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Dear Reader

Following the long, hot summer (well, we can all dream can't we?) the fish road show moves indoors to prepare for winter. However, thanks to modern technology and widely dispensed knowledge, we can continue to keep our indoor aquariums in perpetual summer conditions and tip top order. There can't be many fishes that won't succumb to these ideal conditions and breed for us, given half a chance. Take a look at Terry Waller's continuing series on breeding (and John Edwards on *Corydoras*) and Ann Telford's timely article on how to choose a water purifier with fishkeeping in mind. On a far less technical level Tim Smethurst shows the "technically-disadvantaged" amongst us how to build "do-it-yourself" types of biological filters. Continuing the accessories and hardware theme, Nora Green debates just how much of a bargain those impulse purchases at Big Shows really are.

In this day and age of commercial breeding, often resulting in the fishes bred not knowing their own native waters even if they fell into them, we often forget that once upon a time somebody has to take time and effort to discover the natural species in the first place. Peter Burgess paints the scene from the homeland of the Guppy, Trinidad and Tobago.

Maybe you're considering changing course in your fishkeeping interests? We have one or two thought provoking pieces on doing just that too.

Let us give the impression that fishkeeping is all hard work, there's a timely reminder of all the relaxing and exciting events to look forward to at the Supreme Festival of Fishkeeping at Weston-super-Mare; come and meet all the fishkeepers, manufacturers and Guest Speakers in the fishkeeping event of the year.

We've had our first fan letter to the new FishWord (see Letters) so maybe it's the first step to getting some regular articles from people who may feel there's no reward in doing so. Believe me, there is - I'm the first grateful person, without counting on our thousands of readers. Make my day!

Dick Mills, Editor, FishWorld

Contributions for the next issue should be in hand by October 9th 1995 and sent to: FishWorld Magazine, 10 Rosken Grove, Farnham Royal, Buckinghamshire SL2 3DZ. (Tel/Fax: 01753 645675).

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★ ★ Weston Weekend Competition Answers ★ ★

First the good news. For all those readers who entered the three competitions in the June issue of FishWorld magazine, we can now reveal the answers... Now the bad news.

As FishWorld went to Press before the closing date for entries, it will not be possible to put you all out of your misery by announcing the winners in this particular issue. Winners' names will be announced at the Federation's September General Assembly, published in the *Minutes* and notified by post as soon as possible.

AQUARIAN The questions were:

1. Aquarian Flake Foods contain no dyes whatsoever, but the ingredients do give each recipe a special colour. How many different coloured flakes are there in the Tropical Fish Food?
2. Aquarian is sold in various sized pots, hermetically sealed to maintain the quality of the fresh ingredients used in the recipes. What is the most popular pot size in weight of contents as grams?
3. What fish is depicted on the label of the Aquarian Marine Food in the 25g and 200g pots?

The answers:

1. Six. Yellow - Strength & Growth recipe; Brown - Fresh Fishmeats; Green - Vegetable Diet; Black - a Vitamin & Mineral Flake; Red - Fish & Crustaceae blend, Orange - a natural colour-enhancing recipe using carotenoids.
2. 13 grams in the 25cc pot. This popular size is used for Tropical, Goldfish, Herbivore, Carnivore and Colour Flake Foods.
3. The Powder Blue, *Acanthurus leucosternus*, a popular Surgeonfish from the Indo-Pacific that thrives on the fish protein and vegetable content of the Aquarian Marine Flake.

T.F.H. PUBLICATIONS

The question was:

Which major aquatic event did TFH sponsor for the F.B.A.S. in 1988 and 1989?

The answer:

FISHWORLD '88 and FISHWORLD '89, the two F.B.A.S. -organised fishkeeping Exhibitions held at Alexandra Palace.

Not a trick question, but many thought the answer was the Supreme Championship!

Rolf C. Hagen

The question was:

Hagen's have two types of External Filter.

1) Name the types and 2) How many are there of each type?

The answers:

- 1) AQUACLEAR and FLUVAL
- 2) 5 models of AquaClear, 4 models of Fluval (103, 203, 303 and 403)

Many thanks to all those who participated in these three competitions and, of course, very grateful thanks to Aquarian, TFH and Rolf C. Hagen for making it all possible.

See the lucky winners at Weston!

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From the Chairman:

Dear Friends,

I trust that everyone is having a successful year, be it exhibiting fish or in breeding either tropical or coldwater fishes.

I guess whilst on one hand we have been enjoying the Summer weather it has caused problems for those with ponds and otherwise involved in water-gardening. Many reports have been received regarding Blanketweed and Green Water problems and, not least of all, the explosive population of Duckweed!

On behalf of the Exhibition Committee, I would like to thank all those who came and helped at the Hampton Court Palace Flower Show where we were again a Medal Winner, this year receiving a bronze Medal. Our theme this year was on safety: Our 'Peace of Mind' Garden a raised Pond with an integral seat for the aged; a raised Bog Garden for the disabled and a safe Pebble Fountain for children, built so that it would be impossible for them to fall in and drown.

We are very grateful to Alan Sargent and his son James, together with other staff of 'Town & Country Gardens' for designing and building the garden; to Camas for supplying the bricks and slabs; to Aquatex Ltd., Salisbury, Wiltshire for the fitted pond liners and to Graham Robb, of Chenies Aquatics, who was with us again this year with his AquaCraft Tub features. Graham has since told me that he has already sent one order to ... Australia! Finally, and by no means, least, we thank Alan Benson of Aquavita, for his part on the Stand providing his expert knowledge on filtration.

In closing, I would like to thank our VIP visitors to the Stand, it being especially good to welcome Sheila Esson, who has a great love for gardening; although this type of Show is not really Bob's cup of tea, we thank him for bringing Sheila. I do not like singling out individuals but I must say a special 'Thank You' to our President and his lady, Bill and Joyce Rundle whose knowledge of plants and water-gardening was put to superb use. They were certainly a great asset to the Stand.

I look forward to meeting you all at the Supreme Festival of Fishkeeping.

Peter A. Furze

Peter A. Furze,
Chairman F.B.A.S.

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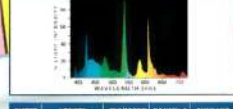
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30	36	89	46	1	34	360	9000
40	42	104	70	1	34	360	20,000
46	48	119	94	1	34	360	20,000

So long Trinidad, and thanks
for all the GUPPIES! by
Dr. Peter Burgess

Fishy tales from the Aquarian expedition to Trinidad
undertaken by Stan McMahon and Peter Burgess
(Plymouth and District Aquarist Society)



Regular readers of FishWorld may recall our earlier article entitled *On the trail of Guppy's guppy* in which we announced our proposed *Aquarian expedition to Trinidad* (see Volume 8, No. 6 pages 36-37). Well, we finally travelled out there in May 1995, had a great time, returned safely with fish, and now we want to tell you a little about our experiences.

TOBAGO

We chose the small and tranquil island of Tobago as our base, which is just a 25 minute air hop away from the hustle and bustle of Trinidad. Here we stayed at a pleasant beach hotel where the warm Caribbean sea lapped its waves onto the shore, just fifty yards in front of our balcony. To our left was the beach bar, a mere twenty yards walk (these two attractions proved a real dilemma for Stan who usually opted for the shorter journey!) We knew that Tobago has a relatively poor freshwater fish fauna, just a handful of species being recorded, but nevertheless it should provide us with our first encounter of wild guppies. We were not to be disappointed. In a small town along Tobago's East coast we came upon a drainage ditch which was absolutely teeming with these livebearers - there were so many guppies breaking the water's surface that the whole ditch looked as if it was being rained upon. It was impossible to sweep a net without landing several specimens. The fish were small but the males stunningly colourful. Within a minute or so we had scooped out a few dozen adults and young (much to the amusement of the locals who were lazing about nearby) and headed back to the hotel with our prize catch. It was the easiest wild fish collection I have ever experienced.

SEARCH FOR RIVULUS

Although our expedition was largely to collect guppies we wanted to observe as many other species as possible.

Tobago was home to one other fish which interested us very much, namely the kill, *Rivulus hartii*. Collecting *hartii* required a little more effort. We had come out in the dry season and most of the rivers were devoid of water, not even small pools remained. Eventually we found a promising spot - a small shallow stream running through dense forest. Unfortunately, every biting fly on the island appeared to be here also, which made life a little uncomfortable despite us both having showered ourselves in repellent. Our efforts were rewarded, for we caught several magnificent adult *Rivulus hartii* which were lurking amongst thick aquatic vegetation near an overhanging bank, and as a bonus, we saw several freshwater gobies darting between the crevices of submerged rocks. We couldn't resist keeping a couple of specimens of each.

ONWARDS TO TRINIDAD

Tobago was a good testing ground for experimenting with various catching techniques but we knew that Trinidad held a much richer fish fauna, including some unusual guppy populations. After a few days recovering from jet-lag, we caught an island-hopper from a small airport near our beach hotel. Within minutes of being airborne we were flying over the mountainous and fertile terrain of northern Trinidad. We were meeting up with zoologists at the Trinidad campus of the University of the West Indies whom we hoped could assist with our collections. It really makes sense to enlist local expertise

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wherever possible, and this was certainly true in our case, for it was largely thanks to Dr. Indar Ramnarine and his two technicians, Raj and Neil, that our trip was so successful. Following a gruelling itinerary, Raj, Neil, Stan and myself drove down highways and dirt tracks in the soaring heat, visiting as many different aquatic habitats as we could manage: large rivers, small streams, pools and tidal mangroves. It was absolutely exhausting but worth every roasting second! Our species list was gradually increasing all the time. From the amber coloured waters of small forest pools we collected several species of characins (including *Hemigrammus*, *Corynopoma* and *Astyanax*) as well as *Corydoras aeneus* catfishes. A few cichlids, either *Aequidens* or *Cichlasoma* (we still aren't sure which), were rescued from a small pool of murky water within a drying river bed, the temperature of which was 39°C and likely soar even higher. And we found more *Rivulus marti*, a species which seemed to be abundant in many habitats. We also located and collected three of the island's four known poeciliid species — *Poecilia reticulata* (guppy), *P. sphenops* (molly), and *P. picta* (black banded livebearer), the latter species netted from a highly saline tidal river (specific gravity = 1.027) which it shared with schools of small silver mullet (possibly juvenile *Mugil curema*) and some fearsome looking crobs! Only *Poecilia vivipara* (the one spot livebearer) eluded us. The guppies were the most important species collected, being the major object of our expedition. We obtained several distinct colour populations from various sites throughout Trinidad, including some very small specimens from a pitch lake (one of only three such sites in the world from which pitch tar is extracted for road construction).

FOLLOWING THE PARSON'S NOSE

Part of our guppy mission had an historical basis. We wanted to visit the St. Ann's River where the "Reverend" Robert John Lechmere Guppy first collected the colourful fish some 130 years earlier (incidentally, he wasn't really a Reverend but 10

called himself one nonetheless). We were very concerned that the river might have become badly polluted since it runs through the heart of Trinidad's expanding capital, Port of Spain. Would guppies still be found there? Parking our hire car close to the river bank, we anxiously made our way down the steep slope, passing tethered goats and burnt heaps of rubbish, until we reached the water's edge. It was a beautiful sight. The St. Ann's River was shallow due to the long seasonal drought, but very clear and bubbling over a bed of sand and pale grey boulders. Apart from some aluminium cans and plastic waste, there was little to suggest that the river had deteriorated significantly since the days of Lechmere Guppy. Around us, however, were sounds and sights would be quite unfamiliar to the Victoria traveller: overhead electric cables, corrugated roofs with TV aerials, and bustling trucks and cars emitting plumes of grey-blue smoke. Crouched down near the water within the tree lined river valley, we were oblivious to our urbanised surrounds. It was guppies we were after and eventually it was guppies that we caught! We never caught males from that site but we did catch two large and healthy looking females along with a glorious pair of *sphenops* mollies.

During our collections, the constant dilemma was in deciding which species to keep and take back with us. Remembering that we had to look after the fish for several days in our Tobago hotel before the homeward flight, we constrained ourselves — better to take just a few dozen specimens rather than hundreds which might provide difficult to manage. It was a decision that paid off in terms of getting the fish safely and healthily back to the U.K.

CONSERVATION PROGRAMMES

As the time came to depart from these dream islands, we realised that we had achieved for more than we could ever have imagined. All the species which we brought back to England are doing fantastically well. We now have dozens of offspring from the various guppy



populations (the populations are housed separately) and these will be distributed to aquarists and Zoos as part of a conservation breeding programme to ensure the future survival of the wild type. As a bonus, our friend Tom Soper (a Plymouth Society member) has obtained eggs from the pair of *Rivulus*, and the *Aequidens/Cichlasoma* which we rescued from the hot pool have repaid us by spawning and hatching fry. The female characins are filling out with eggs and we are patiently waiting for the *Poecilia picta* to drop their first broods — it is only a matter of time.

Forthcoming lectures

Once we have sorted out the pictures of our trip (there are 700 slides to go through!), we shall be offering a few

illustrated lectures (and maybe a little calypso music) to interested Societies. For further information, contact either Pete Burgess anytime on 01973 41871 or Stan McMahon during work hours on 01752 232921.

Acknowledgements

Our special thanks go to **Aquarium** for sponsoring this important conservation-based expedition. Thanks also to Dr. Indar Ramnarine, Raj and Neil of the Zoology Department at the University of the West Indies and to the staff of the Tropikist Hotel in Tobago who suffered in silence as we transformed our hotel room into a mini fish house! We are grateful to the many aquarists and scientists (especially Drs. Ann Magurran and Ben Saghers at Oxford University) who provided invaluable help and advice. © P.J. Burgess 1995

Let's Go with Danios

by Terry Walker



I write this month's article in my fish-house watching my Emperor Tetras spawning again (yes, I know they're not Danios so this isn't a deliberate, or otherwise, mistake!). I never quite get over the buzz you get from breeding and raising your own fish, whether it's Convicts or Tetras: the sense of achievement is wonderful. However, we all have to start somewhere and what place better than Danios, this month's subject matter.

Since the infancy of this hobby (long before 90% of the fish we see and take for granted in our aquariums nowadays were around) the main stays of the aquarium were species from the following selection — Zebra Danios, Pearl Danio, Spotted Danio and sometimes the Giant Danio. Scientifically, the first three are classified in the genus *Brachydanio* and the latter just *Danio*. These have always been very popular fishes for these reasons:

1. They fill the swimming space at the top of the aquarium as they are all naturally top-swimming species.
2. They are hardy, peaceful, no nonsense fishes, ideal for the beginner.
3. They are inexpensive.

Danios and *Brachydanios* inhabit Eastern India and Burma. The fishes are fight-shoaling, gregarious by nature and we should bear this in mind and always keep them in half dozens, minimum. The Danios, as a family, are omnivorous or, in English, will eat almost anything! The fact that they are top-swimmers with upturned mouths gives a good clue to their main food in nature — any insect life (of which there is an abundance in the Tropics) that alights on the water.

To sex them, look at the body shape as there are no obvious colour deviations between males and females.

Let's Go with Danios

(continued)

Females are much stockier with a pronounced roundness in the belly region; males remain very slim with the same contours, dorsally and ventrally, above and below. The Zebra and the Spotted Danio are the easiest to sex but, with practice, all the others can easily be sorted. So let's begin: the fish we are going to breed (note that I don't say attempt to breed; I'm that confident you can do it!) is the Zebra Danio or *Brachydanio rerio*.

All Danios are shoal spawners that scatter eggs all over the aquarium in a vigorous manner; they will also eat the eggs as fast as they can lay them too, so precautions must be taken to minimise egg losses. I always spawn these fish in ratios of 3 males to 5 females (yes I know that doesn't add up to six, but you'll have to splash out a few more pence if you intend to follow my particular recipe for success) in order to get plenty of eggs. First split up the sexes and place in separate aquariums for a week or so whilst feeding them on live foods — mosquito larvae is ideal, *Daphnia* is also good. During this conditioning period, we can set up the spawning tank. We will need:

- an 18" x 10" x 10" tank (or thereabouts)
- a bag of 100 or so glass marbles (raid the grandchildren's toy box — it's cheaper than buying them at today's prices!)
- an airstone (I've taken for granted the tank will be fitted with a heater)

Put about 4 inches of water into the tank (you may have to alter the position of the heater — don't leave it high and dry) and cover the base with the marbles. The marbles make a trap into which the fertilised eggs can fall before the fish can turn round and eat them, the shallow water makes the sinking time short. You'll save about 90% of the eggs this way (I'll detail other ways of minimising egg losses at the end of this article). Add the airstone, put on the top glass and wait.

After a week of well-fed separation, the fishes should be ready. Introduce the females and about an hour or so later add the males. There should now follow a mad chase up and down the aquarium with eggs being expelled, fertilised and falling between the crevices in the marbles. After about twelve hours, you can assume spawning is over so remove the adult fishes. Carefully move a few marbles about or, better still, position the tank so that you can look up from underneath where the eggs should be visible laying on the bottom glass. As soon as I see eggs I remove the marbles and wait for the hatching. Around 48 hours later, close examination reveals tiny splinter-like fry hanging on to the glass sides of the aquarium. Another 24 hours and you can see the fry swimming.

First foods are newly-hatched Brine Shrimp followed by Micro-worm, then mashed up flake food and sifted *Daphnia*. The fry grow at an incredible rate, so fast in fact that you can have the fish an inch long in a matter of 6 or 7 weeks.

The alternative means of saving the eggs from hungry parents include bunches of very dense plants, such as *Elodea*, *Cabomba*, *Myriophyllum* or any similar feathery-leaved plant to act as efficient egg-traps or else artificial spawning mops made from wool could be used. One idea, which has an extra advantage, is to spawn the fish over some netting draped in the water; the eggs fall through the mesh quite easily and you can then catch the adults in one go after spawning is completed.

A shoal of 30 or 50 Danios swimming up and down the aquarium is a very rewarding sight guaranteed to please even the most ardent aquarist, and this is one of the cheapest way of doing it. Flushed with success, you will be keen to expand your stock of fishes by breeding more egglayers, so next month I have chosen the **Gourami** family.



F.B.A.S. PUBLICATIONS

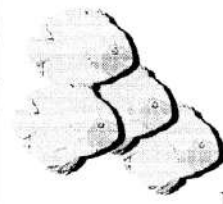
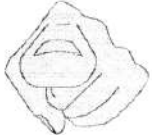
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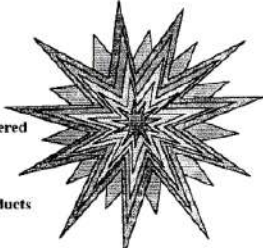
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The GREEN Guide to Big Show "BARGAINS"



Living in the north of England our two bigger Aquatic Shows are in Manchester and Doncaster. The big shows are the places you go to buy your junk ... I mean equipment at bargain prices.

Our first big show was in Manchester, having spent a few weeks reading books on keeping fish, we were ready to set up and had been told it was less expensive to purchase the equipment from the show.

Being new to fish keeping we had to believe everything we were told and were sold some black gravel. The man on the stall said it was a new thing, special price for the show; it would be like gold dust and if we didn't buy it we would never see it again. He was right; we never did see anyone else with it, in fact we couldn't find anyone else who wanted it!

Having set up the tank and put in our first half dozen fish I happen to mention this fantastic gravel we had. Living in a little back water the shop was a bit behind the times because they'd not heard of this gravel. Always ready to help I took a handful to show them; I didn't mind helping out the shop as they had been very helpful to me. They told me to cover the black stuff with some good old fashioned gravel as this was very sharp and would cut the fish's mouths.

By the time our second show came along we knew a lot more, could even name our fish— Mick the Pink Kisser, Percy the Plec. Being illiterate we leave the Latin names alone.

Because we are now almost professional fish keepers, one very nice man on a certain stall says we should be testing the water. We say, but our fish are very happy, he says they are not. He asks where we live? Then tells

us that the water will be ***** and we should add some ***** to combat the problem.

We arrive home, test the water, compare it with the chart and add the stuff. It doesn't work so we add more, then even more, before discovering we are going in the opposite direction to what we thought we should.

The next day we go to our local fish shop for advice. The man in the shop is very nice but a little strange. He hides under the counter every time I open the door.

We tell him our story and he doesn't believe our fish are still alive. It seems our water is soft and we had been treating it as you would for hard water.

To stabilise, he recommends a water change and some Bicarbonate of Soda. The following evening we arrive home from work to find everything, fish, plants, glass had turned white. We did another water change, then another the following day and the fish came through very well!!!!

Another good buy was a filter for my new Discus tank I was about to set up. Being real professionals we knew exactly what we wanted, a nice steady gentle flow.

We arrive at the show, Hubby is full of confidence knowing this time we aren't going to make any mistakes. He chooses the filter we want without asking for help, then just to be on the safe side before we hand over the money we ask if we have the correct one.

Wrong! The one we had chosen would do, but... The man behind the stall recommended a better one and it was cheaper and he would knock even more off the price. A bargain not to

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The Green Guide to Big Show "Bargains" (continued)

be missed! Hubby is pleased that he's managed to save us £2.

However, when we put it into the tank it's like a raging torrent, there's so much turbulence Mark Spitz would have trouble swimming in it. Then hubby has a theory ...

If we add some tube with holes in it should cut down the flow. We buy the tube and I spend Sunday afternoon holding it while hubby drills the holes. I'm still not happy with the flow, hubby says it will have to do. I sulks, so we go out and buy another filter

The Discus arrive the following week, won't settle down so we pass them on to another friend.

He probably won't remember because I was on my very 'bestest' behaviour but it was at that show I was first introduced to Dick Mills.

When you meet someone famous you have to let them know; you know them, well, I mean.

"I've got your books," say I. He smiles, he's expecting to have a intelligent conversation with fish people. To impress him even more I name the little Interpet guides we

have. The one on Fish Breeding, Chris Andrews wrote that; we also have the one on Cichlids, David Sands; I'm beginning to panic. However I did manage to name some. I've even got a personally signed copy of one book. Mind you I did say I wouldn't buy it if he didn't sign it ...

The best buy of all was a four foot tank; we went intending to buy plants, but came back with a tank which meant we had to rebuild the living room. Then we discovered the tank was cracked. Fortunately even though it was some months later when we unpacked it; Tim, that nice man from Hagen's exchanged it for us.

We also bought a beautiful multi coloured rock that is now covered in green algae. But the best 'bargain' of all was a condensation tray that doesn't fit any of our tanks!

I think 'BARGAIN' is a terrible word, I have nightmares about it.

However the shows aren't all bad news; one or two stall holders are more than happy to donate bits and pieces for club raffles; some quite valuable. By the way girls, have you noticed how handsome Tim from Hagen's is?

Trade News

AQUARIAN have recently extended their range of fish foods to include new formats — granules, sticks and pellets. Like their earlier, now world-renowned, flake food range the new foods are the result of much research resulting in foods that are not only nutritious, highly palatable and beneficial to fish but also competitively priced too. Perfect as companion foods alongside Aquarian Flakes, the fishkeepers now have the opportunity of giving their fish a variety of superior nutritional foods. The whole range consists of:

Tropical Granules — outstanding nutrition for all tropical community use — top, middle and bottom swimmers — specially developed to minimise nutrient loss in the water.

Floating Sticks — floating food designed to satisfy the appetite of even the largest tropical fishes such as Oscars and other large Cichlids.

Goldfish Pellets — High protein, highly-digestible floating pellets offering a completely balanced diet for all Goldfish.

Details from: **Aquarian Advisory Service, P.O. Box 67, Elland, West Yorkshire HX5 0SJ**

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F.B.A.S. NEWS

F.B.A.S. WINS ANOTHER MEDAL!

Following on from its success at last year's Hampton Court Palace Flower Show, the F.B.A.S. again took a Medal at this year's event.

The Federation's display was entitled **Peace of Mind** and the emphasis was on safe water gardening. Working in close association with **Town & Country Gardens, Anglo Aquarium Plant Company, Chenies Aquatics and Aquaviva**, the three raised Pebble Fountain, Pond and Bog Garden, with their attendant AquaCraft Water Features brought a **Bronze Medal** response from the R.H.S. Judges. (See elsewhere in this issue for details of the Federation's Garden Show displays).

NEW VIDEO

Colin Panell, the F.B.A.S. Tape/Slide Officer, announced a new addition to the Video Programmes List published in the F.B.A.S. Yearbook.

I have just received a copy of the new video from the range of videos produced by Stan Kemp, of **Kingfisheries** of Beckenham. It will be numbered **V.13** and entitled **THAILAND — DISCUS No. 3**.

This programme is the third in the series of Stan's trips abroad which takes in Thailand as well as experiencing Discus breeding, Thai style. During his visit he calls on a number of Discus breeders in the capital Bangkok and was fortunate enough to film a pair of Discus actually breeding. As with any Kingfisheries' production, the primary emphasis is on fish but Stan also took some time out to visit the Royal Palace in all its ornate splendour and ancient architecture.

This video has been put together with a lot of thought and the balance of subject matter is about right; Stan sees a number of new Discus colour varieties, some of which are in this country now. The quality is very good, considering the conditions under which it was recorded and the programme, which lasts approximately one hour, is well worth considering for your Society's evening entertainment. It will certainly add to your knowledge of Discus — as well as of the fascinating country of Thailand itself.



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F.B.A.S. NEWS

NEW ADDITIONS TO FADS

The following premises have been added to the F.B.A.S. Approved Dealer Scheme (FADS). In order to obtain your discount, please ensure you take your current Membership card when visiting these, or any other retail outlet on the Scheme.

North Lakes Aquatics,
Unit A,
Penrith Industrial Estate
Haweswater Road
Penrith, Cumbria
CA11 9DP
(Tel: 01768 891495)

Fishbank
135 Courtlands Drive
Walford
Herts
WD2 5LL
(Tel: 01923 681118)

Tarke Aquatics
Eggesford Gardens
Eggesford
Chulmleigh, Devon
EX18 7QU
(Tel: 01769 581281)

Please send details of any new dealer willing to join the Scheme to:

F.B.A.S. Advertising Officer, 17 Fernbank Close, Walderslade, Kent ME9 4NH

LOST A FISH?

Not literally, but just information on it, then you can't do better than invest in a copy of the Federation's new **BOOKLET No. 26 — SPECIES REFERENCE DIRECTORY — part 1**. This valuable work will point you to every reference about your chosen fish that has been published in commercially-available fish literature in recent years (TFH, Salamander, Interpet and any other publisher you'd care to name). This first volume (it's obviously an ongoing task) contains hundreds of cross-references for hundreds of species although in fairness it's the easier ones to find that have been included — you can imagine how difficult some of the 'name-changed' cichlids are both to track down and also to back-track through their old names to the relevant literature and pictures!

Obtain a copy of Booklet No. 26, price £1.50 (unbound) or £4.00 with FREE Binder, from the F.B.A.S. Show Stand of Open Shows, or direct from

Merchandising Officer, 14 Upper Dane Road, Margate, Kent CT9 2LX.
Please note when ordering Mail Order to add 25% to cover postage & packing.

*** OPEN SHOW DATES ***

(Championship Class Trophies allocated shown in bold, St = F.B.A.S. Show Stand)

9.9.95	Hounslow A.S.	(J)(St)	1.10.95	Fair City A.S.	
16.9.95	Plymouth A.S.	(Nb-m,B)		Washington A.S.	
17.9.95	Mid-Sussex A.S.	(R)(St)	15.10.95	Salway A.S.	
24.9.95	Cranlington A.S.			West Cornwall F.S.	(W)
	Orley A.S.	(St)	21/22.10.95	Strathclyde Show (Glasgow)	(St)
30.9.95	Bristol TFC	(U)	26/29.10.95	British Aquarists Festival (Bowling, Manchester)	(St)
	Darlington A.S.	(Ca)	31.5.11.95	Supreme Festival of Fishkeeping (Weston-super-Mare)	(St)



F.B.A.S. NEWS

BTC PERSONALITY
Group
BULLSEYE TROPHY CENTRES

ATTENTION ALL SHOW SECRETARIES!!

The F.B.A.S. has a reputation for not only supplying the very best of services for members of the aquatic hobby but also, through its links with the Aquatic trade, excellent Show Support too.

The F.B.A.S. is pleased to announce that an agreement has been reached with BULLSEYE TROPHY CENTRES (the official trophy supplier to the Federation) which will allow very generous discounts for Societies purchasing Show Trophies and Promotional Wear.

On production of details of its current Society membership number (every F.B.A.S. affiliated Society gets one each year), a Society will obtain a 20% discount and FREE ENGRAVING on all trophies ordered. (A 12.5% discount will be available to non-affiliated Societies). Fill in, fax or send the FreePost Card (with September's FishWorld magazine or collect from the Company's Stand at Weston) to enter a FREE DRAW for the chance to win a beautiful Leather Conference Folder, worth over £50, no purchase necessary.

A select range of Trophies and Printed Garments can be seen at the Company's Trade Stand at the forthcoming **Supreme Festival of Fishkeeping**, at Pontin's Sand Bay Holiday Centre, Weston-super-Mare (3rd-5th November 1995). For this Show only, BTC will be carrying over 1,000 trophies on a 'Cash 'n Carry' basis — at 50% discount — so bring your cheque books!! There will also be daily FREE DRAWS for Lead Crystal Presentation Bowls at the Show.

Please send all enquiries, and return postcard to:-
CHRIS FIELD, BULLSEYE TROPHY CENTRE GROUP, 180 SOUTH EALING ROAD, LONDON W5 4RJ (Tel: 0181 568 1405 Fax: 0181 847 5150)

TAKE A CARD!

It may sound like a conjuror's exhortation but in fact it's the latest ploy to make more people aware of the Federation. As has been reported elsewhere, the F.B.A.S. has been attending several 'not-entirely-aquatic' Shows this year and at each one the public is encouraged to ask us to resolve their fishkeeping, and water-gardening problems. Grateful though they may be at the practical (and dare we say 'expert') advice they receive, it is quite likely that once home after the Show, the name F.B.A.S. will soon fail to hold much importance to them.

To act as a gentle reminder, the F.B.A.S. now hands out a small 'business card' on which is stated:

Your aquatic problem has been dealt with by a representative of the Federation of British Aquatic Societies

For details of all Federation services, and location of your nearest aquatic Society, please write to the F.B.A.S. General Secretary

In this way, it is hoped that more, as yet uncommitted, fishkeepers may find their way into their local Society and into the organised world of fishkeeping.

FILTRATION

Part 2

by Tim Smethurst, Hagen Helpline

There are many ways to manufacture your own form of filtration and I shall cover but a few in this article.

The simple box filter can be made from a variety of devices, an old margarine tub being quite popular. Puncture the sides with a great number of holes first and half fill it with gravel, then drill a hole the diameter of a piece of airline in the wide part of a funnel and place upside down on top of the gravel. Puncture some more holes in the margarine tub; top and also drill another airline diameter hole near the side of the top. The difficult part comes in trying to gauge the diameter of the part of the funnel that is level with the top of the tub and once more drilling a hole that size in the centre of the lid. Place the airline through the lid and into the funnel and then place some more gravel around the funnel and fit the lid onto the tub. Connect the other end of the airline to an air pump and there is your filter.

The variation on this basic box filter is endless, my personal favourite being the plastic bottle. Empty a two litre bottle (a beer bottle is my favourite) and puncture a number of holes into it below the half way mark. Fill with gravel to about 1 1/2" above the holes, fit an airstone to an airline and place it in the bottle. Once more connect the airline to the air pump and your filter is ready for use.

Of course, you needn't use gravel, filter wool, sponge, carbon or indeed any filter media you like may be used on its own or as a combination with others.

Undergravel filters are fine on their own, but you might wish to upgrade it for a number of reasons. Your fish may not appreciate the strong immediate current for one reason, high nitrate problems being another. Both can be cured simply and cheaply. Visit your local garden centre

and purchase a plastic seed tray and add plenty of holes in the bottom to the few that are already there. Fill it with gravel and place it above your aquarium. Put in a piece of external filter tubing on the out-put of your powerhead and make sure the other end is in your gravel filled seed tray. The powerhead will then fill the seed tray with water, to be dispersed evenly through the bottom. You now have a biological trickle filter. To help your nitrate problem, an 8 watt pygmy bulb should be fitted above the seed tray and switched on (about 12" is a good height). Leave the light on and eventually a good growth of algae will appear. Once a week or fortnight, harvest the algae and throw it away. The algae will eat away at your nitrates and help keep them at a manageable level.

Perhaps you would like to make your own undergravel filter; this can be done by visiting your local plumbing store. Purchase enough 'T' pieces to join together to cover each width of the aquarium. Then purchase enough tubing (1" is preferable) to connect the 'T' pieces along the length of the aquarium. I cannot give you measurements because I don't know the size of your aquarium! Do not drill holes into it, but using a hacksaw cut it 3/4" of the way down. Make these cuts every 1/2". The reason for cutting and not drilling is because small gravel can get stuck in drill holes but cannot get stuck in slits. Once you have cut your pipework and joined it to all the 'T' pieces, and provided your measurements are correct, you will be able to place it inside your aquarium. Using a drill, a 3/4" length of pipe should be siliconed in place as an up-lift pipe. Making sure all open ends of the pipework are blocked off, cover the pipework with gravel and put your powerhead on the top of the up-lift stem. Your undergravel filter is ready for use.

Filtration Part 2

(continued)

I could probably write from now until my daughter is 16 on different forms of home made filtration (she is only 2 now) but I have given you a few and you can adapt each on to your own needs.

If you own a small pre-formed pond and cannot justify (or afford) to buy a small filter for it, here's how to build a cheap one. Take a polystyrene box, which most aquatic shops will give you for free, and on one side near the top make a hole the size of external filter tubing. On the other side, near the bottom, make a hole the size of some plumbing pipe, again I favour 1" diameter. Silicone the pipework into place, the length depends on how

far the filter is to be placed from the pond. Silicone a length of tubing to the top hole and attach the other end to a powerhead or small pond pump. If using an old powerhead that you have spare, please remember that it is 240v and use commonsense when providing the electricity supply for it. Fill the polystyrene box with sponges, filter wool or whatever media you wish and place the lid back on.

Whilst I agree that it is not exactly aesthetically pleasing, it will work very well and is easy to maintain. If you wish to disguise the polystyrene box, with say a dolls house (or whatever you choose to place over it) so much the better.

Trade News

The next time you go into your local aquatic store in search of a remedy for your coldwater fish, take a look at the new **INTERPET POND DIAGNOSTIC CHART**. Aimed at simplifying diagnosis of pond problems allows customers to cross-reference their specific pond problems with the relevant 'solution to the problem' from Interpet's comprehensive range of treatments. The chart dealer will cleverly position this chart as near as possible to the display stand carrying the entire Interpet range so that self-selection is made easier than ever. Details from: Interpet Ltd., Vincent Lane, Dorking, Surrey RH4 3YX (Tel: 01306 881033 Fax: 01306 885009).

Here's a new concept in biological filtration. Instead of the traditionally undergravel biological bed being oxygenated by passing water through it, what about moving the whole biological bed itself about in the water to achieve not just the same, but immensely better, results? This new concept (known as FLUIDIZED BED technology) is featured in the new SEASTORM-125 from **OCEAN NUTRITION**, via **UNDERWORLD PRODUCTS**; efficiency is said to improve by about 30 times over comparable sized traditional design trickle filters and the filter can respond quickly to any sudden advances in biological loading, such as when new stock is added. Two advantages of the system are that there are obviously no risks of any dead-spots occurring in the bed (all surface area of the filter media is 'active') neither can water channel through paths of least resistance, conditions often found with more traditional systems. Three models (all suitable for both freshwater and saltwater applications) are available — the alternatively named SQUIRT-60 is an in-tank unit for systems up to 60 gallons (U.S. gallons); SQUIRT-30 and SQUIRT-100 models are already planned. The SEASTORM-125 is an external 'hang-on' version whilst the SEASTORM-300 is a professional unit for up to 300 gallons. All models are of low-maintenance design and can be used with existing systems — canister filters, open-sump systems or from any source of pre-filtered water pumped from the aquarium. Details from: UNDERWORLD PRODUCTS, Units 1 & 2, Bolton Road West, Loughborough, Leicestershire LE11 0TR (Tel: 01509 610310 Fax: 01509 610304)

A Weekend DAHN SARF!

from our Northern Correspondent, Tim Smethurst

I had been invited to attend the **Southend, Leigh and District Society's Open Show** on behalf of Rolf C. Hagen (UK) Ltd., on the 29th April. So, on Friday 28th, I packed my Hagen Helpline Stand, all relevant literature and free samples (Fish Foods, Balloons for kids etc) into the Hagen Escort van and headed south down the M1. The original plan was to pay a quick visit to some friends in London and travel on to Southend where hotel accommodation had been booked for me.

An uneventful night would probably have been spent if everything had gone to plan. However, as the saying goes, 'the best laid plans of mice and men ...'

My first part of call was in Brentford, at Joe Nethersell's. Joe is very well known in the hobby and until recently, had been the Chairman of the F.B.A.S. for the past eight years. Arriving the great man's house, I pulled up outside and knocked on the front door. It was immediately thrown open and a volley of abuse was affectionately (??) hurled in my direction. Being a quiet and softly-spoken man myself, I replied in much the same manner. The kettle was put on and coffee and conversation made about the forthcoming Southend Show. Halfway through this pleasant social intercourse, Grace (Joe's wife) came home. As soon as she learned of my plans to stay in a hotel she insisted that I stay the night at the Nethersell household and wouldn't take no for an answer. The hotel room was duly cancelled.

Conversations, which were previously hurried, now became relaxed as we had all evening to



finalise our plans. After eating a rather splendid meal, I knew I had made the right decision in deciding to stay the night. Joe and I retired to the garden to chat idly over fishy matters over a bottle of hospitality which was eagerly accepted and gratefully consumed over the rest of the evening.

The first thing that struck me about Joe's garden was that it was all concrete. Where everyone else mows lawns, he just brushes it clean — clever thinking! Then I saw the pond.



It is of the raised variety about 10ft square and 3'6" deep at its deepest part. A three-module external filter bank was alongside and although only two had media in at the time of my visit the water was perfectly clean, no doubt helped by the sand filter (it itself quite large), obviously no expense had been spared on this pond, nothing being 'too good for Joe's fish.

A Weekend Dahn Sarf!

(continued)

Around 10.30pm we ventured indoors where upon Joe proudly showed me his prized possession — a 12ft aquarium in his study. In it there are Clown Loaches, Rams, Congo Tetras, Neons, Gouramis, Cherry Barbs, Rosy Barbs and plenty more besides including some Brichard swimming quite happily with all the other fish. The aquarium is filtered by two Fluval 403s, has two spot lamps at each end and has a bank of 5 tubes in the middle (one Life-Glo, one Power-Glow and three Flora-Glas). As it is directly opposite Joe's desk (at which I was graciously allowed to sit) it is obviously the inspiration for the hundreds of ideas for the hobby that Joe has dreamt up and developed over the years — no doubt he's already working on the next batch.



The living room boasts an immaculate 4ft aquarium (filtered by a single Fluval 303) full of Anabantoids and is Grace's pride and joy. The fish are in perfect health and are a credit to her, proving that women can look after fish just as well as men. After the tour of aquariums dotted around the house, we retired once more to the study and incoherent ramblings were heard from this room well into the early hours!

The smell of breakfast being

cooked woke me up. I rapidly dressed and headed for the bathroom: whilst I was in the middle of doing what a man has to do, Joe boldly walks in and hands me a morning coffee — has this man no respect for privacy? During the mandatory full English Breakfast, I noticed the walls of the living room had plenty of Nethersell family photographs — children with their University degrees, Joe and Grace at a dinner function and many more. Most people who meet Joe think of him as a loud, sometimes brash, but well-liked man who is always 'on the go'. Very few people see the side of him that is a caring family man.

But back to business. We found the SLADAS Show venue with very few problems. The Southend boys are a nice bunch and greeted me with warmth. After setting up my Stand it was time to 'meet the public' and deal with the questions and problems that people get from time to time; most were interesting and different from the usual run of the mill questions and this made a nice change. Whilst judging was in progress, I was allowed in and shown how each fish is judged. My thanks to Bob Esson for teaching me all he knows about judging fish — in five minutes flat! (Only joking Bob, honest). All too soon it was time to pack up and head for home. Well, not exactly home, but to stay with more friends in Chelmsford (I was born and raised there).

All in all I had a wonderful time and I hope am invited back to Southend next year. I would like to thank SLADA for their hospitality and Club T-shirt (any chance of another, as my wife has stolen it?). Chris Cheswright for inviting me, Audrey for the lovely meal but, most of all, to Joe and Grace for their hospitality and friendship.



Memories of Hampton Court Palace Flower Show 1995



As reported elsewhere, the Federation of British Aquatic Societies' display emphasised water-gardening with safety. The 'Peace of Mind' garden featured separate raised pebble, pond and bog gardens; at strategic points AquaCraft Tub Features were displayed. With the exception of the 240 volt pump supplying the three foaming jets in the Pebble Garden, all the remaining water features and fountains were operated by safe, low voltage, 24 volt pumps.

A couple of distractions occurred away from the display: the new Deputy leader of the Conservative Party, Michael Heseltine, took time out to visit — he is seen at the Tetra Display; Water Gardener magazine Editor, David Papworth, was hanging up his wellies (so to speak) on the Friday of the Show and a suitable presentation was made to him on the Dog World Stand.



The left-hand 'U' shaped wall featured a seat — a handy resting place and for sitting-down maintenance and viewing of the high level pond.

You'd be hard-pressed to drown in this Pebble Garden, but plenty of people washed their hands in the jets without coming to any harm!



No space for a pond? These Tub Features provide colour and water sounds even in the smallest area — and you take them with you when you move!



Michael Heseltine finds the crowd a distraction from the Koi.



— THE ODD COUPLE —
Federation Chairman, Peter Furze and P.R.O., Dick Mills discreetly display their favourite publications at BBC Gardeners' World Live Exhibition at the National Exhibition Centre.

David Papworth, outgoing Editor of Water Gardening, shows off his Presentation Tankard from fellow contributors watched by (left to right) Peter Furze, Chairman F.B.A.S.; Dick Mills, Editor FishWorld; Michael Bolding, Dog World and Barrie Brewster, Tetra.



Choosing a Tap Water Purifier: Handling New Water for Fish & General Water Conditions

by Ann Telford, All Clear Water Purifiers

Recent articles have shown quite clearly that tap water is not suitable for fish. Because of this many fish keepers are now aware that they need a tap water purifier but the question is, which type of purifier do you buy for your fish?

The vast range of purifiers available on the market makes choosing a purifier very complicated. The following guide can be used to identify the decisions you need to make as well as deciding which information supplied by manufacturers is helpful, or unhelpful. Be aware of general water conditions in your area so that you can get a broad feel for the type of water you are sending to your fish. The type of water you have, the type of fish you keep and the type of purifier you choose should be looked at together, rather than looking at each thing in isolation. An overview will lead to making better choices.

1) Find out the needs of your particular type of fish: breeding Discus, community tank fish and invertebrates need different types of water.

2) Get a drinking water report to find out exactly what is in your tap water, what needs changing and what is acceptable. To get a drinking water report, telephone the number shown on your water bill and ask for one! If in doubt as to the meaning of the water report regarding the health of your fish, seek professional advice.

Then start looking at the pros and cons of different types of purifiers available on the market.

Domestic Purifiers: These are totally unsuitable for fish. They can contain either silver, aluminium dioxide, copper and zinc or water softening agents. Their purpose is to improve the taste, odour and colour of water and to

control bacteria levels in drinking water for people. Where a water softening agent is used, this can make the water too soft for fish. Fish are more vulnerable to the effects of dissolved metals in soft water. The softening agent can also lower the pH below the safe levels for fish.

Reverse Osmosis Systems: These can reduce the majority of substances in tap water, dependent on the influent water, the membrane, molecular size of substances etc. R.O. can be useful if you need to reduce some specific substances eg nitrates, but they can make life difficult for the fish keeper. Problems tend to arise because reverse osmosis systems can strip water too clean. Thus amongst other things, alkalinity is stripped and pH balance is lost — pH tends to be difficult to adjust and to maintain at stable levels, inadequate pH buffering can lead to pH rises as well as pH crashes. Essential minerals must be replaced and salinity levels adjusted for the marine keeper etc. Reverse osmosis is more suitable for the confident and experienced fish keeper who is well practised in the art of balancing and maintaining appropriate water conditions and who hasn't got a water meter on their mains supply which measures the amount of water they will be charged for — including discarded R.O. waste water! Reverse osmosis systems come into their own when supplying water to invertebrates.

Nitrate Reducing Resins: For many fish species, nitrates reach fish-kill levels at around 100mg/l; at the lower end of the scale nitrates then act as a skin irritant which can sometimes cause fish to flick and rub. Some scientists see the fish safe level for nitrates at 1.0mg/l but in practice many fish seem to be able to tolerate much higher levels.

Choosing a Tap Water Purifier

(continued)

Generally speaking, fish keepers should be aware of two areas of concern about nitrate reducing resins.

1) When new these resins can show a tendency to be non-selective and to strip all substances from the water; it could possibly be argued that they are likely to react in the same way after they have been refreshed with brine.

2) A resin which can be refreshed so easily necessarily only has a loose hold on the substances it has collected. Again, generally speaking, because the "hold" is so "loose", these resins can show a habit of dumping all the substances they have collected without any warning. It may be more appropriate where fish show that they can adapt to tolerate quite high nitrate levels, not to use these resins, thus avoiding any potential "dumping" problems.

Nitrate Reduction Alternatives: For fresh water tanks, high level planting can be effective as a simpler, and more cost effective, way of reducing nitrates and phosphates. Another method of nitrate reduction is the use of an anaerobic biological filter. These can be very effective if they are set up properly, but it is important to be aware that under certain conditions anaerobic filters can produce humic acids which then lower the pH. For safety, an oxygen barrier should be used between an anaerobic filter and the water return to the aquarium.

Soft and Hard Water Areas: Hard water can be annoying as it can cause deposits of lime-scale on plants and the inside of the tank. It can also cause some fish to show "shimmies" and make it more difficult to keep some "blue" fish without them turning "grey". Some scientists also feel that very hard water can make it more difficult for fish to absorb essential minerals through the gills, although currently this theory appears to be

unproven. However, fish frequently thrive in hard water! Harder water with high alkalinity levels contains less dissolved metals than soft water. As a rule-of-thumb, in hard water only around a third of metals are in dissolved form while in soft water around two thirds of the metals are in dissolved metals. As before, fish can only tolerate low levels of dissolved metals. If high levels of metals are present in a water supply, hard water actually acts as a "protector" to the fish by keeping the majority of the metals in particulate form. Some metal particles, particularly iron, are trapped by pre-filters in hard water areas. Good levels of alkalinity in the water means that the pH is well buffered — something that is missing in softer water areas. Hard water can also affect the choice of a purifier. Carbon block only has tiny holes for the passage of water. This hole size is measured in microns. The majority of blocks sold into the fish world are either 0.5 micron (some of the smaller systems) or 10 micron (larger systems). Both of these blocks have shown a tendency to "block" very rapidly in hard water conditions by general precipitation and calcium carbonate in the water supply. In these water conditions it is reasonable to assume that the carbon blocks will only have a short life before "blocking". The "blocking" of a carbon block should not be seen as a measure of its effective performance in the reduction of other substances found in tap water, like a pre-filter it has simply blocked.

Soft water can be some of the most difficult water for fish and some of the most difficult water to purify. Upper moorland water can have a low alkalinity content, a high pH and high levels of dissolved metals. The dissolved metals levels normally require reduction for fish while the water is so

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Choosing a Tap Water Purifier

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sensitive to change that effective ion-exchange resins are usually unsuitable for use. In water areas which are extremely starved as far as alkalinity is concerned (some water in Scotland and Cornwall), it is advisable for fish keepers to buffer all new water before adding it to tanks (whether it has been passed through a purifier or not) and to use a continual buffering media in the biological recirculation system, eg oyster or cockle shells, pH crashes in aquaria can frequently be traced back to alkalinity levels which are too low. Well-established biological filters can strip the alkalinity from water by their own action and both pH and KH levels should be monitored on a regular basis, particularly in soft water areas. It is important to remember that alkalinity is not a measure of pH, it only acts as a buffer. Low and high pH as well as pH swings can be experienced in water with very low alkalinity levels.

American Testing: The ratings of some purification media are based on NSF American testing protocols, the results of which are not accepted by the UK Water Research Centre (WRC) for automatic recertification. For chlorine reduction, NSF testing is usually based on a minimum 75% reduction performance on a feed water containing 2ppm free chlorine with the water temperature maintained at around 69°F (20°C). On these testing results it is possible to forecast mathematically that purifying media rated on 2ppm Free Chlorine would have a longer performance life when treating water containing a lower free chlorine feed. However, in practice the reduction ability of the media drops each time the water temperature is lowered by around 10°F, the reduction ability drops again as other substances are added to the water supply eg chloramine. Chloramine is found widely

in tap water throughout the UK and the average annual temperature of UK tap water is around 54°F. Thus ratings based on USA testing protocols do not give an accurate picture of the performance of the same purifying media when used on the UK potable water supply. Therefore it is important to check that the ratings you are given for purifiers are based on the whole life time testing of the media on UK tap water, at the normal ambient water temperatures. For fish protection, test results should also be based on the combined presence of chlorine and free chlorine in the water for more accurate reduction performance results.

Carbon Block v Granular Media: Carbon blocks are frequently manufactured from PAC (Powdered Activated Carbon), these blocks are mainly produced to reduce free chlorine, pesticides, VOC's (Volatile Organic Compounds) and, dependent on the micron rating, the entrapment of *Cryptosporidium* and *Giardia* cysts. One American manufacturer states in their own literature that their own "Powdered activated carbon (PAC) briquette is about five times more effective at reducing VOC's than granular activated carbon". No other substances or media are included in this statement, as quoted. Some carbon blocks can be made from granular media. Carbon blocks are supplied mainly for domestic purification and commercial processes where the entrapment of fine particles is needed, eg photographic development. A straight comparison between carbon block and granular media is not possible because there is such a wide range of different granular media which show marked differences in their ability to reduce various substances in water. Generally speaking, activated carbons whether in powder, block or granular form are

Choosing a Tap Water Purifier

(continued)

not manufactured to reduce dissolved metals.

Performance Claims: There is no such thing as zero in chemistry, therefore unless a claim is made that a percentage of a substance is removed, a claim made for performance should be based on the reduction of substances only. Percentage claims can be misleading, they are only valid if you know what was in the influent water to start with, i.e. a 95% reduction of 5 ug/l of a dissolved metal is a very small reduction, whereas a 50% reduction of 50 ug/l of the same substance would actually be a far more effective performance. Some purifying media can be very effective at reducing a substance for a short time but can then quickly tail off in effectiveness, it is therefore important to see whole life time test results, short-term test results do not give an accurate picture. Purifying media acts differently on different water, that is why huge company projects and installations include on-site testing. This is not, of course, feasible with small purifying systems, but water reports matched to proven purifier performance should give an adequate guide for individual ratings. Purifying media can only perform satisfactorily if there is sufficient contact time between the media and the water, exactly the same situation as with biological filters. It is therefore important to know how long the two should be in contact. UK water is cold, this relatively low temperature normally requires a longer contact time, therefore slow movement of water through a purifier will be more effective.

It is difficult to judge between purifier performance with the wide variety of claims on the market. If different claims were made against the same size petrol engine, most people

have enough experience of car engines to understand that a standard car engine is more likely to be capable of running 50 miles on 1 gallon of petrol rather than 50,000 miles. Claims made about the performance of purifiers should be viewed in a similar way.

Vessels: The majority of purifying companies supplying cartridge based purifiers use the same industry standard vessels (it is the cartridges inside which differ). The standard blue vessel is given a ten year life by the manufacturers and this particular group of vessels has been registered with the Water Research Centre to show that they are suitable to be linked to the mains water supply. But vessel registration does not include any effect the vessels may or may not have on the water, nor does it include the effect of the cartridges or their effects on fish. Clear vessels from the same manufacturer are only given a five year life, therefore a mixture of vessels in a purifier do not necessarily have the same life warranty.

BS Ratings: There are two main BS ratings used with water purifiers; (1) BS 5750: This is used to monitor consistency for a product or a service. It does not guarantee the quality of a product or a product's standards of performance. (2) BS 6920: This is for domestic purification of potable water for people. It can be linked to only one part of a purifier and is not linked to the supply of water to fish.

This article only gives a brief outline of some of the factors involved when choosing a purifier for fish, even so it makes it look as if choosing a purifier is like tip-toeing through a minefield!

Choosing a Tap Water Purifier

(continued)

Take These Simple Steps to make 'decision making' easier

Find out the water needs of your fish. Get a drinking water report and if necessary get professional help to decipher it.

Check that you are not looking at a domestic purifier but at a purifier designed for fish.

Ask purifying companies if they have test results you can see.

Check whether the test results are based on UK tap water at normal tap water temperatures.

Check whether the tests are short-term or whole lifetime.

Ask how you can be assured these test results are accurate.

Do not look for an all singing, all dancing, concordia type purifier, there is no such thing!

If you are uncertain what logos, symbols or BS ratings mean — find out from the authorising body.

If thoroughly confused by vastly different claims — think which set of claims is *more likely* to be accurate.

Ask for individual rating to determine what a purifier can do for your particular water supply and your fish.

Are the purifier manufacturers just selling a purifier or are they offering a whole service to you and your fish?

At the end of the day you have to make a decision, but your fish unfortunately, don't have a choice.

Trade News

AL-KO is the name of a new range of high-quality in-pond FOUNTAIN PUMPS. Single 'snap-on' strainer-equipped models PA500S, PA1500S and PA1800S pass volumes of water corresponding to their model number (litres/hour) not allowing for extra 'head' or height of lift required.

Multi-cartridge pre-filter models 1501, 1801 and 3501 take up minimal pond space whilst providing improved clarity and water conditions. Each model comes with 3 metres of HO7 cable (to full outdoor safety specification) and consumes between 3 and 50 watts depending on size. Suited to the smaller, shallower pond (up to 800 gallons and water depths of 2-3 feet), units are guaranteed for one year and are easy to maintain with components being readily available.

The recently-launched Q.ZONATOR has been joined by a 'Big Brother' version for pond use. Because of the high voltage existing in this equipment it should be treated with care and always housed in a completely weatherproof box.

Details from:

**AQUAVITA,
1 Lane End,
Old Uxbridge Road,
Rickmansworth,
Hertfordshire WD3 2XU
(Tel: 0189 582 4556 Fax: 0189 582 3663)**

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TIME FOR A CHANGE?



With the change of the seasons comes a traditional change from outdoor to indoor fishkeeping.

However, once indoors there may be the inclinations to change even further, perhaps more drastically in some ways, by turning from freshwater to marine fishkeeping. (On the other hand, you may be thinking of starting off with marines straightaway, but in either situation this article is still aimed at you).

There are some that believe an apprenticeship in freshwater fishkeeping is absolutely necessary before you try the saltwater scene whereas others say that there is so much to adapt, or even unlearn, that you might as well drive straight in. First we ought to look at a few things, the attractions and the drawbacks.

There is no doubt denying that marine fish are stunningly beautiful generally having dense colours rather than be variations on a silvery theme. Yes, they are more expensive on

average but there's no exact fish-for-fish comparison possible; remember that at present most, if not all, marine fish are wild caught (I stand to be corrected by any mass-producing home marine breeder) and the air-freight charges have to play some part in the cost equation too although the same parameter holds good for freshwater tropics. However, having remarked on the cost per fish, this might well be balanced out by the fact that you won't be buying so many of them (no not because of the cost) because for any given tank size you can't keep quite so many as you could if they were freshwater tropics.

Another area where you might save money is on tank furnishings — there won't be too many plants to buy although the coral could be a once-off expense. What will be a continuing

cost is that of the salt mixes needed to prepare the salt water for partial and regular water changes.

A few years ago, you would have to spend money on an all-glass tank as that old angle-iron framed tank couldn't be used for marines but now that all-glass tanks are the norm rather than the exception things are much different. Aquarium hardware can be common to both freshwater and marine tropical systems — all the fish will need heating, lighting and filtration; marine systems may need extra equipment in the form of a protein skimmer and certainly a Hydrometer (for testing the Specific Gravity of the water) but otherwise much of the equipment is interchangeable. Lighting will need to be more intense especially if invertebrates are to be kept; these animals often harbour beneficial algae within their body cells and these require strong lighting if they are to thrive and be of continuing benefit to their host.

Foods for marines have been as thoroughly researched and produced as for their freshwater counterparts so there should be no problem there as long as you choose your fish species wisely. It's a well-known fact that the more 'exotic' a fish is, the more it's going to cost — fair enough — but with marines there is often a hidden agenda. Many of the truly exotic species — take Butterflyfishes in point — have exceedingly specific feeding regimes, eating only certain items in their natural habitat, things such as sponges which are, for instance, only found in their area and which haven't been replicated or synthesised in any commercially-produced fish food. In these instances, you are likely to be paying large sums of money for the dubious privilege of watching your pride and joy starve to death before your eyes.

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Time for a Change?

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The wise fishkeeper prepares in advance for any new fish before it is bought and there is no substitute for advance knowledge so that losses are minimised and enjoyment maximised. But we ought to continue by thinking of the physical differences between freshwater and marine fishes and how this affects them, and our attitude to them, when in captivity.

The earth is covered by approximately 77% of water and despite only 2% of this being freshwater, the fishes from freshwater sources are, on the whole, extremely resilient and adaptable to anything we insist on giving them in the way of living conditions. Danios from fast-flowing waters seem to get along very well with slow water species such as Gouramis; soft water Characins are often expected to co-habit with hard water livebearers and many hobbyists add a few teaspoons of salt just to give the fish a tonic.

On the other hand, although there are areas of differing amounts of 'saltiness' (enclosed systems such as the Red Sea, with its high evaporation rates, may vary slightly from more open oceanic waters), basically the saltwater areas of the earth's surface represent very stable conditions indeed. The problem with this (although it's fine for the fish) is that in our relatively infinitely tiny aquariums the conditions vary extremely rapidly by comparison and the fish have no tolerance to this whatsoever. This means that a very critical watch has to be kept on water conditions at all times with regular testing and partial water changes being absolutely mandatory. This lack of tolerance also proves difficult in times of disease for the marine fish cannot tolerate copper which forms the base for many freshwater remedies.

It's not just that marine fish look different either, their metabolism is

different too from that of freshwater species. The condition of the medium the fish swims in dictates how it physically works. Reduced to basics, the freshwater fish has body fluids that are 'stronger' and contain more salts and minerals than the surrounding freshwater; due to the phenomenon of osmosis, water is constantly diffusing through the skin of the fish in order to dilute the stronger fluid. As a consequence, the freshwater fish has to excrete as much water as it can to prevent itself from exploding. With marine fish, the opposite set of circumstances occur: the fish's body fluids are weaker than the surrounding salt water and so the fish is constantly losing water through its skin and must literally 'drink like a fish' to maintain the desired balance. Marine fish therefore excrete very little water and their waste fluids emerge as very dense packages in small doses.

Another complication is that many marine fishes are not gregarious like their freshwater counterparts and only one or two of each species can be kept in close proximity to each other; a further obstacle to 'happy families' in the aquarium is that many species seem to object sharing tankspace with anything else that might just happen to be of similar appearance to themselves.

But is it all bad news? Not by a long way; things have become very much more reliable in recent years and the backlog of knowledge built up by the saltwater pioneers has not been wasted. It is obviously prudent to start off with hardy species (they're less expensive too!) and these include Damselfishes and Gobies who, incidentally are good examples of marine species that are being regularly bred in aquariums. Bearing in mind compatibility problems, Butterflyfishes and Angelfishes may be better left until experience has been gained but there

Time for a Change!

(continued)

are many other genera, with less species, that are well worth trying. Don't forget to research every new species through a good book before you buy.

Marine-keeping can be truly satisfying, or downright aggravating; it

Marine Fishkeeping for FREE (well, very nearly)

Should we be blessed with an Indian Summer this autumn, readers within easy reach of the coast should take the opportunity of trying their hand at marine fishkeeping for free.

Collecting native marines at this time of year avoids one of the problems often associated with keeping fishes caught locally — the heat of summer (and this isn't necessarily a reference to the traffic-jammed journey home). Native fishkeeping is an ambient-temperature operation (a salty cold-water aquarium) and things can overheat quite rapidly in the smaller home aquarium, so can things in a shallow rockpool before the incoming tide cools things down again. Should the aquarium temperature get too high then floating a sealed plastic bag of ice cubes in it will help. But before you start there are a few things to plan ahead.

If possible prepare the aquarium with seawater of approximate the same Specific Gravity as that of the local sea (you may have to test this during a previous beach visit); don't be tempted to take home sea water for the aquarium unless you are (a) quite sure it is absolutely clean and unpolluted and (b) live locally enough

all depends on you: whether you are prepared to do the hard work and thus reap the rewards of a new phase of your chosen hobby, or whether you want to remain in your comfortable aquatic rut. It's up to you.



to obtain regular refills: it is better to use synthetic mixes to avoid possible pollution and/or an explosion of bacteria in the small confines of your aquarium. Install aeration and arrange a few flowerpots and rocks on the substrate. A biological filtration system could be usefully installed a few weeks before the collecting trip proper to ensure it is matured ahead of the arrival of the tank's inhabitants.

Consult the tide timetables and aim to arrive at the beach just before low water time to allow for maximum collecting time. Wear shoes (seaweed covered rocks can be very slippery).

KEEP YOUR EYE ON THE TIDE; where beaches are long and very flat the tide can come in much faster than you think.

Many of the rockpool's inhabitants live under or on rocks. Always replace any moved rocks in their original positions once successful capture of fishes has been accomplished — how would you like to come home and find it moved elsewhere? Invertebrates such as Sea-anemones can be collected complete with their rock (it's easier than trying to dislodge them) but do provide a substitute rock in its place for successive tenants to colonise.

ALWAYS LEAVE THE ROCKPOOL AS YOU FOUND IT

Don't be too ambitious in the number of species that you collect. Taking too many home in an overcrowded

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Marine Fishkeeping for FREE

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bucket is asking for a poor success rate. Don't carry rocks and livestock home in the same container — a bumpy journey could cause animals to be crushed by toppling rocks. Crabs (not a wise choice in themselves anyway) should not be carried in the same container as small shrimps or fish — for obvious reasons; carry Sea-anemones separately to avoid stinging other animals. Generally, collecting seaweeds is not practicable; rely on soft growths of natural algae in your aquarium for the benefit of grazing fishes or animals. So how many fish (and what type) should you collect?

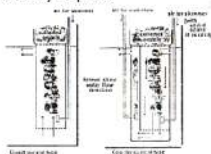
A 24" x 15" x 12" aquarium is probably about the smallest size to use for limited success, a 3ft tank would be better. Only a few small fish should be considered, say a maximum of 6" - 9" in total (the load by invertebrates such as Shrimps and Sea-Anemones on the oxygen consumption has been ignored). The most commonly available

species are Blennies and Shannies although you may find a Fifteen-spined Stickleback among your collection whilst Shrimps are also easy to catch. Look for Sea-anemones, on the surface of rocks; they often close up as you approach and then look like small jelly blots but will soon open out again if you are patient. One species, the Snakelocks Anemone doesn't completely close up. Winkles, Periwinkles and Limpets can also be added to your livestock list.

On arrival back at home, don't forget to equalise the water temperatures before you release the animals into their new home by floating them in a plastic bag for several minutes in the tank.

Food with marine fish food flakes and pieces of shellfish, feeding every other day should be about right but be sure not to overfeed. Don't worry too much if your fishes grow — you can always return them to the wild and collect smaller ones.

tube in which vigorous aeration is applied, this producing the necessary air/water interface. The design further allows the whole column of rising bubbles to overflow at the top of the cylinder into a collecting chamber which is easily removed and periodically emptied.



This basic design works reasonably efficiently and is known as 'direct current' operation, because the aquarium water flows in the same direction as the air bubbles. Unfortunately, the efficiency of protein skimming depends proportionally upon

Protein Skimming & Ozone

Of all the mysteries for the newcomer to marine fishkeeping two of the most often worried about are Protein Skimming and Ozone. These are particularly associated with

marines although, in recent times, the concept of use of Ozone has been introduced into freshwater areas too. Protein Skimming is a method of removing excessive, unwanted protein from the aquarium water. The success of the operation depends on the fact that protein is known as a 'surfactant' — something that collects at any air/water interface. It follows that if an artificial air/water interface could be generated in the aquarium the protein would be attracted to it and from that location convenient collection could be engineered.

In practice, this theory is translated to a submerged, vertical wide-bore

Protein Skimming & Ozone

(continued)

the time that the aquarium water is in contact with the rising air bubble column and, with direct current action, this time is not long.

'Counter-current' design improves the situation by arranging for the aquarium water to enter at the top of the cylinder and exiting at the bottom and actually flowing downwards against the bubbles as they rise thus prolonging the contact time.

Most protein skimmers are air-operated but power-head driven types are becoming more widely available.

Ozone is a particular form of oxygen that has very powerful oxidising capabilities due to its extra atom (three instead of the usual two) which is easily detached to combine with other molecules. Ozone is produced whenever a high-voltage

electric arc is struck (you may smell ozone during a thunderstorm when lightning is near). In the aquarium, passing the air flow from the airpump through an ozoniser results in ozonised air reaching the aquarium. Unfortunately, ozone has several disadvantageous side effects — it rots rubber (diaphragms, airline tubing etc) and can cause nausea if left lingering in the fish-house atmosphere; it must be used with caution and at the recommended rate. In the aquarium it should be used in isolation from the fish and, in marine tanks, this is best done in conjunction with a protein skimmer where the ozonised air bubbles are kept separate in the reactor tube. Incidentally, ozone is an excellent disinfectant and will also enhance the protein skimmers efficiency.

Letters

Dear Sir,
FOUR LANE ENDS AQUARIST SOCIETY (F.L.E.A.S.) would like to say Thank You to all those people who travelled from far and near to attend our 1st Open Show on Sunday 14th May. It was a very successful day, with some magnificent fish on display among the 314 entries; the auction was packed all day with some good bargains in both fish and equipment.

F.L.E.A.S. would like to say a special word of thanks to Bill Rundle, President of the F.E.A.S., and his wife Joyce, for travelling all the way from Plymouth, it must have been a long day for them, even before Bill started the mammoth task of presenting 143 Trophies and Cards.

Best in Show was won by D. Hodgson, Birtley A.S.
F.B.A.S. Championship Class (Db) was won by G & P Robson, Darlington A.S.
Best Exhibitor on the day was J & G Bell, Bishop Auckland A.S.
At the end of a hard, but enjoyable day it was decided by F.L.E.A.S. members that profits from the Show should go to the Children in Need Appeal.
J. Douthwaite, Chairman, F.L.E.A.S.

Dear Sir,
I hope we have not left it too late for you to mention our **Annual Open Show** in the September edition of FishWorld.
The year, **BRISTOL TROPICAL FISH CLUB** is staging their **34th Annual Open Show** at **Shirehampton Community Centre** on Saturday 30th September 1995. Bidding takes place from 9am to 12noon followed by a **Fish Auction at 1pm**, with the main Show open to the public from **3pm** (approximately).
FBAS Trophy Class is Class U (Single-tailed Goldfish)
For further details readers should contact me on 01179 324583 (please note the new dialling code for Bristol 01179).
Many thanks
Tony Hatcher, Secretary Bristol T.F.C.

Dear Sir,
It is with much regret that, at this late stage **EAST LONDON AQUARISTS AND FISHKEEPERS ASSOCIATION** have to announce that they will not be holding their Annual Breeders Show (scheduled for 1995) due to lack of members.
All Trophies held from last year's Show should be returned to Mrs. Hazel Howells (Tel: 0181 590 1824) as soon as possible.
Martin Howells, F.R.C., E.L.A.P.A.

Letters

(continued)

Dear Sir,
On Sunday 24th September 1995, **OTLEY AQUARIST SOCIETY** will be holding its Annual Open Show at Prince Henry's Grammar School, Otley, West Yorkshire. During the day there will be a Raffle, Auction and Judging of 38 Classes of fish.

In the last two years other Society Shows have been noticeably smaller but I hope with your readers' support we can continue our steadily rising attendance seen in previous years.

Simon Midcalf, Show Secretary, O.A.S.
(Tel: 01934 464632)

Dear Sir,
I have just finished reading Nora Green's 'Big Pink Kissers' opus for the third time — now just tell me, how often do readers actually want to read articles three times over? Excellent stuff!

Has she appeared in any previous issues of FishWorld magazine? Are these articles obtainable or will I have to wait for the film? Robert Allan (Subscription no. 567... and waiting for the next instalment!)

Editor's Note: Nora has been writing for FishWorld for several issues. FishWorld is produced to a certain number of copies each issue and by the time we have met subscription orders, sent to every Society in the U.K., plus many abroad, made others available for Open Shows plus Gardeners World Live Exhibition and the Hampton Court Palace Flower Show, there aren't that many left over. I've forwarded your

letter on to Nora (which she'll probably frame — and read many, many times). In the meantime, Nora's column is elsewhere in this issue. Happy reading, Happy reading!

Dear Sir,
The 2nd **ERITH & DISTRICT A.S. OPEN SHOW** (4th June) was a success, considering the previous nine months of ups and downs in the Society's life.
Firstly, was the loss of our Meeting Hall — burned down by vandals.
Then, our Show Secretary left for personal reasons.

And, we were hit by a substantial financial loss.
But, out of the blue, we found a new meeting place and a new venue for the Open Show. After a lot of hard work by Club members old and new, and strong support from sponsors (again old and new), we got the Show on the road and the day proved to be a big success with 330 entries.

We would like to thank all Societies for their help and support without which we could not have managed. Special thanks also to those who travelled a long way to be there — our friends from the Isle of Wight. Thanks to all the Judges for their services and, last but not least, to the girls who managed the canteen and kept the refreshments going all day.
M. Blackie, Chairman E.D.A.S.

Please Don't Feel Left Out

FishWorld magazine is produced for all fishkeepers, both those committed to belonging to their local Society and for those who either choose not to, or are totally unaware of the existence of such a gathering in their locality.

Likewise, any of the merchandising produced by the Federation of British Aquatic Societies, together with any of the Video Programmes on its Programme Aids List can be bought, or hired, as the case may be.



A list of publications can be found elsewhere in this magazine and details of the dozen or so Videos on various aquatic subjects (Setting Up Aquariums, Visits to Breeders in the Far East, Underwater Safaris etc.) can be obtained from:

AQUATALK OFFICER,
9 Edwin Road, Hastings, East Sussex TN35 3JT

SUPREME FESTIVAL of FISHKEEPING 1995

This year's event will be a new experience for all concerned. Despite the long-established exhibition expertise of the Federation of British Aquatic Societies, there is a new anticipation about this year's event which, through the patronage of **Rolf C. Hagen**, promises to excel anything else that has gone before.
In addition to the normally expected fish and aquatic theme, the overall view will also take in appreciations of other pet animals bearing in mind the host Company's involvement over the complete animal care spectrum. To date, the formidable list of attractions looks as follows:-

FISH & AQUATICS

Activities

- FBAS Supreme Championship
- The National Final involving winners of F.B.A.S. 1995 Championship Trophies
- British Masters Open
- An 'open' competition for Fishes, Plants, Furnished Aquaria and Aquascapes Society Competition
- Presentation by Societies depicting typical activities: Ladies', Juniors', Breeding and Handicrafts
- Furnished Aquarium Race
- Completely furnish an aquarium in 20 minutes!

Things to see

- AquaChamp Final
- Watch the 'masterminds' of the hobby perform in the Big Black Chair
- Guest Speakers
- Dr. Chris Andrews (National Aquarium of America), Heiko Bleher, Les Halliday, Dr. David Pool, Deborah Gair
- Specialist Societies
- Informative displays, mini-lectures where appropriate. International Water Lily Association AGM and lecture (Friday pm)
- FBAS Information Centre
- Publications, Advice and Aquatic Society Finder Service
- Trade Exhibits
- See demonstrations of latest equipment; Fish Phone-in; setting up aquariums; Help Line centres; Bookstalls
- Painting Competition
- See how children depict the underwater world
- Trophy Exhibition
- See the glittering Trophies; select yours for next year!



SUPREME FESTIVAL of FISHKEEPING 1995



OTHER ANIMAL ATTRACTIONS

- Bristol Zoo**
—Get close to the animals
- Hamsterdam**
—The complete Hagen Habitrail system
- Mobil Petz**
—Unusual Animals
- Geoff Capes**
—Whether it's Budgerigars or Tug o' War, then Geoff's the Man to seal
- Tricky Tykes**
—The amazing dog display team
- Bluebell Sett Wildlife Appeal**
—See Brock the Badger and other endangered animals
- Foreign Bird League**
—See the flying marvels in their Aviary
- Marine Artist Exhibition**
—Meet Wincey Willis, you can win a special Dolphin painting

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A Look at Corydoras

PART 4

by John Edwards
East Kend A.S.G.



As promised, I am going to concentrate on breeding Corydoras, a straightforward subject you may think — all you need is a pair of fish and they will do the rest. This may be the case with, say, Barbs but Corydoras are a far more complicated an issue.

This may be a good time to describe my breeding set-up (for fish, that is!). I have an 18' x 10' fish house in the garden which I first built 20 years ago; in those days plastic roofs were all the rage as they allowed in plenty of natural daylight which may have a major bearing on my Corydoras breeding experiences which may, in turn, differ considerably from those of hobbyists who keep their fish under more controlled indoor conditions (as far as lighting and heating go).

When breeding fish, sexing is the first hurdle to overcome. With Corydoras this can be hard work at first but with increasing practice it does get easier. When buying, pick the fish yourself, don't just ask for a pair — all you'll get is two fish! Most shops will gladly let you decide — it lets them off the hook.

Pick disease-free fish with good sets of barbels (not worn down); reject hollow-bellied species, especially if they seem sluggish and are not looking for food; such fish may not survive more than a few weeks. Look for large plump fishes, these will be the females whose ventral fins will be more rounded than those of the smaller males. Beware if you are looking for a male amongst poor quality fish, you may pick a dud; breeders must be chosen from healthy stock. In some species males have more prominent features; a much larger dorsal fin,

much more colour (*C. barbatus*).

Having sorted out the sexes, try to buy five fish at a time (3 males to 2 females) although you might find this expensive if you choose species of £25 each! The reason for this is twofold: (1) with only two fish, if one dies during the course of bringing them into breeding condition, it may be impossible to replace it with the right age and size fish to match the remaining one. (2) There are many Corydoras lookalikes: *C. leopardus* (Myers 1933) can be confused with *C. ophiopneustes* (Weitzman & Nijssen 1970), *C. gamezi* (Castro 1986) with *C. trilineatus*. All have a spot in the dorsal fin and a dark band along the lateral line and you could end up with two different species; if you don't keep your wits about you!

So, what to buy? *Corydoras aeneus* (albino) is just the fish for the beginner, probably fish-farm bred and a low price, even when buying five. Pick out fish about 1.5 inches long and try 2 males to 1 female. Since the finnage on *Corydoras aeneus* tends to be rounded on both fish you'll have to sex by body shape.

Place them in a quarantine tank and use this time to bring them up to breeding condition (live foods etc). The female gets even bigger as she fills with roe. You may be lucky and buy them ready for spawning; I had this happen with *C. axelrodi* (Rossel 1962), the change from shop to home water did the trick. If they do spawn immediately, there are two methods of hatching the eggs. You may, since the fish are still in quarantine, elect to let Nature take its course and see how many fry you get. I know this works for I find fry hiding in my tanks quite frequently but not in any great numbers. Alternatively, you could remove the parents but try not to compromise your quarantine regime since there will be a small amount of infertile eggs. An anti-bacteria/fungi agent (acriflavine) should be used to prevent cross-contamination. Of course,

A look at *Corydoras*

(continued)

quarantine period spawning may not happen and the fish can then be transferred to the main aquarium and allowed to settle in.

At *Corydoras* reach spawning condition, colours intensify or change completely; male will chase female swimming just behind her dorsal fin. Both will inspect sites for spawning appearing to clean them; don't confuse this action with looking for spare food on the leaves of plants. Pay particular attention to the female's ventral fins as it's here she carries eggs in a 'basket' formed by these fins, the number of eggs varying between species (our *aeneus* carries about 10). She will deposit the eggs around the tank, on the glass and plants, in the case of *aeneus* singly whereas *barbatus* deposits groups of up to 25, laid 2" down from the surface and never on plants. *Corydoras elegans* will lay strings of eggs up to 20 in length, 500 eggs in total, much the same number as *aeneus*. Many observers of *Corydoras* spawnings remark about the 'T' position taken up by the two fish; I have also seen this

action but remain unconvinced that this is where the male releases his sperm to fertilise the eggs. In *Corydoras barbatus* I have seen the male pass over the eggs much in the same manner as spawning cichlids.

Before I get into trouble with other *Corydoras* breeders, let's pass on to egg-collection. These can be gathered between finger and thumb using a rolling action; eggs feel hard and slightly sticky; it's best to let spawning finish and the eggs harden off for about an hour, before collection otherwise the eggs can be damaged. If you find the eggs stick to your fingers, spin the egg off again using finger and thumb; don't worry about infertile eggs (these have a small white spot on them) they will break apart and you won't their already forming fungus to contaminate your good eggs.

This is by no means the end of the breeding story but the Editor has called 'time', so you will have to wait until next issue for advice on fry-raising.

Trade News

FLORASTICKS (a gravel additive to create fast plant growth), **FLORAFABS** (containing iron and essential elements to encourage healthy root formation) and **FLORAPRIDE** (another iron-rich fertiliser supply plants with strengthening nutrients and luxurious green colouration by the formation of chlorophyll) are three new products in the **AQUAPLANT** range from **TETRA**. Each supplements the other, without encouraging unnecessary algal growth. Look out for the Tetra AquaPlant display at your local aquatic store.

Details from: **TETRA INFORMATION CENTRE, Lambert Court, Chestnut Avenue, Eastleigh, Hampshire SO5 3ZQ** (Tel: 01703 620500, 24 hour Helpline on 01703 648339)

Psiche Palaces is the name of new **AQUARIUM ORNAMENTS** from **ROLF C. HAGEN**. See your fish swim through fishy fortresses, wiles, turns and caves; even a fish forum; the large openings make them safe for fish to pass through, especially the **Lower Bridge** (advertised elsewhere as London Bridge) that shines in antique 'gold'. Made from non-toxic polyester resin, they are quite safe for fish, durable and colour-fast in water. Set these ornaments off in front of the new **MARINA AQUA-DECOR BACKGROUNDS**. The three three-dimensional scenes, each 19" high, show a Rock Scene, a Tree Slump and an Underwater Greek Ruin. All add extra front-to-back depth to any aquarium or terrarium and are easily cut to the convenient size by virtue of being calibrated every 4".

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And You Think YOU Have TROUBLE!

Some years ago, the answer to some of Scotland's employment problems, especially around the west coast, seemed to lay in fish-farming particularly in such lucrative species as Salmon. Many communities have flourished thanks to the salmon as the nearness of work has stopped the exodus of the workforce to the larger cities.

In theory all that was needed was some pens located in freshwater in which to house the young before they were transferred to pens in the sea to mature to adulthood before their sale to supermarkets as food. However in the twenty years since the idea was first put into operation, things have not always run as smoothly as might have been anticipated.

One big problem in raising fish in huge commercial quantities (we're talking maybe a million or two fish of each fry raising establishment for example) and in close proximity to each other too, is that of disease which could soon wipe out stocks, and profits, almost in a month or two. Oddly enough, one of the main disease threats comes from the very wild species of salmon that the fish farming is seeking to replace or protect; *Furunculosis* is brought into the fresh head waters of rivers by returning wild salmon which infects the waters that lead into the hatcheries and raising pens. Antibiotics are just about coping with the job as they are in dealing with another problem — Fish Lice.

These parasites infect the fish mainly in the loch waters that receive salt water through tidal action, in addition to antibiotics, a more natural combatant is also being used; the Goldsinny Wrasse, *Ctenolabrus rupestris*, is a known predator of the fish louse and around one Wrasse to eighty salmon is the 'dosage' that is found to be effective — until the Wrasse also become infected with some other disease along with the Salmon.

The fish lice have also had a knock-on effect on to other areas of Scottish income — game fishing. Due to the infestations of fish lice around the salmon

pens, wild Sea-trout are also becoming infected with severe losses of fish in the nearby erstwhile luxury game fishing waters; the famous Delfin fishing Hotel has been feeling the full force of adverse conditions for some time now, and this 'industry' is openly campaigning against future development of further salmon fish farming in the area. Conservationists are also concerned with the levels of remnants from the amounts of antibiotics being used, especially in the freshwater lochs areas that lead to the sea and which receive no beneficial tidal cleaning.

Latest moves to ensure plentiful, but healthy, stocks of salmon for the table have been to move some of the sea pens some five miles out to sea where the fish can be raised to maturity in cleaner conditions, although being in the open sea these pens are far more likely to be damaged by storms and rough weather than their counterpart in the sheltered sea-loch waters.

Incidentally, the farmed fish are raised on pelleted foods prepared from less profitable sea-caught fish; they are fed for ground 50% of the time automatically from dustbin-like hoppers but for the rest of the time hand-feeding is employed so that the feeding habits can be studied (all corresponding to weather, water temperatures etc) bearing in mind that overfeeding on this scale works out very expensive!

Although automation has been brought in to many aspects of fish-farming (fish can be machine-sorted for size before distribution to raising pens), it is felt by some that the delicateness of some of the areas of operation just isn't suited to overall mechanisation. When the female salmon have been handstripped of eggs and these have been fertilised by mixing with male milt, there is a long process of checking to be done to sort out the infertile eggs (often fungussing and likely to affect the rest); this is done by hand — quite a chore when you're dealing with five million or so eggs!

What with falling stocks, higher antibiotic bills, and all other kinds of efforts needed to keep things going in response to supermarket demands for high-quality, low cost fish, you can now see why the Scottish fish-farmer has a few headaches on his mind just now.

Even experienced FISHKEEPERS have problems



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MAGAZINE

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by Dr. David Ford
 Senior Consultant

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I would be interested in any information you have on keeping Seahorses, whether they are easy to keep, what other species can they be kept with, breeding, rough price guide and conditions of water etc.

C.F., Maidenhead, Berks.

Seahorses eat tiny live food - this has to be reproduced in the aquarium - you need to hand-feed frozen shrimp or arrange a constant supply of live Brine Shrimp. Seahorse will not eat commercial diets. They only live a year or so and may be often nearing that age when bought.

There is a Seahorse Society in the U.K., and I advise getting practical advice from existing seahorse keepers even before setting up a tank. The address is: The Seahorse Study Group, 14 Knaves Hill, Linslade, Leighton Buzzard, Bedfordshire LU7 7UD. There is also the Seahorse Nature Aquarium, Unit 3, Kings Wharf, The Quay, Exeter, Devon EX2 4AN (Tel: 01392 438538).

I have a 2ft and a 3ft tank already set up but, what I'm now looking for to build my own tanks, to whatever size I desire. I searched my local library and bookshops for relevant information but to no avail. Could you help?

K.M., Bude, Cornwall

As tank sizes increase so too does the weight of water and its pressure on the glass. The recommended glass thickness for large tanks is 15mm although in fact many manufacturers use only 10mm relying on top cross-straps for strength. Whilst secondhand, or reclaimed glass may be cheaper, new 10mm glass may well be stronger than old 15mm because glass becomes more brittle with age.

Assemble all-glass tanks with a light smear of Silicone Sealant; make sure edges of glass are clean wipe with

Methylated Spirits. Always use aquarium-suitable sealant (not D-I-Y Superstore bathroom/kitchen sealants) and hold together with sticky tape for a day. Then make watertight by running a continuous bead of sealant along all internal joints, smoothing off with a wet thumb. A blob of sealant on cross-straps is sufficient, including a glass runner for the cover-glass. Leave for another day.

Alternatively, a three-sided marine ply box can be waterproofed with ordinary clear polyurethane varnish (not yacht varnish) with a 10mm or 12mm thick front glass panel silicone sealed into place.

Stands must be adequate too. A metal stand (angle-iron) is best but protect the floor from the small (and often sharp) feet. Floorboards can be 'bouncy' - use a cross piece to fix the stand to the wall.

Height is important - manufacturers make low stands for safety reasons (a tank is generally top-heavy) but hobbyists prefer to view the fish standing up, so a 30" or 36" stand is preferred another reason for fixing to the wall.

If you make your own top you can fix the fluorescent light starter gear anywhere - a picture hook on the wall behind the tank is ideal. If you use spotlights, hang them about 12" above the water, protect the lamp from splashes by a cover glass.

For more ideas, get the following books from your library:

Making Your Own Aquarium by Jorgen Hansen (Beli & Hyman 1979 ISBN No. 0 7135 1929 0)

The Living Aquarium by Peter Hunnann et al (Ward Lock 1981 ISBN No 0 7063 6127 X)

A Weekend DAHN SARF!

from our Northern Correspondent, Tim Smethurst

I had been invited to attend the **Southend, Leigh and District Society's Open Show** on behalf of Rolf C. Hagen (UK) Ltd., on the 29th April. So, on Friday 28th, I packed my Hagen Helpline Stand, all relevant literature and free samples (Fish Foods, Bellons for kids etc) into the Hagen Escort van and headed south down the M1. The original plan was to pay a quick visit to some friends in London and travel on to Southend where hotel accommodation had been booked for me.

An uneventful night would probably have been spent if everything had gone to plan. However, as the saying goes, 'the best laid plans of mice and men...'

My first port of call was in Brentford, at Joe Nethersell's. Joe is very well known in the hobby and, until recently, had been the Chairman of the F.B.A.S. for the past eight years. Arriving at the great man's house, I pulled up outside and knocked on the front door. It was immediately thrown open and a volley of abuse was affectionately (?) hurled in my direction. Being a quiet and softly-spoken man myself, I replied in much the same manner. The kettle was put on and coffee and conversation made about the forthcoming Southend Show. Halfway through this pleasant social intercourse, Grace (Joe's wife) came home. As soon as she learned of my plans to stay in a hotel she insisted that I stay the night at the Nethersell household and wouldn't take no for an answer. The hotel room was duly cancelled.

Conversations, which were previously hurried, now became relaxed as we had all evening to



finalise our plans. After eating a rather splendid meal, I knew I had made the right decision in deciding to stay the night. Joe and I retired to the garden to chat idly over fishy matters over a bottle of hospitality which was eagerly accepted and gratefully consumed over the rest of the evening.

The first thing that struck me about Joe's garden was that it was all concrete. Where everyone else mows lawns, he just brushes it clean - clever thinking! Then I saw the pond.



It is of the raised variety about 10ft square and 3'6" deep at its deepest part. A three-module external filter bank was alongside and although only two had media in at the time of my visit the water was perfectly clean, no doubt helped by the sand filter (it itself quite large), obviously no expense had been spared on this pond, nothing but too good for Joe's fish.

A Weekend Dahn Sarf!

(continued)

Around 10.30pm we ventured indoors where upon Joe proudly showed me his prized possession - a 12ft aquarium in his study. In it there are Clown Loaches, Rams, Congo Tetras, Neons, Gauramis, Cherry Barbs, Rosy Barbs and plenty more besides including some Brichard swimming quite happily with all the other fish. The aquarium is filtered by two Fluval 403s, has two spot lamps at each end and has a bank of 5 tubes in the middle (one Life-Glo, one Power-Glow and three Flora-Glos). As it is directly opposite Joe's desk (at which I was graciously allowed to sit) it is obviously the inspiration for the hundreds of ideas for the hobby that Joe has dreamed up and developed over the years - no doubt he's already working on the next batch.



The living room boasts an immaculate 4ft aquarium (filtered by a single Fluval 303) full of Anabantoids and is Grace's pride and joy. The fish are in perfect health and are a credit to her, proving that women can look after fish just as well as men. After the tour of aquariums dotted around the house, we retired once more to the study and incoherent ramblings were heard from this room well into the early hours!

The smell of breakfast being

cooked woke me up. I rapidly dressed and headed for the bathroom: whilst I was in the middle of doing what a man has to do, Joe boldly walks in and hands me a morning coffee - has this man no respect for privacy? During the mandatory full English breakfast, I noticed the walls of the living room had plenty of Nethersell family photographs - children with their University degrees. Joe and Grace at a dinner function and many more. Most people who meet Joe think of him as a loud, sometimes brash, but well-liked man who is always 'on the go'. Very few people see the side of him that is a caring family man.

But back to business. We found the SLADAS Show venue with very few problems. The Southend boys are a nice bunch and greeted me with warmth. After setting up my Stand it was time to 'meet the public' and deal with the questions and problems that people get from time to time; most were interesting and different from the usual run of the mill questions and this made a nice change. Whilst judging was in progress, I was allowed in and shown how each fish is judged. My thanks to Bob Esson for teaching me all he knows about judging fish - in five minutes flat! (Only joking Bob, honest). All too soon it was time to pack up and head for home. Well, not exactly home, but to stay with more friends in Chelmsford (I was born and raised there).

All in all I had a wonderful time and I hope am invited back to Southend next year. I would like to thank SLADA for their hospitality and Club T-shirt (any chance of another, as my wife has stolen it?). Chris Cheswright for inviting me, Audrey for the lovely meal but, most of all, to Joe and Grace for their hospitality and friendship.

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