. This firm started as a typical Yorkshire pet shop in 1957 and has grown to be a supplier of flake foods, remedies, equipment and accessories for the aquatic trade. They have their own retail aquatic shop in the Hayfield Mills. The Chief Executive, Keith Barraclough, was the first British President of Ornamental Fish International, the world-



THOMAS'S
The Thomas's factory at Batley in West Yorkshire where the 'Aquarian' range is manufactured. . .

MANUFACTURERS IN YORKSHIRE OF EQUIPMENT & FOODS FOR AQUARISTS

Hockney Engineers, Derwent Place, Leeds
Keith Barraclough Ltd, Haycliffe Lane, Bradford
Thomas's (a division of Mars GB Ltd), Oakwell Way, Batley, W. Yorks
Tropicure Products Ltd, Scotland Lane, Horsforth, Leeds
Yorkshire Brine Shrimp Supplies, Unit 19, Cope Mills, Coal Hill Lane, Farsley, Leeds

SOME MAJOR FISHKEEPING CLUBS IN YORKSHIRE WITH ANNUAL OPEN SHOWS

Bradford	Leeds (2)
Doncaster	Wakefield
Halifax	Scarborough
Huddersfield	York
Keighley	Y.K.S.

wide trade organisation for the hobby.

One of Yorkshire's main claims to fame is that the international 'Aquarian' brand is based at Batley (near Leeds, of course!). The huge, new factory of Thomas's was opened only this year. It can be seen dominating the sky line in red and cream, where the M621 leaves the M62. This factory produces a range of pet products, which includes the well-known 'Aquarian' flaked fish foods and remedies. The 'Aquarian' Advisory Service is also based at the factory and handles 5,000 letters a year. Since the 'Aquarian' products from the Yorkshire factory are exported to over 50 countries in seven language labels, the Advisory Service mail comes from all over the world. So, the world's aquarists look to Yorkshire for help and guidance in their hobby. . .

And if that were not enough, Yorkshire also boasts of what is probably the largest intensive culture producer of live Brine Shrimp in Yorkshire. Brine Shrimp Supplies based in Farsley, again(!) part of Leeds.

A new warehouse with about 5000 square feet of floor space and 50,000 litres of culture water can produce around 8 tonne of live Brine Shrimp per month (see **Product Round-up** in this issue for further details).

All in all, Yorkshire is a very special county . . . with very special people.

AQUATIC SHOPS IN YORKSHIRE

The Pet Shop
26 Westgate,
Rotherham

Sliden Tropicals
28 Keighley Rd., Keighley

Viscum Water Gardens
Doncaster Rd., Rotherham

International Aquatic Centre
Westbar, Sheffield

Aqua-Den,
405 Horsbills Lane, Leeds

Wombwell Aquatics
52/54 Park St., Wombwell,
Nr Barnsley

Water Scapes & Mainly Marines
Stephen H. Smith Garden Centre
Pool Rd Gardens, Orley

Mr Armstrong
124 Bede Street, Roker,
Sunderland

Richmond Aquatics
16 Darlington Rd., Richmond

Simons Aquatics
24 Willow Crescent, Clifford,
Nr Wetherby

Atlantic Pet Supplies
4 Zetland St., North Allerton

T & J Tropicals
Great Horton, Nr Barnsley

Animal Magic
Huddersfield

Animal Crackers
Cleckheaton

Pets & Aquaria
Grand Arcade, Leeds

Paws for Thought
Crossgates, Leeds

Star Pets
Sagar St., Castleford

Acomb Pets & Aquatics
The Mews, York

Bentley Aquatics
37 High St., Bentley

Typically Tropical
280 Longsett Rd., Hillsborough

Nautilus Aquatics
Spring Green Nurseries
Postlethorpe Rd., Wakefield

Forster Aquatics
29 George St., Leeds

Deepcar Aquatics
8-10 Manchester Rd., Deepcar

Coral Reef Aquarium
Clock Cinema Bldgs
Roundhay Rd., Leeds

Living World
Ainsley Rd., Leeds

Tomorrow's aquarist

The Self-Help Club

We're getting quite a stockpile of letters to this club! Probably because readers are reassured to find that they're not alone in learning by their mistakes — which is exactly why we started this club. This month, Sharon Turvey of Northamptonshire shares her triumphs and disasters with us:

"How relieved I was to read that I don't have the monopoly on fishkeeping disasters."

I live by a canal and have a pond in my garden, which was set up last year. With such a new pond, I was pleased to see that the fish bred a couple of months after being put in. According to the law preventing anything I do going right(!), a boat allowed too much water into the canal pound, which consequently overflowed into the garden, flooding out the pond. Although the adults survived, they had to be treated, as they'd been in canal water, and all the fry were washed away.

On the tropical side, things weren't much better. I'd ordered some fish from a firm who shall remain nameless. They sent me a Bristlenose minus bristles — who's now turned out to be a lovely Plecostomus — far too many Danios and a Siamese Fighter who looked more like a female than the male I'd ordered.

Then the fish began to die. Almost every day one would be floating on the top. The situation came to a head when my favourite, a *Pomelodus pictus*, died. By now I was fed up with tropical fish and wishing I'd never seen any!

Then, while glancing through an *A & P* article, I realised what was wrong. Every night I switched off my undergravel filter! So it was off for eight hours a day and the tank was stocked to maximum. My poor fish were probably being poisoned, due to my ignorance.

Incidentally, does anyone have trouble with Gouramis fighting? I know of a Dwarf Gourami who killed an Angelfish twice its size and my Dwarves can't stand Angels. I

also can't keep any different sorts of Gouramis together without war breaking out!

And is there anyone out there who can't breed Guppies? It's embarrassing, but true!

On a brighter note, does anyone want Silver Mollies? I have 'plentiful stocks' available... in other words, I'm up to my eyes in them...

What I really want to say is: stick to it. Read and find out as much as possible about fishkeeping in general, as well as different species and their compatibility. Believe me, fishkeeping is well worth the trouble when you see newly-hatched fry or your favourite fish relaxed, content and growing."

We were delighted to receive your letter, Sharon, as there is nothing more valuable in learning about the interest than reading of other people's experiences. Your letter is all the better for the fact that you don't mind admitting to your mistakes — something a lot of us could — and often don't — do! In answer to your questions, yes, we know of many people who have trouble with Gouramis. They look such passive and colourful fish — you never guess what trouble they can sometimes cause! The larger ones, such as Lace, Golden, Blues and Dwarf, seem to be the worst. If you're really keen on these fish — and their colours and shapes do look well in a community tank — why not try the Honey Gouramis? They are bright, good breeders, gentle with their 'spouses', dedicated parents (well, most of the time) and totally lacking in aggression. Your only problem will be finding a pair, but careful investigation of dealers' tanks should help you find an 'enamoured couple'.

As for the Guppies, it is often the case that the fish considered a 'doddle' by most aquarists can prove difficult to others. It can simply be a matter of the water in your area, the siting of the tank, or the particular fish you have. Try siting the breeding tank in a different place — and maybe introducing a few new fish. It is really a matter of trial and error — if you'll forgive us for saying so! If you have

exhausted local shops with Silver Mollies, try contacting your local aquarist society. They will probably be happy to help. In fact, if you are seriously into breeding fish, it wouldn't be a bad idea to join a society, as local fishkeepers should be able to help with your Guppy problem.

As far as your pond fish "overflowing" into the canal — watch out! Introductions of fish (however unintentional) into the wild can cause serious problems among the resident population and must be avoided at all costs.

We will shortly be sending Sharon a copy of Dr Peter Scott's excellent book *An Interpet Guide to Liverbearing Fishes*, published by Salamander and kindly donated by Interpet Ltd. If that doesn't sort out her Guppy problem... nothing will!

Divers reports

Most aquarists would boast at least one community tank, a breeding tank or two — and possibly some fry-raising tanks. But what about the species tanks? How many of you have taken a good look at those fish which need a special aquarium of their own?

With aquarists who have limited space, it is all too easy to stick to the more undemanding fish, feeling that turning over a tank to one species of fish would be a waste of valuable space. But is it? What if you gave the community tank the elbow and set up one or more species tanks? It wouldn't be long before you realised how much you've been missing.

Take, for instance, the Egg-laying Tooth carp (Killifish). These living jewels really cannot be kept in a tank with other species. Most require a dark base in the aquarium, preferably peat-based, lots of bogwood, little plant (and that must be shade-tolerant) and dark sides to the tank. The short lifespan of many species is misleading, as they breed regularly and constant supplies of new fish can be assured. They are the most spectacularly-coloured tropical fish you can find and do not require large aquaria.

Or maybe you might like the idea of an Angelfish tank. They can, of course, be easily kept in the community tank, as they are hardy fish, but their tendency towards nipping the fins of other fish can be distressful and the shops are full of large, discarded Angels. In a tank of their own, however, they can really come into their own.

Discus, Malawi Cichlids and even the Dwarf Cichlids — particularly the Apistogrammas — are all fish best suited to a species tank.

If any of our readers have species tanks, we would like to hear from you. Write to us, giving us a report of your tank, why you set it up, and the rewards it has brought you. We not only like to hear of your experiences, but believe they would generate an interest in the more unusual fish.

Killifish (these are the *Diapteron fulgens* males displaying to each other) are ideal "species tank" candidates.



