MARCH 1990

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COVER STORY

(Photograph: Max Gibbs — The Goldfish Bowl, Oxford)

This spectacular hardy fish is known by a variety of common names and two scientific names (depending on which book you read). On the popular front, it is known as the Fuzzy Dwarf Lionfish or Short-finned Lionfish, or, in a more 'general' vein, as simply Scorpionfish, Butterflyfish or Turkeyfish. Scientifically, most books refer to it as *Dendrochirus brachypterus*, but some of the more recent publications now use the name *Brachirus brachypterus*.

Whichever way you look at it — or whatever you call it — this dramatic-looking fish, which is found from the Indo-Pacific to South Africa, can grow to around 17cm (c. 6.7in) in the wild but, tends to remain smaller, i.e. at around 10cm (4in) in captivity.

EURO KOI THREAT

As one cloud disappears over the horizon, another equally threatening one often takes its place.

For Koi-keepers, importers and traders, the SVC cloud of the recent past seems, happily, to have dispersed, leaving us all a little wiser . . . perhaps. There is now a new cloud waiting to cast its shadow over the hobby — one that could, if it were to materialise to its full potential, have equally drastic, or even more damaging, effects.

It concerns EEC legislation which is currently being prepared and which could — should it go through in its presently proposed form — effectively put a stop to the importation of Koi and other fancy coldwater fishes into the UK.

Up to now, the only parties involved in the discussions have been the Ministry of Agriculture Fisheries and Food (MAFF), the Council for European Communities (CEC) and 'interested, representative UK organisations'. The trouble with this, until quite recently, is that the only 'interested' organisation involved was that representing the UK Food Fish producers.

It is, of course, only right and proper that they should form an integral and important part in negotiations. But, let's face it, *their* priorities and *ours*, as aquarists, pondkeepers and importers, breeders (or whatever) of ornamental fish, couldn't be more different.

The proposed regulations could result in the prohibition of movement of fish from one 'zone' (defined on the levels of identified diseases) to another of a different designation.

In addition, very strict health criteria would be imposed on holders of stocks, involving significant investment and strict testing over a two-year 'qualification' programme.

The movement restrictions could probably be relatively easily met by the food industry (since food fish often need to be moved only once — to market). When it comes to ornamentals, of course, the story is quite different, and the movement criterion could pose virtually impossible barriers for many members of the aquatic industry. As a result, if the legislation goes through in its present form, importers of Koi and other coldwater fish would face very serious threats indeed.

Fortunately, this ominous cloud has recently shown signs of 'lightening', with MAFF inviting representation from the ornamental fish industry.

Over past months, we've been carrying items on a new organisation, **Ornamental Fish Industry (UK)** — see the November '89 editorial and news item in our February issue. This organisation is our lifeline. It is made up of highly dedicated, well-informed people who will fight tooth and nail (or should it be, scale and fin?) for the survival of our hobby.

Let's give them all the support we can. Contact them, join them, fight with them — they need our support . . . and, boy, do we need theirs!

John Dawes
Editor

IMPORTANT DATE FOR YOUR DIARY

THE SANDOWN FISHKEEPING EXHIBITION IS ON 23 & 24 JUNE

FOR FURTHER DETAILS RING: 0256 29998

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Tomorrow's Aquarist

By David Sands

We are now firmly drawn into 1990. *Your* column has attracted plenty of interest. Already, the editor is working furiously to improve other columns to match up to our special standards!

Disillusioned fishkeeper

In January's **Tomorrow's Aquarist** I asked if any of you out there fancied a job in fish research or the aquatic industry. I recieved a eye-opening letter from a rather disillusioned fishkeeper in Southampton, **Philip Asworth.** While studying for his 'A' levels he already kept coldwater fishes and even worked in a local aquatic shop to earn pocket money. Eventually, he went to earn a degree and even began keeping Central American Cichlids. He left college with a First Class Honours degree in chemistry and fancied researching into aquatic cures and general chemical treatments. He came up against a brick wall after contacting some of the major companies in the aquatic industry.

That doesn't surprise me at all. Research and development is very expensive, and most of the cures and remedies have been on the market for years, but it is sad that Philip's hopes and aspirations had been dashed so quickly (some companies didn't even reply to his letters . . .).

One company explained that no research was carried out, but only quality control of a very old set of cures . . . How sad. Philip has written about something I am only too aware of.

He also explained that his financée doesn't always understand his fishy life. How many of you have trouble of this kind with your girlfriend, or how many girl fishkeepers have trouble with their boy friends?

In truth, there might be five million fishkeepers in the UK, but the business is not big enough generally to warrant a realistic unit developing new and improved products. Most of these come from the USA and the Far East markets.

Another problem is that many really effective treatments would have to be prescribed (unlike in the USA) by a vet, and so, companies often have to rely on the old dye treatments . . .

It's a shame, but thanks for your letter, Philip. I'm sure it will not put off some bright fishkeepers who want a job in the aquatic industry.

A **Tomorrow's Aquarist** bobbed his head around the door of my shop and asked for a weekend job. He proved to be very keen and slightly dyslexic which meant that I had to slow him down on a few occasions.

Have you ever tried to get a weekend job in a tropical fish shop? Do you already work in a tropical fish shop?

Tomorrow's Herpetologists(?)

Dr Gareth Evans, a biology teacher, who was already on my files (in the mimicry section) — because we had corresponded several years ago over that absorbing topic 'why do fish share the same colour pattern?' (Gareth was looking at snakes and I was looking at . . . catfish.), has written to me again.

Gareth takes *Aquarist & Pondkeeper* into school each month (some classes might not know how lucky they are!) and, presumably, discusses items with the class. He likes the idea of **Tomorrow's Aquarist** as much as you, me and John Dawes (the editor), does, EXCEPT he wants to write/involve our column in herpetology.

That is not the science of 'HER PET', but reptiles and such-like. The nearest I came to the fantastic subject was when I kept some Common Tree Frogs in a special florarium (a tank with a glass upper in which plants can be installed).

I loved these frogs. I used to order my crickets from Midland Pet and Reptiles, through the post. One morning a parcel came and I was passed it while I was still in bed. It had been very cold . . . I therefore thought the crickets might have died, so I placed the sealed package onto a radiator to warm up. Then I realised the crickets had become too hot so I panicked and opened up the package to let in air. The two tubs were side by side BUT upside down. I opened up the package and the top flew off, spilling a potful of crickets down my pyjama top as I lay in bed!!!

You might gather why I now write about catfishes and not reptiles . . .!

DAVID SANDS

I loved my free frogs — even though they were responsible for giving me a pyjama-ful of crickets!

Gareth's letter makes me wonder if other schools have an interest in keeping reptiles and amphibians and if we can't organise a project with his school. How about photographing the class at work? How about other **Tomorrow's Aquarists** or herpetologists?

T.A's Top Ten

I want to work out the Top Ten most popular fish with **Tomorrow's Aquarists** and would appreciate you sending me a score sheet from the following tropical freshwater, tropical marine and coldwater fish:

Tropical Freshwater Species

Guppy
Platy
Swordtail
Molly
Dwarf Gourami
Other Gourami
Siamese Fighter
Neon Tetra
Cardinal Tetra
Glowlight Tetra
Other Tetra
Harlequin
Bristlenose (Suckermouth Catfish (*Ancistrus* or *Hypostomus*)
Corydoras (state which species 'cause I'm biased!)
Other Catfish
Angelfish
Ram
Discus
Other Cichlid
Zebra
Clown Loach
Kuhli (Coolie) Loach
Sucking Loach
Other Loach
'Oddball' fish

Coldwater Species

Common Goldfish
Shubunkin
Fantail
Other Fancy Goldfish
Bitterling
Orfe
Koi
Other coldwater fish

Marine Species

Clownfish
Dominoes
Damsels
Lionfish
Grouper (state species)
Cleaner Wrasse
Other Wrasse
Marine Angel (state species)
Marine Butterfly (state species)
Tang (state species)

The list closest to the average Top Ten will receive a prize and also the one that matches the known Top Ten based on Neil Hardy, Aquatic Fish Importers and Tropical Marine Fish Importers, London (I'll ask them). In case of a tie, the owner will be the first 'correct' entry drawn from the hat.

You're not to cheat and pick the ones you think will be numbered 1-10. They HAVE to be your favourites!

ELECTRICAL SAFETY AND THE AQUARIST

The safety standards of British-made electrical aquarium and pond equipment are second to none. Nevertheless, there are important changes in the pipeline which will enhance the existing safety margins even further. **Dr Neville Carrington,** Chairman and Technical Director of Interpet Ltd, reviews the most significant aspects of the current debate.

Electrical equipment for use in aquariums and ponds has been in general use since the 1930s and has always enjoyed a virtually unblemished safety record.

This possibly led to a fairly relaxed attitude towards the design of the equipment which, by the 1970s, was certainly functional, efficient and reliable.

There was a British Standard for Aquarium Heaters (BS 3456 Pt. 3, Section 3.21). The Standard, which had been drawn up without proper reference to the aquatic industry, was virtually unworkable. However, this did not matter since it was not necessary legally to comply with the Standard. In addition, I think it is fair to say that nobody took any notice of it anyway.

All that changed in 1976 when the Electrical Safety Regulations were implemented (Electrical Safety Regulations 1975 [amended 1976]). These regulations apply to all electrical products, with the Trading Standards Department having the power to prosecute any manufacturers or suppliers not complying.

New requirements

The extent of these requirements caught manufacturers by surprise. It had been expected that the regulations would insist on the same standard as applied in most of Europe (CEE Publication 11, Part 2 Section C) but it transpired that they insisted on an extra layer of insulation which had to meet a rather stringent mechanical strength test. In practice, this proved almost impossible to reach technically and, after some time, the authorities agreed to a compromise which allowed (eg) the use of an extra-thick glass tube on aquarium heater/thermostats.

Following research work carried out by my company and others the British Standard was amended, so that a less severe "hammer Blow Test" is now required in order to meet the mechanical strength test.

The Hammer Blow Test consists of placing the heater/stat on plastic (polyamide) sheet which is fixed vertically to a solid "wall" and inflicting a blow with a "Standard Hammer" — the force of which is approximately equivalent to that produced by a nylon ball (weighing 40gm — 1.5oz) being dropped from a height of one metre (39in).

In Germany the Testing Authority had adopted a different approach, whereby a different form of extra insulation was required. There was also a fairly severe test whereby the unit had to be heated up out of water and then plunged into cold water.

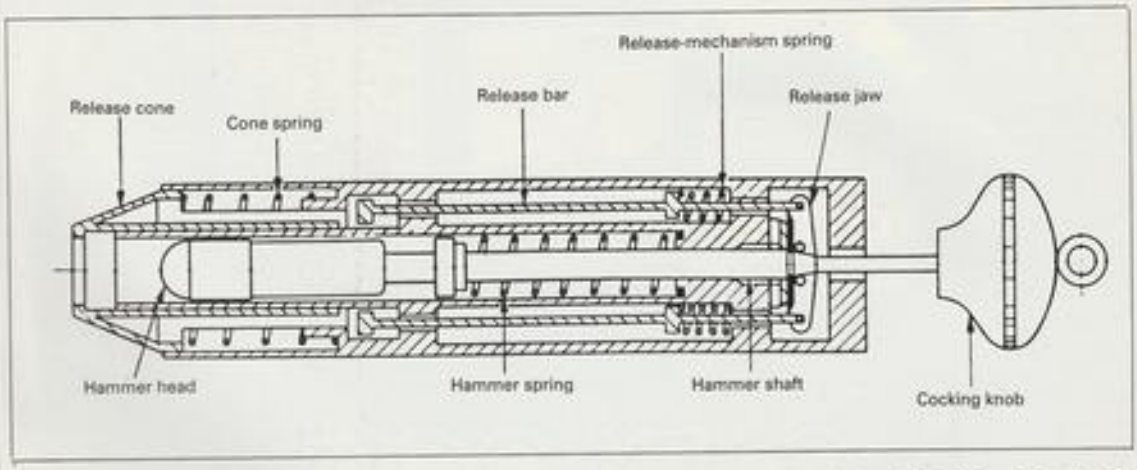
With the advent of the Single Market in 1993, a tremendous amount of work is taking place to harmonise standards of all sorts of things throughout Europe and electrical aquarium and pond equipment have not escaped the net. Manufacturers now have to regard it as essential that their equipment meets, first of all, the existing safety regulations which are almost identical to the existing British Standards (BS 3456 Pt. 3, Section 3.21 for heaters and 2.35 for garden pumps for instance — otherwise, in most cases, relevant continental standards are acceptable). The Consumer Protection Act 1987 makes it a criminal offence to supply any goods which fail to comply with the general safety requirements and this clearly applies to all levels of the aquatic trade.

We now have our own International Standard for aquarium electrical equipment! This is IEC-335-2-55 which was published last year. Garden pumps come under another Standard IEC-335-2-41. These Standards, with any modifications agreed in the meantime, will be adopted as the European Standard in about five years' time.

Growing awareness

Manufacturers in general are just beginning to realise that they have an opportunity to contribute towards the new Standard and also that they must be able to comply with it by the time that it comes into force.

Bearing in mind that it takes at least two years to design and test a new product and that European distributors will be looking for equipment complying with the IEC Standard well before the enforcement date, manufacturers are beginning to realise how important it is to become involved now.



The "Standard Hammer" used to test the strength of heater-thermostats. (Reproduced with permission, from BS3456: Part 3: Section 3.21. Complete copies of the Standard may be obtained from BSI Sales, Linford Wood, Milton Keynes, MK14 6LE. Tel: BSI Orderline — 0908 220022).

To give an idea of the growth of interest in this topic, the first meeting of the Aquarium Technical Panel was held in May 1987 with five manufacturers in attendance. By the time the second meeting was held on 12 October 1989 this figure had gone up to ten.

These meetings are held under the auspices of AMDEA, the Association of Manufacturers of Domestic Electrical Appliances. This Association is our representative, both to the government, and on various national and international committees connected with electrical standards and safety.

Besides the British organisations, I am in contact with Prodaf, the French pet trade organisation, who are talking with AMDEA's French counterpart. In addition IPTO, the International Pet Trade Organisation, tried to rally aquarium electrical manufacturers from all over the world in Paris two years ago but, amazingly, with virtually no interest.

Aquarium heater-stats, along with all other types of electrical equipment, will shortly be required to satisfy even more stringent safety criteria than they already do.

Positive meeting

A very positive meeting was held by AMDEA in London on 12 October 1989 and various important apsects of the new Standards were discussed. Basically, the first edition, as now published, of the IEC Standards incorporates all the most severe conditions from the various Standards which they have studied!

Various aspects of the Standards were discussed and, following the meeting, AMDEA agreed to make representations regarding the proposed mechanical strength test, thermal shock test in the new Standard, the necessity for garden pumps to be low voltage (as in the present British Standard), as well as details regarding the specification of the cable on garden equipment. Other items discussed included the new Standards against radio interference.

There was also agreement generally to support the proposals made by the French Committee.

Out of all the manufacturers and distributors of aquarium and pond electrical equipment in Britain, it is still amazing that so few should be prepared to put the effort into shaping their future. AMDEA has made a generous offer regarding the cost of limited membership of their organisation. It also provides very valuable technical back-up in certain circumstances, and it is difficult to believe that any serious manufacturer should not be involved.

As far as the consumer is concerned, the new Standards, produced with the cooperation of the industry, should lead to an even further enhanced margin of safety and, over the next year or two, the first evidence of products made to pan-European, and possibly pan-world, standard will come on to the market.

Seaview

by Gordon Kay

MCS marches on

It was wonderful to see the journal of the Marine Conservation Society — 'Marine Conservation' — in the autumn, so soon after the Society lost its offices in the fire.

For those who may not know, their offices were gutted by fire on 29 July last year, declared unsafe by a surveyor and sealed off. However, before they were locked out, the staff managed to retrieve fifteen trucks full of burned and sodden paper, which were transferred to temporary accommodation loaned by a local solicitor. These offices were only available for a month, but yet another member of the legal profession came up trumps with more temporary shelter, and so, the whole shooting match was moved again at the end of August.

The offices at Gloucester Road were being rebuilt but this was due to take until the end of the year. The stop press at the end of the editorial brought news that MCS was having to move again!

Throughout this chaos though, the staff at HQ managed to hold the whole thing together and the society has operated almost as normal. Better still, they managed to produce the best issue of MARINE CONSERVATION I've ever seen during my membership — including a wonderful colour underwater scene on the cover. Good on Yer, MCS — you have my unreserved admiration.

GOLDEN RULES (Part 1)

Talking to different audiences on my travels around the country, I am consistently asked about how to deal with disease problems. Why are my fish dying? Why do my fish keep coming out in white spots? Why can't I keep anemones? All manner of questions, all in the same vein.

I always tackle the questions by asking a few of my own in return. I establish how the aquarium is set up and run and what sort of maintenance programme is being carried out. In this way, I can get a complete picture and usually find the answer, which is invariably down to some sort of deficiency in the fishes' environment.

Given the correct care and conditions, coralfishes are extremely hardly and resistant to diseases, so it is much better to prevent trouble by practising good husbandary. The rules for this are:

1 GET THE ENVIRONMENT RIGHT FROM THE START

There is enough documented information about biological filtration around for everyone to be able to understand, but a few reminders here wouldn't be out of place.

From day one, the aquarium is being bombarded by fish waste, uneaten food and dead algae, all of which result in ammonia. This ammonia is lethal to fishes, and so, has to be converted — by biological filtration — to less harmful (but still toxic) nitrite and then to the relatively harmless nitrate. It is therefore clear that good biological filtration is the single most important aspect of a healthy aquarium.

The filter should be turning over water at a constantly optimal rate, should be constructed properly, and should be maintained regularly. The filter should, of course, be properly matured, and one should never keep more fish than the filter can handle.

2 MAINTAIN THE RIGHT CONDITIONS

Starting out correctly is not enough; we need to work to keep the aquarium running smoothly. Daily tasks should include checks that all equipment is working correctly, a check on specific gravity — so that extreme fluctuations can be avoided — and, of course, just watching the fish. By spending time just watching, you will soon get to know what is normal behaviour and what isn't, so that any signs of problems can usually be detected before it is too late.

Jobs to do on a weekly basis are checks on all water quality parameters, such as pH and nitrite. These, again, will signal impending problems. Rises in ammonia or nitrite are signs that either:

a) the filter isn't working properly

b) the filter is immature (too much stock for it to handle) or

c) you are overfeeding.

Addressing the problem will result in readings falling back to zero in a day or two. Falls in pH are an indication of the same type of problem, or it could be that you need to do a water change.

How about that for a link? The most important maintenance task of all is changing water, and I am convinced that this is the secret of keeping a healthy aquarium. This is not a view which is shared by everyone but — in my opinion — within reason, you can never change enough water.

3 BUY THE RIGHT SPECIES

Too many problems are caused by buying completely unsuitable species, so do some reading and ask some questions before buying anything. Buy only fishes which you know will get on with each other. Fishes which are being bullied or feel intimidated just will not eat properly, nor fare well generally, and all sorts of problems will ensue.

Buy only fishes which you know you can feed. There is nothing more heartbreaking than watching a fish slowly waste away because you cannot get it to eat. If this happens, then you can blame no-one but yourself because you bought a fish which you just did not know how to keep! (excuse me but I feel very strongly about this point).

Thirdly, and perhaps most importantly, is what I call the 'stock mix'. All too often, I see species like Tangs — which go beserk at feeding time — housed with Royal Grammas or other shy, slow-feeding species.

This is madness because, all the time, the aquarist is having to overfeed the aquarium in order to make sure the shy little fish is getting its share. In this way, the tank is always under threat and all manner of problems will result. Keep only fishes of the same disposition together for best results.

(**Golden Rules — Part 2,** will appear in the next installment of **Seaview**).

The Royal Gramma *(Gramma loreto)* could suffer at the hands of more boisterous tankmates. Compatible choice of fish is an absolute must.

Reflections

by David Sands

Rallying call

The American cichlid fanatics held a special 'get-together' in Florida last year, with some of the biggest names in the cichlid business in attendance. Ad Konings (whose new book on Malawi cichlids is another cracker), his diver/photographer friend, Horst Dieckhoff, our own Dr David Ford, Eberhard Shulze (who seemed to get on well with an American writing friend of mine, Lee Finley), Heiko Bleher (who gets everywhere), Ross Socolof, Dr Barlow, etc.

The massive group tripped around SeaWorld, had a special meal by the shark encounter, tripped the Florida Fish Farms, including a special visit to Ekkwill's and Don Conckel's Tropicals (he's a friend of mine from my Florida days), and had the opportunity to attend lectures from almost everyone, on a very wide range of subjects including the dreaded Angelfish Disease, Lake Malawi, Discus, Dwarf Cichlids, Lake Tanganyika (why wasn't I invited?), etc.

I can't help feeling we don't do it *quite* as big here in Europe. Whether it's apathy or lack of financial backing I cannot really say.

I fondly remember Ian Sellick organising a special convention at London Zoo, with lectures by collectors on Lake Victoria and on *Tropheus* and with the American author of The Cichlid Aquarium, Paul Loiselle, as one of the speakers. It was a fantastic day (at least for me), but I cannot lie about the attendance ... it was poor for such a big event.

Perhaps Coronation Street or the Grand National was on the same day ... something wasn't right. I doubt if the Cichlid Association made money that day.

Is it the aquatic industry that fails to support the hobby with publicity? Apparently not. 'Aquarian', for example have backed the Sandown Park A of A Fishkeeping Exhibition for several years. Tetra are running a series of 'fishy' evenings up and down the country this year. A tropical fish shop, Pier Aquatics, and Interpet sponsored the Northern Catfish Convention last year (and are doing the same this time round) and WHAT a success that was with lectures from Heiko Bleher and John Dawes ... (although, if I hear another lecture by Heiko on how he discovered South America before the great explorers I'll go nuts!).

Is it the aquatic press not putting up the money or giving events enough publicity? Well, *A & P* have supported the British Aquarists Festival and other national shows for 'Heaven knows' how many years. Some other magazines don't seem to have done the same ... but then that might be 'group' policy. One obvious answer is that if there is not enough money in the UK aquatic industry ... there MUST be enough in the European aquatic industry.

I would like to hear from company figureheads.

Could we not have a single get-together at the NEC, Birmingham? A celebration of Fishkeeping in 1994 or whatever....

Are you out there? Do you have the time to read magazines?

Maybe it's all of us. What do you think?

Vet search

How many out there would take a poorly fish to the vet's? Very few I should imagine. The old timers will tell you that they can treat all manner of viral infections and nasty things like TB with some of the most primitive dye treatments on Planet Earth. Of course they can't, but they do not tell you of the fish they bury ... they only speak of their successes!

Why should a fishkeeper *not* consult a vet when his/her Discus are suffering from severe bacterial infections or whatever? I have found most fishkeepers believe vets know 'nowt' about fish, and that it's not worth the aggravation. Maybe people believe that the cost will be too high. Few fishkeepers see themselves queueing up with Airedale Terriers and Persian cats with the old Oscar!

I've found vets are better versed in fishes than they used to be. Dr Peter Scott, a former Manchester-based vet, once in the famous Zoo Vet partnership (and co-author of a wonderful book, **You and your dog**, with David Taylor) has always maintained a strong link with fishkeepers and the fisheries. I wonder if he is a rare bird or not?

There *are* horror stories of vets prescribing antibiotics for the fish tank without realising that most antibiotics will strip the filtration of healthy, essential bacteria. I doubt if that happens very often now. I cannot see the local vet operating on a Red Tail Catfish with a broken dorsal spine, but I'm sure there are a few out there.

I would like to hear from people who have visited the vet and had good results or service and I would like to hear from vets who might wish to go onto a register as 'fish specialists' (or adventurers at least!).

Witch Doctor approach

I attended a special conference on fish diseases run by Tetra in Germany many years ago ... (I travelled via Munich and thought the trip was one of the most beautiful I've ever been on.) The conference taught me a great many things, but one of the most important lessons was that there's little point trying to identify diseases without a microscope. Any 'off the cuff' visual interpretation of signs is very 'witch-doctorish' and, well, we all seem to be capable of that.

I recently had an experienced fishkeeper customer who began to have a fish wipe-out. The fishes developed a patch of grey on their backs, did a spiral and then plummetted down dead. Without microscope examination it is impossible to even try to identify the disease.

I've heard many wipe-out stories these past few years and I ALWAYS wonder about the water supply.

There is something nightmarish about introducing alkaline water into a nicely mature and acidic 'happy' tank. We should test the pH of both tapwater AND tank water before mixing the two. We should use dechlorinators ... we should ask the water authorities why they have to lime the water. But do we?

Hope you are enjoying fishkeeping....

DAVID SANDS

Doing the rounds at one of Florida's major fish farms (Don Conckel's). We couldn't do the same over here, but we could, at least, run good conferences ... couldn't we?

A fully adult, fully coloured Odessa Barb male.

RUBY BARB FROM ODESSA

If you are looking for a small, colourful, active, hardy and easy-to-spawn barb, **Jiri Palicka** may well have the ideal fish to meet your needs.

(Translated from German by Cichlid Data)

Some of the more popular members of our aquariums are the fish of the carp family (Cyprinidae). Particularly popular with the aquarist are members of genera often referred to as *Puntius*, *Barbus*, *Barbodes* and *Capoeta*, mainly because these species brighten up the aquarium, are undemanding and not usually too difficult to breed. All are currently regarded by many authorities (pending a complete revision) as belonging to a single genus, *Barbus*.

In the seventies a new little fish, whose origin was described as southeast Asia, was bred in aquaria. It was referred to as *Puntius* sp. (now, *Barbus* sp.) and given the common name of the River Barb from Odessa since it originated in Odessa and was brought into Europe via Moscow. It was soon bred in European aquaria and, thanks to its appearance, soon became very popular both with breeders and aquarists.

Left, the more colourful male follows the female into the stand of fine-leaved vegetation where spawning will take place. Right, a mating pair of Odessas, well and truly "embedded" among the plants.

Identity problem

In the literature, the Odessa Barb was represented mostly as a variant of the barb *Barbus ticto*. The final analysis established it as a fish that was essentially close to the Cuming's Barb, *Barbus cumingi* in its development and morphological characteristics.

The male Odessa is recognisable by the lovely bright red colouring on its lower abdomen, which generally becomes more intensive in the mating season. The female is easy to distinguish, for she has no red colouring on her lower abdomen. She is silver to yellowy-brown and visibly rather fuller in the stomach than the male. During the mating season her colours are more yellowy-brown.

The dorsal, caudal and pectoral fins are adorned, in both sexes, by clear black stripes. On the lower abdomen both sexes have two black marks, as do the majority of the related species.

Maintenance and breeding

The Odessa Barb is very popular with

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CITES AND THE AQUARIST

The Convention on International Trade in Endangered Species (CITES) regulates trade in wildlife and wildlife products. It operates basically through listing species on Appendices I and II, with approximately 100 countries now being signatories to the Convention. Commercial trade in wild-caught Appendix I species is prohibited, with trade in Appendix II species being allowed under permit controls. In this article, **David Alderton** reviews three significant changes of interest to aquarists which took place at the CITES meeting held last October in Lausanne, Switzerland.

While the debate at the CITES Conference was dominated by the problem of illegal hunting of elephants for ivory, some of the other little-publicised decisions taken there should prove of interest to all aquarists.

Coelacanth

It's been decided to give official protection to the Coelacanth, a species which has a truly remarkable history. This, as far as we know, is the world's largest living vertebrate fossil, whose ancestors can be traced back 300 million years to the Devonian geological period. It was assumed that the family had become extinct around 90 million years ago, until the amazing discovery of a living Coelacanth barely fifty years ago, which shook the zoological world.

It was late in the morning of 22 December 1938, when Miss Courtenay-Latimer, the curator of the East London Museum in South Africa received a routine telephone call. One of the local trawlers had docked, and, as usual, she arranged to inspect the catch for any interesting specimens which could be mounted and displayed at the small museum.

On this occasion, there was a pile of sharks on deck but, among these, she spotted an unusual blue fish. It was 1.5m (5ft) long, and weighed 57.7kg (127lb). None of the fishermen recalled seeing a similar fish before, and, puzzled by its identity, Miss Courtenay-Latimer turned to Professor J. L. B. Smith, a noted ichthyologist based at Rhodes University, South Africa. From her sketches, he recognised the fish as one known only from the fossil record. He named it *Latimeria chalumnae*, in honour of Miss Courtenay-Latimer, with *'chalumnae'* referring to the Chalumna River, near where it was caught.

In spite of an intensive campaign to find further Coelacanths, it wasn't until 1952 that a second individual was caught. It then became possible to track down the main area of distribution for these fish, which is centred around the Comores Islands, located off the north-western coast of the island of Madagascar.

It is only during the last couple of years, however, that scientists have actually penetrated into the Coelacanth's environment. Using submersibles, a team from the Max Planck Institute in Germany, headed by Professor Fricke, have carried out investigations into the lifestyle of these fishes.

S. PRITCHARD

The Coelacanth is under serious threat — and full protection (at least on paper).

The Coelacanth is found in deep water, below 70m (230ft) and down to 600m (1,969ft) or more. It swims slowly, seeking the small, deep water fishes and cuttlefishes on which it feeds. Here, in the depths of the ocean, it has remained largely unmolested by human attention for millenia.

No one used to hunt Coelacanths. Those that were caught on lines were hooked by accident, instead of deep water food fishes. Coelacanths brought to the surface are destined to die soon afterwards, even if kept in water, because of the effects of sudden decompression and resulting respiratory complications.

The local people know the fish as *Gombessa*. It's not a popular food source because of its unpalatable oily flesh, although its rough scales can be used as a substitute for sandpaper.

Now, suddenly, the future of this unique fish is in serious jeopardy. Improved fishing techniques, which are the result of a Japanese Inter-governmental Aid Programme, have increased the possibilities of catching Coelacanths. In addition, these fish have become worth a fortune to local fishermen.

The government of the Comores purchases Coelacanths for about US $150. This is equivalent to at least three years' average earnings for the fishermen, and provides a major incentive to hook one of these rare fish. On the open market, Coelacanths can change hands for up to US $1,000 or more. This is partly because there is considerable interest in the spinal fluid of the fish, which the Japanese believe may contain an elusive elixir for longevity. If any of the research in this field proves even slightly encouraging, then the demand for further specimens will become overwhelming.

In addition, the New York Aquarium and the Explorers' Club have announced their intention to try to catch a live Coelacanth, to be displayed in America. Although this will obviously be a costly and technologically-demanding operation, if it were to succeed then other aquaria around the world would be keen to secure specimens.

It's estimated that at least 130 Coelacanths have been caught since 1952. There's no doubt that they are scarce. Although no reliable population data exist, the numbers being caught do not appear to be rising, in spite of much greater attempts to procure them.

Coelacanths are livebearing fish, producing as many as five young at a time, but we have no real knowledge about their reproductive rate. It appears to be low, which augurs badly for the future of a species under these pressures.

The CITES meeting decided to outlaw commercial trade in these rare fishes, by transferring the species to Appendix I. But, unless the Government of the Comores can be persuaded to protect its unique natural asset, then this may have little impact. Unfortunately, the present signs are not encouraging. The government uses prepared specimens as official gifts, and has offered them as tourist trophies, even openly advertising Coelacanths for sale!

Instead, what is undoubtedly needed is a bounty paid to fishermen to avoid areas where Coelacanths are known to occur, and the scientific expertise available on the Comores to enable these fish to be returned successfully to the sea if they are inadvertently caught. Otherwise, the demands of the Japanese and others will undoubtedly wipe out 300 million years of life in little more than half a century.

CORALS

While CITES generally acts to protect individual species, there was widespread concern among delegates over the future of coral reefs. This was manifested in the Israeli proposal to transfer all stony corals not already listed to Appendix II. There was some debate over taxonomy, in what is obviously a confused area. It also became clear during the discussions that the figures being used to show the trade in coral were unreliable, because they included large amounts of coral sand.

It was then suggested that the current level of international trade in living coral could be met from an area of reef of just 2 square

CORAL WORLD (T) LTD

It is estimated by some that an area of just 2 square kilometres could supply current levels of aquarium trade demand for corals.

kilometres in extent! The annual output from such a reef would be adequate, it was calculated, on a sustainable yield basis, to ensure that no permanent damage to the exosystem resulted.

It was also argued that impressions of uncontrolled, widespread destruction of reefs for the aquarium trade were misleading. In practical terms now, this Appendix II listing will, hopefully, enable better monitoring of the trade in living coral to take place, and more reliable data to be obtained.

ASIAN BONYTONGUES/ DRAGON FISH

Considerable debate featured on the subject of the Asian Bonytongue or Dragon Fish (*Scleropages formosus*), which is listed on Appendix I. Indonesia wanted to have its population downlisted to Appendix II, with an export quota. The quota was finally granted, starting at 1,250 fish for 1990, although it remains to be seen how it is to be monitored, bearing in mind the need to 'mark' these fish.

Another separate decision in which the proposal for the registration of commercial captive-breeding of Appendix I species was approved, could have a more significant impact on this Appendix I species in the future, leading to these fishes becoming more widely available. As a result, species listed on Appendix I which meet the criteria can now be traded more freely, effectively as Appendix II individuals, because they have been bred in captivity.

The breeders concerned must work in conjunction with their Management Authority (such as the Department of the Environment in the case of the UK) to develop the proposal. The central element is to show that the species has been bred to the second (F2) generation in captivity.

The proposal for registration can then be put forward for approval, either by postal vote, or at the next conference of the Parties which is scheduled to take place during the spring of 1992, in Japan.

Clearly, it should be possible to demonstrate this without difficulty in the case of *Scleropages formosus* (see for example, **The Dragon Fish Experience** by our editor, John Dawes, in the January 1989 issue of *Aquarist & Pondkeeper*) and breeders will then be able to trade their stocks more widely. So the future looks, at least, hopeful, for this spectacular species.

JOHN DAWES

Indonesia has now been granted permission to export some of its captive-bred Dragon Fish. This is a Red & Gold hybrid produced from captive-bred parents in Singapore.

Continued from page 14

breeders since it can be successfully spawned in small as well as in large tanks. In the company of other species, it is very lively and is not particularly aggressive, nor does it normally nip the fins of its partners as is the case with *Barbus tetrazona*, the Tiger Barb. Even so, it's best kept in shoals.

It is omnivorous but prefers live foods. If no live food is available, these fish also enjoy flake foods. It is also a good idea to give them a plant supplement such as a vegetable flake.

Some species of barbs are quite happy to damage small plants by pulling them out of the substrate. I have not, however, noticed the Odessa doing this. Only after a 14-day break in their food supply did the fish bite at the vegetation in my aquarium, but it was obvious that it was not to their taste. When fed regularly they avoid the plants.

For breeding I select the most lively and beautifully coloured fish which have already shown an interest in each other in the community tank. The readiness of the female is obvious by her fullness.

According to my experience, it is worthwhile having a tank with a large capacity (up to 60 litres — c 13.5gal), in which there is less likelihood that the eggs will be subject to fungus. After spawning the fish will immediately eat all the eggs they can find. Therefore if one is serious about keeping and breeding these fish a spawning grill or some other "barrier" must be used. Using this in larger tanks is more difficult, but it is still worth taking the trouble to do so.

The fish spawn on fine-leaved plants and on the bottom of the tank. I tried using a spawning mat but this did not work well as the fine fibres caught the fishes' fins and disrupted the spawning. Sometimes, in fact, it prevented them from spawning at all.

It is possible to put a pair of Odessas together in the tank at the same time. As soon as the fish have settled down, the male will begin to make moves towards the female. Spawning will often not actually happen until the following day.

Whenever I have observed a rise in atmospheric pressure, spawning has almost always been completed the following day. As soon as the first rays of the morning light fall on the tank, the male begins, untiringly, to make moves towards the female. He takes great pains to lure her into the plants and to get close to her lower abdomen.

Soon, the female stops resisting and follows the male. Together they swim to the plant they have chosen. The male then pushes his caudal (tail) fin over the female's back and holds her, and then leads her into the tangled plant growth. Sometimes the two fish will, literally, sink into the tangled growth making "cutting" movements as they do so, so that only the taut tail fins are showing. Following this, they both swim quickly around the plants.

At each of these acts, eggs are released and fertilised. The eggs are tiny and, because of the speed of the mating, are often difficult to spot. Each spawning burst yields 10-15 eggs and the whole process lasts almost three hours. The total number of eggs produced depends upon the size and age of the female, but can be around 250.

As soon as the spawning is over, the female shows no interest at all in remaining as part of a twosome. At this point it is necessary to remove the female, as the male's aggression after spawning is so great that the female will even jump out of the tank in order to protect herself.

Hatching and rearing

To develop the eggs successfully, it is best to have water with a low acidity level, and of a hardness of 2.6 dGH and 0.5dKH. It is not necessary to raise the temperature of the water; 22-23°C (71.5-73.5°F) is enough. At this temperature the eggs will hatch by the evening of the following day and the larvae will begin to swim soon after that.

After the yolk sac has been digested I feed the fry in the usual manner, i.e. infusoria, followed by Brine Shrimp nauplii, etc. The continued growth of the young fish is quite rapid and, after only six weeks, they can be transferred into the company of other fish.

As the above shows, the Odessa Barb is not a difficult fish to breed or to observe spawning. It certainly does not present any real problems as regards breeding or keeping, even to beginners. It is therefore a fish which I particularly recommend to anyone who wishes to keep barbs and wants a colourful, hardy, lively and trouble-free fish to start with.

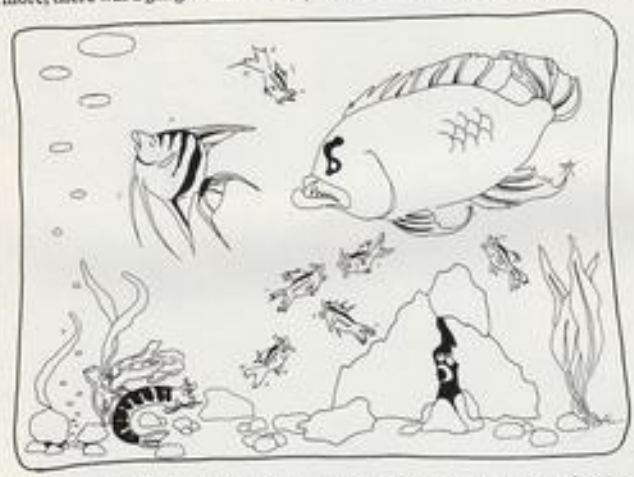
CONFESSIONS OF A COOLIE LOACH

David Franklin presents a novel and thought-provoking view of aquarium keeping — with a few home truths thrown in for good measure

I suppose you think that we, Coolie Loaches, are rather a secretive, anti-social lot who have nothing better to do than crawl around on our bellies looking for bits of food. Well, actually, you're quite right. It's not that we suffer from agoraphobia or some sort of inferiority complex, but it's just our way of life. Nevertheless, even though we're not wild party animals, we are keenly aware of what happens in and around our tank.

High-rise Coolie

I used to live in a kind of hi-rise flats complex at a garden centre. It was quite a rough area actually, with a ghastly cobblestone street which hurt to slither around on and was only advisable to bury in when you didn't want to hang on to your scales. Furthermore, there was a gang of marauding



juvenile delinquent Piranha opposite my home who greedily leered at anything that looked remotely fishy.

However, I made some good mates down at my local piece of slate and did not really want to move, when I made the fatal mistake of popping my head above ground to get a breath of fresh water. My future human 'owner' saw me and a queasy feeling came over me as I saw his eyes widen with curiosity.

I've seen that look before when a human has come into the garden centre, seen a particular fish and mentally said, "I must have that fish. I don't care how much it costs or whether it'll slaughter everything in sight. I must have that fish!" Symptoms of this remarkable condition include frantic searching of the pockets for some money, offering a part-exchange of just about every fish owned, and, in one memorable encounter, the giving of a phone number to a somewhat flustered garden centre owner.

Anyway, before I knew what was happening my home was being turned upside down as the shop assistant tried to catch me with all the subtlety of a JCB looking for worms. You'd think that my mild protests of zooming around the tank at a hundred miles per hour would be enough to convince him that I didn't want to move. However, it appeared that I didn't have much say in my change of residence, but at least I had the satisfaction of hearing the assistant mutter through clenched teeth, "If I ever see a Coolie Loach again . . ."

Confused Coolie

I arrived at my new home with six Neons, all in the same bag. It's not funny being stuck in an enclosed space with those fish — what, with having no eyelids! No wonder I swam straight into a rock when I was finally released. That day I was confused and disorientated (not to mention slightly concussed), so I spent it under the afore-mentioned rock.

I still chuckle when I remember the human cursing, "I spend good money on a flipping fish and it hasn't even got the decency to show itself!" What does he expect me to do after a violent change of surroundings? Perform handstands?

The next night I decided to explore what sort of luxury I was now living in. The first thing I noticed was the lack of life — just the Neons and me. But I assumed this would alter.

Human aquarium

I was impressed by the living space, but on the whole, the interior design left a lot to be desired. What did catch my eye though, and still intrigues me endlessly, wasn't even in the tank. I now know that it is called a television, but it seemed to me to be a kind of human aquarium. Funnily enough, watching all you humans scurry about calms me down, relieving me of stress.

I'm glad I've got the telly, as my girlfriend was left behind at the garden centre — some humans are so inconsiderate. I mean, what am I supposed to do on long winter nights now? How would you like it stuck on your own in an alien environment — a very alien environment, by the look of that bright red plastic plant over there.

Limitless human imagination

So now I live at a detached residence under a lump of bogwood, between an undergravel airlift and an interesting, if somewhat precarious, rock formation which apparently, according to the human, resembles Mount Everest.

An occupational hazard of being a fish is that you have to suffer being stared at for long periods of time. It seems to me that humans are lazy animals. A lot of the time, when you are collapsed in front of the aquarium, the only movement you make is with your eyeballs. It really annoyed me then when last week I heard one of you say, "Bah! Fish are boring. They never do anything". I thought, "What a cheek"! There's us fish swimming around, searching for food and generally being pretty active, when the most strenuous thing that you lot get up to is dangling your hand in the tank from time to time.

But humans make up for their obvious defects by being devastatingly original. Mine has given all his fish a name — I'm called 'Stripey'. Evidently, the boundaries of human imagination are quite limitless!

Inconsiderate humans

You might think that an aquarium is a very tranquil place where all the fish happily interact. Well, you couldn't be more wrong. Most of us don't get on, but it's not due to territorial or environmental reasons — it's because of personality clashes. Murder, lust, greed — they're all here; Albert Square has got nothing on us!

But if humans really thought about what they were doing, then they wouldn't be surprised to learn of this information. You imagine putting a whole load of humans from all four different corners of the world together, forcing them to eat the same food, all at the same temperature, and see how they get on. I think there'd be the odd "personality clash" too, don't you?

But humans are insensitive, arrogant creatures. They never consult us when they want to add someone or something to our home. So, you can imagine how I felt when my interfering owner decided to place a couple of Angelfish in with me.

I hate them fish! They're such snobs,

gliding around like they own the place, with hardly a civil word for anyone. They really do think that they're royalty. Well, I needed cheering up after those two, so I was pleased to see that the new resident was a Clown Loach. But I was most disappointed: he didn't make me laugh once!

Tank stud

However, after the clown came probably the most flamboyant character that I know. He is, of course, a large male Swordtail — the tank stud! He really does fancy himself and he'll chase anything female in fins. Of course, most of the time he's unsuccessful and the two females spend most of their day trying to get away from him. He'll usually swim up to them and say something really corny like, "Hi girls, why don't you come back to my place — the tank light's so beautiful up there at this time of year".

The Angelfish think he's immature and are sometimes disgusted with his, well, shall we say, very open courtship. I'm loathe to say this, but sometimes I can see their point. I'm no prude, but there are limits to public decency. If his chat-up lines don't work, he'll try to have his way with them anyway.

But there's a story about that sword that if he knew I was telling he'd kill me, as his cool and sophiticated image would be in tatters. The other day he was so immersed in himself, trying to look handsome in front of one of the girls, that he didn't notice she had slipped away, leaving behind a somewhat confused and embarrassed male Guppy in hiding for the rest of the day.

Talking of fish that are slightly funny, I'm not too keen on that new Gourami. I mean, you're just standing around minding your own business, when suddenly he's behind you touching you up. His hands get everywhere. The Angelfish definitely avoid him.

I wasn't too happy either when I learnt that a shark was to be added to our happy home, especially after watching "Jaws" on TV. I've already learned that humans are basically ignorant creatures when it comes to fishkeeping, so it wouldn't have really surprised me if the one who owned me tried to fit a two-ton, death-dealing Great White Shark into my four-foot home. Luckily, though, the new arrival turned out to be three inches long and red and black. He thinks he's a bit of a tough nut but, overall, he's not quite as dangerous as "Jaws".

Little defence

If my fears on the errors of human judgement proved baseless over the shark incident, then they were substantially reinforced a few days later. It seems that humans are a rather well-advanced species who have little commonsense. You put a man on the moon or fly around the world, but can you accomplish the somewhat easier task of putting the right fish together in an aquarium?

If you're honest with yourself, you have little defence. I know that I have the occasional habit of burying myself in the sand, but humans only bury one part of their anatomy — their heads. You rush into things barely considering any problem when it comes to us fish.

This was spectacularly illustrated when I watched in horror as an Oscar was being lowered into the tank. Why put an Oscar in with Neons and a Coolie Loach that looks too much like a worm for its own comfort? The Neons were so scared that they virtually fertilised the plants for the rest of the year! As predicted the Oscar (a Great White Shark in disguise) ate almost everything in sight.

That was one fish that actually liked his human owner. As the human surveyed his declining Neon popluation, he put it down to them jumping out of the tank, even though by now the Oscar had a belly as big as it could get and a smile to match.

Now, I'm no fool, but I'm pretty sure that your average Neon is physically and psychologically incapable of jumping through a cover glass and an aluminium roof at once (even while being chased by a hungry Oscar). Where are the RSPCA when you need them? It took five Neons for the human to realise his mistake. Oddly enough he blamed the Oscar for the deaths, and all because he had a healthy appetite!

Well, as you've probably guessed, I haven't got too high an opinion of the limited range of humans that I've come into contact with. Perhaps, I should stick to watching TV. But, at least, my life is never boring — I await future developments with interest. To be fair, everyone makes mistakes, but the novice fishkeeper must make more mistakes than any other being alive . . .

Letters

Misleading TV advice

I must comment on something I found very misleading and away from the truth. I refer to a recent television programme, which was available to audiences up and down the country on Christmas Eve. The title of the programme? Of course, you do not have to guess: **Fish People.**

An otherwise excellent show was spoiled by a lady who resembles Her Majesty the Queen but who, alas, appears to possess little knowledge relating to life in water. I would agree with her views on pond creatures if this climate we live in were tropical, but her 'advice' left me cold.

Some of our waters have become polluted through agricultural and industrial sources but, in general, such conditions are well indicated . . . but I digress; the lady was highlighting the actual inmates. The average pond, especially one of the garden variety, has no hidden dangers, particularly from the "creepy crawlies" to which she refers.

How many parents will there be who take heed of her warning and ban their offspring from the healthy exploration of nature we were all used to as youngsters? I, for one, have collected water life specimens on many occasions; I started when my age was in single figures and still do from time to time. In the future I hope to carry out a study of dragonflies, and that will involve numerous ventures in the quest for their aquatic larvae. Don't forget also that many aquarists go 'dipping' for live food.

Children must be encouraged, not deterred, from examining ponds and ditches for the little animals that live there; it is an added interest; it encourages them to value our ever-decreasing countryside on the whole. There are the occasional aquatic insects that 'bite'; a piercing probe from one of our aquatic bugs, namely the Backswimmer or, alternatively, the Saucer Bug, can be quite painful if the insect is not handled correctly. There is no danger in these bites, however.

The reference to "creepy crawlies" getting under the fingernails and causing damage was utter nonsense. Please, general public, ignore the advice of this lady; there is nothing to fear from these creatures. Just make sure that you impress upon your children that fingers are not for sucking, and that hands are to be throughly washed after an expedition to the nearest pond.

We are, seemingly, surrounded by so many dangers these days, or so the media tell us, that it is a wonder we are not all wrapped in cotton wool!

Vernon Hunt
Widley
Hants

FOR MORE LETTERS, SEE PAGE 68.

We welcome readers' views on all aquatic, herpetological and conservation matters. Please address all correspondence to: Letters Page, *Aquarist & Pondkeeper*, 9 Tufton Street, Ashford, Kent TN23 1QN.

News

Catford's Petworld

Michael Olsen, founder and Managing Director of *Petworld*, claimed to be the largest pet shop in Europe.

Petworld, a new retail outlet which claims to be "the largest pet shop in Europe", opened its doors to the public on December 2, 1989.

Aiming to stock 2,500 pets (presumably not counting the hundreds of Neons and Guppies), and over 5,000 associated pet accessories, the company plans to provide "everything from Goldfish at 95p, to pedigree cats and dogs, all kinds of rodents — hamsters, mice, gerbils — rabbits, canaries, parrots and Koi (kept in a 1,000 gallon — 4,500 litre tank)".

The 90 tropical and nine marine aquaria, along with nine Goldfish vats and medium-sized Koi pool, were not fully stocked at the time of opening — a case of apparently being badly let down by suppliers. Nevertheless, it was obvious to see that the layout is both interesting and hygienic. The shop, both in terms of pets in general, and aquatics in particular, is well worth a visit.

For further details, contact **Petworld, 163-165 Bromley Road, Catford, London, SE6. Tel: 01-698 1232.**

Vetcall's cold-blooded service

Vetcall, the 24-hour telephone information service, offers advice on a wide range of pet care topics, including the provision of adequate conditions for coldwater organisms like fish and reptiles. So, if you would like to know more about looking after pets in winter here are some useful numbers to dial:

Cold-blooded animals
0836 400 533.
Tortoises
Housing, feeding and hibernation: **0836 400 534.**
Terrapins
Housing, feeding and general care: **0836 400 536.**
Snakes
Choice of species: **0836 400 537.**
Housing, feeding and general care: **0836 400 538.**
Fish
Water quality and setting up a tank: **0836 400 539.**
The garden pond: **0836 400 540.**
Coldwater fish indoors: **0836 400 541.**
Tropical fish and marines: **0836 400 542.**

For a free Vetcall directory, listing all 144 topics, call **0898 600 600.**

All the Vetcall information has been produced by veterinary surgeons and approved by the British Veterinary Association and the Royal College of Veterinary Surgeons.

Calls are charged at 25p per minute, cheap rate, and 38p per minute at all other times (including VAT).

Vetcall does not diagnose conditions and should not be seen as a substitute for visiting the vet.

For further information, contact:
Suzanne Frost or Marilyn Dummer, Air Call Medical Services Limited, 401 South Row, Central Milton Keynes MK89 2PH. Tel 0898 691919.

Nishikigoi International in New York

Many of you will have heard about the specialist Koi publication Nishikigoi International, jointly edited and published by regular *A&P* contributor **Nigel Caddock** and his 'partner in crime' **Greg Peck.**

Nishikigoi International aspires to offer Koi-keepers high-quality information and photographs and is specifically produced to meet the specialist information needs of such hobbyists.

In addition to Nishikigoi International, Nigel continues to make regular contributions to *A&P*, and in this issue, a self confessed obsession with Kohaku is described, and illustrated using a superb colour photograph of a stunning Dainichi Kohaku.

The international flavour of Nishikigoi International is illustrated on the photograph, captured by Nigel on a recent trip to the US, which shows International NI subscriber **Dr Jas Singh** with his copy of the autumn '89 issue. Liberty island on the Hudson river entrance to New York tends to get a little chilly in December — on this day it was −15°F (−26°C)! with an icy wind chill making the designer woolly headwear mandatory.

As a growing number of Koi-keepers throughout the UK and all over the world respond to the availability of a quality specialist Koi publication, *A&P* wish Nishikigoi International continuing success and look forward to working with them to bring all Koi-keepers more expert information throughout 1990.

For further information write to: **Nishikigoi International, Highways, 109b Snowdon Avenue, Urmston, Manchester M31 3EF. Telephone 061-747 3390.**

Golden Phoenix agent

Ash Holt Aquatics of Doncaster have recently been appointed UK agents for Golden Phoenix Fisheries of Hong Kong. Details about Golden Phoenix released by Ash Holt state:

"Golden Phoenix are well established and reputable breeders of quality Fancy Goldfish, with brood farms in the Zumchu, Tungkoon, Fuk Chou, Hangchow, Naking, Beijing (Peking) regions of China, and a central farm in Hong Kong. All fish are fully conditioned and carefully selected before packing and shipping. A very advanced treatment is added to packing water to pacify fish, reduce ammonia and promote adequate slime coating".

For price lists and terms on fish offered to both wholesalers and retailers in the UK, please contact **A. Hudson, Ash Holt Aquatics, Bank End Road, Finningley, Doncaster. Tel: 0302 771667; Fax: 0302 770877.**

NEXT MONTH
COLOURFUL COLDWATER SUPPLEMENT

SPARSHOLT THREE YEARS ON

By Keith Davenport — Course Tutor — National Certificate in Aquatics and Ornamental Fish Management Course.

Students installing a range of aquaria in the exhibition area of the 'Cowshed' which underwent a dramatic transformation and became the National Aquatic Training Centre.

It is only three years since Sparsholt College Hampshire became aware of the keen interest the aquatics industry showed in training.

At that time we found an increasing number of young people entering our Fish Husbandry Youth Training Schen. : from the aquatics industry, even though it was aimed primarly at those wishing to enter fish farming or fishery management.

We prepared a questionnaire and sent it to 240 aquatic businesses not anticipating much, or indeed any, positive response. Normally, such a mailshot might expect a return rate of 1 or 2%, perhaps a maximum of six replies. A staggering 74 were received!

These indicated a requirement for over one hundred additional staff — preferably trained — in the following two years. Thus, the seeds of the first full-time training courses for those specifically wishing to enter the aquatics industry were sown.

National Aquatic Training Centre

EEC milk quota regulations meant the College had to disperse its herd of Guernsey cows. Their milking parlour therefore became redundant and available for other uses. It was decided that this building, 'The Cowshed', should be converted to meet the training needs of the aquatics industry. Milking equipment and calf pens were removed, new walls constructed, and en electrical system and false ceiling installed. Meanwhile, a request for help was sent to a large number of companies within the industry so that the venture could be given a flying start.

Little did we realise the tremendous whole-hearted and enthusiastic help we would receive. To date around 60 companies have offered help. This support has taken the form of goods, money, space at shows, etc, etc.

Very importantly, people have always given time to provide advice and come to the College to talk to the students or offer students block release practical placements. The industry deserves great credit for its positive approach to this training initiative, and the College is most grateful.

National Certificate

A syllabus was prepared for, presented to, and approved by, the National Examination Board in late 1987. The first fifteen students successfully completed the one-year National Certificate in Aquatics and Ornamental Fish Management in the summer of '89, having commenced the previous September.

The students came from very different backgrounds and included an Upper Second Class Honours Zoology graduate, a chemical engineer, several who had just completed YTS in Fish Husbandry or Horticulture, a trained arboriculturalist and a driving instructor, among others.

During their year at the College they experienced both the exasperation and satisfaction (inherent in any project) of converting the cowshed into a building recognisable as the National Aquatic Training Centre. The course is a very practical one by its nature and these students set to with a will.

Successful students

Three students, Richard Downes, Richard Ferrari and Robert Leach received Distinctions and nine others received certificates at Merit level. Additionally, Richard Downes received the Rolf C Hagen (UK) Ltd Trophy — an etched glass bowl — for being best overall student. He is now working at Turners Hill Garden Centre near Crawley in Sussex. Robert works for J & K Aquatics in Wellington, Somerset.

Richard Ferrari has set up a retail business, 'Aquatechnic' at Attleborough in Norfolk and recently said " . . . it is a course ideal for anyone considering entering the aquatics industry. The depth of practical skills and theoretical knowledge is of a standard high enough to understand most subjects and allow for specialisation in any given field. This is demonstrated by the range of jobs taken by other students from my group."

Philip Gray received the Beaver Water Plant and Fish Farm Award for the best student in Aquatic Plant Husbandry among those on the course. He then went on to work at the Hustanton Sea Life Centre. Two other students, apart from Richard Ferrari, established businesses of their own: Richard Brabazon at Home Farm Water Life, Ardington in Oxfordshire and Tony Gillmore — T Aquatics at Minster on Sheppey in Kent.

The other successful students entered a variety of jobs in, for instance, public aquaria, building and managing aquatic outlets, retailing, importing and technical development.

Seven students started the course in September 1989 with an equally diverse set of backgrounds and ambitions. Among the practical tasks they are tackling is a retail type display of tanks for which they will construct everything and breed or propagate some of the fish and plants to stock the tanks.

Plant care and propagation form a important feature of the course. some of these plants are used to stock ponds installed by the students.

Conference and Short Courses

As well as providing full-time training in 1988/89 we offer a range of short courses to those working in the industry. Fish Disease and Plant Retail and Display courses were particularly well attended. Peter Scott the well known 'fish vet', provided expert tiution on the former, while Jeremy Abel and Tim Williamson from Anglo Aquarium gave expert advice on the latter.

The first Aquatic Trade Conference was held at the College in July. This provided a forum for discussion of a range of topics and a chance for members of the industry to meet informally. The success of this conference has convinced the College that it should be an annual event, and the second conference will be held on Monday and Tuesday 16/17 July 1990. Among the topics to be covered are UK production of coldwater ornamental, tropical freshwater and marine fish. A guest speaker from America who will speak about North American Species as ornamentals is being sponsored by 'Aquarian'. Fish diseases, conservation, fish vaccination and the role of the manufacturer in helping the retailer will also be covered.

The future

Starting in September of this year, the College will run a two-year full-time Diploma course. It will equip students, who would normally have 4 GCSE at grades A, B or C, plus industrial experience, to adopt a managerial position early in their careers.

It will cover all the subjects covered on the National Certificate course, but will concentrate to much greater detail and depth on the retail and business management aspects.

Additionally, because many aquatic outlets stock a range of pets, other than fish, small animal care will be included in this course.

Further information about the college can be obtained from **The Principal, Sparsholt College Hampshire, Sparsholt, Nr Winchester, Hampshire (Tel 096 272441)**. Particular information can be obtained from: **Keith Davenport** (full-time courses); **Fiona Fielder** (short courses); **June Lloyd** (Conference Director).

Spotlight on Koi

Koi Talk

By John Cuvelier

Sad news

I almost asked our editor to place this month's offering inside a black border to mark the passing of the largest and oldest member of our Koi family, the wonderful 'Maggie', who had been with us for some 17 years.

Maggie was a Kohaku with Sanke tendencies and measured 27in in length, with a girth of almost 18in. Throughout her life she had been the cause of many an 'Ooh and Ah' from passing visitors and friends alike. Her exact age must remain a mystery, as she was already of considerable size when we adopted her, but a 'guesstimate' would be around 25 years. We feel that old age just crept up and carried her away as nothing else was evident.

We shall miss the sight of those 'lipsticked' lips coming up out of the water to greet us whenever we approached the pool. Our one consolation is that she did not linger for long and suffer. To my eternal shame I don't have a photograph of her good enough to reproduce in this column, otherwise it would have been here.

Exciting prospects

Turning to things less sad, I hear on the trade 'grapevine' that 1990 will see an increase in the import of newer and therefore rarer (to us in the UK) varieties of Koi.

Personally, I can't wait, even though I shall never be in a position to possess such beautiful creatures. Spare a thought for the many, many years of hard work, coupled with much disappointment, which go into the successful launch of yet another variety. I suppose one could compare the situation of a Koi breeder with that of a rose grower trying to achieve a perfect black bloom.

I also suppose when one is breeding fish for a living, of necessity, one needs to develop a degree of hardness in order to survive in a hard old business world. Nonetheless, I can't help feeling that when the time comes for a breeder to carry out the first cull of a spawning, destroying all the deformed and colourless fry which are inevitable in every hatching, there must be a slight feeling of, dare I say it, guilt? I only know I couldn't do it, which I suppose is as good a reason as any for my not going into the fish business!

Acid thoughts

While on the subject of rain, I've been carrying out regular pH checks during the downpours and any hopes of finding rainwater of pH 7 or above has been dashed. What on earth are we doing to this planet of ours? The highest reading obtained was 6.9 and the lowest an incredible 6.4, with the wind blowing from the south-east!

These tests, incidentally, were carried out with a Lovibond 1000 Comparitor, far more believable than these electronic gadgets which seem to vary depending upon the users' ability to stir the test sample.

I dread to think what the pH of our tap water would be, were it not for the liming, etc, carried out during treatment at the various treatment works around the country.

Fortunately, thanks to the massive dilution which takes place in the average Koi pool, acid rain only has very negligible, if any, effect upon water quality and therefore does not harm the ecology of our fish. It would, of course, be very silly deliberately to collect rainwater to use for topping up purposes, as this is really asking for problems. I've managed to dissuade more than one hobbyist from doing this, in particular one character who proudly showed me a large container which collected all the rainwater from his house roof, complete with all its 'nasties', would you believe?

ERIC CROCHTON/BRUCE COLEMAN LTD

Koi and humans form lasting relationships. Parting can be painful.

Zeolite solution

One of the more enjoyable occupations for the experienced Koi-keeper must surely be that of passing on all the accumulated knowledge gained over the years to a raw recruit to the hobby.

My next door neighbour is a case in point, as we spend many an hour simply talking Koi. Facts which I have taken for granted over many years appear almost magical to him and provide much mind-sharpening dialogue.

Take zeolite for instance. Having casually dropped this word in one of our discussions, along with a brief outline of its properties, my friend immediately envisaged a ready solution to all his filtration problems (some of which have not even made themselves apparent, but you know Koi-keepers, always looking for a solution before a problem appears)!

I think he had visions of a chamber full of zeolite replacing his gravel media and any maintenance thereof. As I quickly pointed out, while zeolite certainly has some interesting properties, it certainly will not replace existing biofiltration.

This natural hard clay-like material hails from Japan and has the property of being able to 'strip' ammonia and nitrites from water by means of absorption. It will also have some effect upon gaseous chlorine in water by the process of adsorption (condensing the chlorine on to the surface of the clay).

The ideal method of using this material (in my opinion, I stress) is by suspending quantities of the material in net bags inside the final chamber of a filter system where it will pick up any ammonia, etc, missed by the filtration. Eventually, the material will cease to work owing to saturation with 'nasties', and will then require rejuvenation by immersion overnight in a strong salt solution, after which it must be washed down and allowed to dry, ready for another tour of duty.

Pools using zeolite should not have salt added for medicinal purposes as this will immediately cause the zeolite to release any ammonia already absorbed back into the system.

The material is sold by weight, and here lies the first snag. As it is quite a weighty material, you don't get much zeolite for your pound initially, a 20Kg bag not being anywhere near as much as you'd expect. So what's new? Not that that should matter, as Koi-keepers seem to have the ability to fund their hobby, come what may.

Squelchy end

1989 certainly went out with a bang, or should I say squelch (?) in our little patch of border country.

Following several days of very heavy rain during which our third of an acre paddock became a giant lake, not for the first time I might add, I suddenly became aware that my filter was not running. Thinking that perhaps the trip had operated because of the excessive dampness, I lifted the lid of the main pumping chamber and discovered to my horror that both central heating pumps had become submersibles!

Needless to say, they and I did not appreciate this change of status. The fact that this chamber had been in operation for almost seven years and remained perfectly dry had resulted in a degree of complacency creeping in; that old enemy of Koi-keepers everywhere!

The price of complacency — a flooded pump chamber.

Fortunately, our Koi had not suffered, and the first replacement pump was soon fitted, this time having had every possible jointing surface sealed with silicone rubber (ready for the next time?). Nevertheless, this was an expensive lesson learned.

New-season thoughts

If you keep your fish outside in their pool throughout the winter months, as most of us do, by the time you are reading this we will be approaching that critical period of the year, the start of a new season.

Now is the time to keep an eye peeled for signs of any abnormal behaviour on the part of the favourite fish (Sod's Law dictates that if anything crops up, it will be with your favourite)! After the stresses of winter, your fish will be at a very low ebb and in fine condition for attack by sundry ailments, even in pools with a high standard of husbandry.

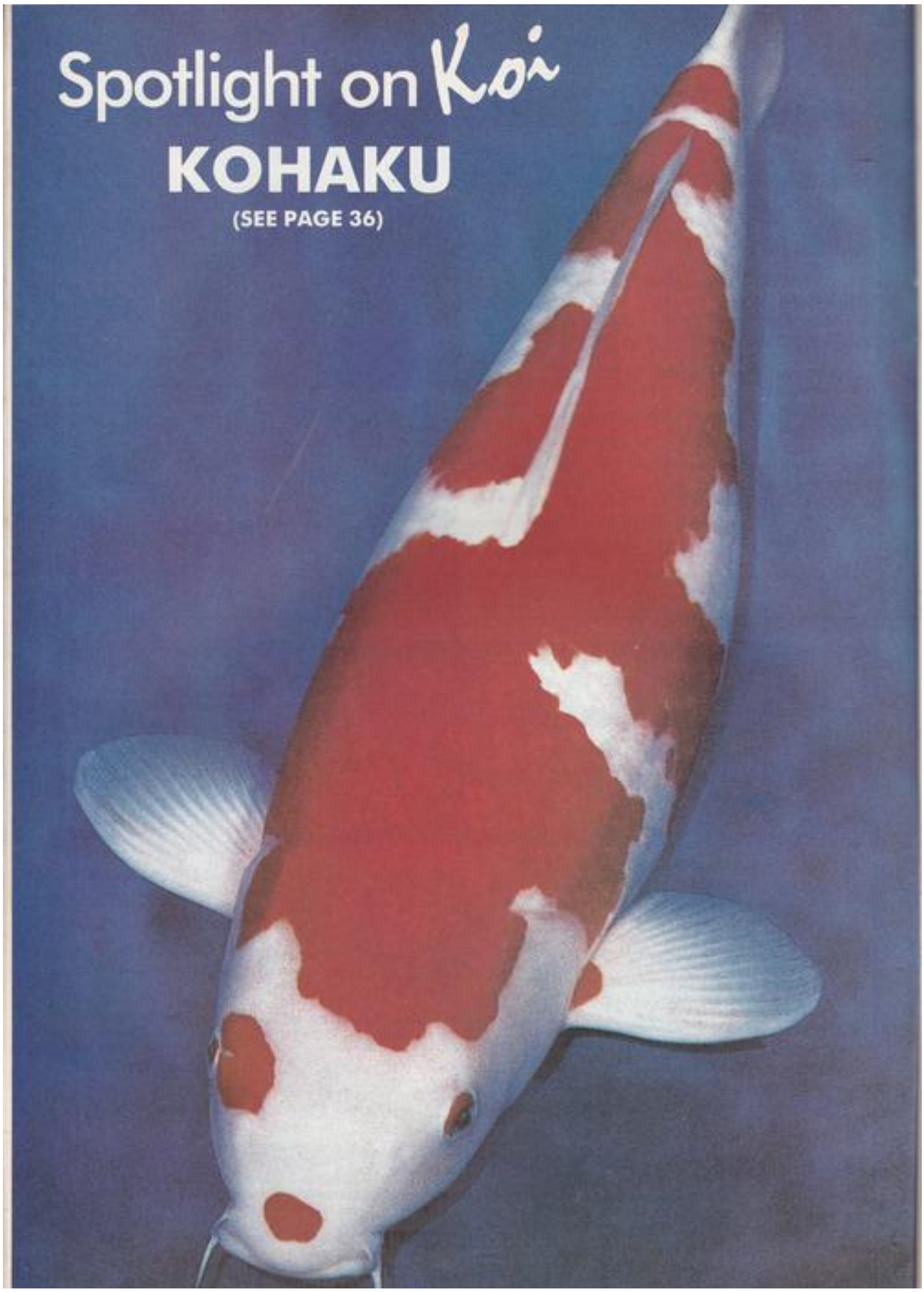
Should you be unlucky, it is good advice to defer, if possible, any treatment involving strong medication, at least until your fish have regained a little of their strength, as in these circumstances an attempted cure could well lead to the early demise of a fish.

The odds against your pool falling prey to an infestation of Anchor Worm or Fish Lice are pretty low, assuming you have not introduced new fish which are, themselves, infected, but you might well be faced with an outbreak of flukes, depending upon how quickly the water heats up in the spring. Flukes are seldom fatal in the short term, being merely irritating to the host, so you can allow some time for the fish to build up their strength before treatment begins. ALL fish carry a population of flukes, but the spring can often signal an explosion of these pests if the weather has been exceptionally mild very early in the year.

Sadly, there are cases when a fish simply seems to fade away without any visible signs of illness, despite valiant efforts on the part of its owner to save it. These cases we simply have to accept. Like us, fish occasionally develop internal ailments like growths, blockages of the intestines, and the like, which are quite beyond the capabilities of the average owner to cure; even a vet would be hard pushed to help. There are even recorded cases of Koi suffering heart attacks through being frightened by sudden movements around the pool.

If you think I've chuntered on too long this month, blame the editor, as it's all his fault! Isn't it always? See you next time.

Alternative ways of 'packaging' zeolite for pond use.


Spotlight on Koi
KOHAKU
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Spotlight on Koi

KOHAKU

They say that Koi-keeping begins and ends with Kohaku. Nigel Caddock of Nishikigoi International* shows why.

(Photograph: Nishikigoi International.)

There are, traditionally, three varieties of Nishikigoi that, more than any other, epitomise what Koi are really all about. These are the elite of the varieties and are collectively called 'Go-Sanke'.

The three Go-Sanke varieties are Kohaku, Taisho Sanshoku (Sanke), and Showa Sanshoku (Showa). More recently, a fourth variety, a 'young pretender' to the throne of excellence, has also begun to become highly regarded. Shiro Utsuri are now similarly revered and are seriously beginning to challenge for Go-Sanke status.

Arguments over which variety is most important are totally legion, and it is my view that it matters not a single jot what anyone else likes or says is best; everyone should enjoy what THEY like, regardless of what variety is concerned. However, one thing is certain; in the birthplace of Koi, Japan — the three Go-Sanke varieties reign supreme.

Supreme Kohaku

Of the three Go-Sanke varieties, Kohaku, is the undeniable supreme master. The Japanese are a fiercely nationalistic race, and many have speculated that the reason that the Kohaku reigns supreme is that the combination of red and white reminds the Japanese of their country's flag.

The fact is that the Kohaku is the king of Koi, and it has been said that Koi-keeping begins and ends with Kohaku. It is often the first Koi hobbyists buy because they are attracted by the Hi (red) and it is also usually the variety chosen by the experienced Koi-keeper who is beginning to understand the essence of the hobby and truly appreciates the difference between 'boring' and 'uncomplicated'.

I confess to being besotted by Kohaku and find it almost impossible to explain why I prefer a simple two-coloured Koi to some of the magical three-coloured combinations seen in the Sankes and Showas.

What I can say is that the subtle skin tones and fascinating patterns seem to attain almost three dimensional depths in the truly excellent specimens, and the lacquered luminescence of the skin quality of the best grade Kohaku sends tingles down my spine.

Essential bloodlines

There are many breeders of Kohaku and all the best have a common factor — a well established and supreme bloodline. There are, of course, a myriad other factors which determine which Koi actually develop into excellent specimens but, of all the many factors, bloodline is the most important.

Many contemporary Kohaku evolved from a bloodline call Tomoin. This includes Dainichi and Manzo which many readers may have heard of. In addition, there are others which produce superb Kohaku; these include, Sensuke, Torazo, Hasegawa Manzo and, most recently, Hensuke.

The Koi featured in the photo is a Dainichi Kohaku. Until recently, Dainichi was relatively unchallenged for Kohaku, producing excellence, but it is only in the last five years that the many years of time, effort and hard work of the afore-mentioned have really begun to pay dividends, with spectacular results.

It is important to understand that other breeders produce superb Kohaku also, and I am certainly not inferring that if a Kohaku does not come from one of the aforementioned, it is no good. What I do say is that Kohaku which are traceable to excellent bloodlines have inherent quality and a stability that often means they will keep on improving as they grow and develop.

One Kohaku dealer who epitomises, perhaps more than any other, just what can be achieved, is Hasegawa of Ojiya, Niigata, who has developed his own bloodline over the past twenty years from Manzo parent Koi.

Unique qualities

No two Koi are the same. This is part of their magic, and this 'snowflake' quality ensures that everyone with a Koi has something unique that no one else can ever have. Quite a thought!

Although every pattern is different, there are identifiable pattern types, the appreciation of which can often help to sort out the many variations.

There are two main pattern types: firstly, straight Hi patterns, where the Hi (red) stretches the whole length of the body without a definite break, the white skin breaking through only below the dorsal line of the Koi. An example of this is an Inazuma (lightening) pattern, which zig-zags down the Koi's body.

It is true to say that, although straight Hi patterns are very attractive and very desirable in baby Koi, in adult and mature Koi, the second main pattern type, stepped patterns, is generally much preferred and more desirable. This is clearly a generalisation, and there are some staggering examples of straight Hi Kohaku that prove the exception to this very general rule.

There are various stepped patterns:

Nidan — Two Step
Sandan — Three Step
Yondan — Four Step
Godan — Five Step

Choosing Kohaku

Whatever you choose, look carefully, try and identify the difference between the patterns and select the ones YOU like. A few cautionary words, however. When selecting baby Koi, select a Koi with lots of Hi. This is because, as the Koi grows, the base white skin will develop more than the Hi.

Also, take careful note of the head pattern, avoiding *Menkaburi* head (hooded — where the Hi covers the head completely). Try to find a Kohaku where the Hi comes down nicely to between the eyes and not below them. Kohaku head Hi is the most stable on a Koi's body and the head pattern a Koi is born with tends to stay with it through its life, while its general body Hi pattern often changes dramatically.

Pay attention to the Ojime (gap between the last Hi mark and the tail). If this gap is too big when the Koi is small, it will be far too big when the Koi has grown.

You should look for a good, consistent Hi and good, crispy white base skin. The Hi should have a blurred leading edge and sharp following edges. The base white is very important and will give you a good clue to its basic quality.

Hi and Hi

I have left probably the most important factor till last. Hi is Hi, you may think, but that is far from the case. In Kohaku, there are basically two types of Hi; orange-based Hi and purple-based Hi.

Although the purple-based Hi often looks very attractive and appears deep blood-red, it is less stable and less desirable than orange Hi which complements base white in a far more elegant combination and is less likely to break up as the Kohaku grows.

In addition, some of the very red Hi is artificially induced by intensive feeding of colour-enhancing food. This looks great until you feed your fish normal food when the Hi breaks up and can even disappear completely, turning your lovely Kohaku into a Shiro Muji! — but that's Koi-keeping.

* Nishikigoi International is a UK specialist Koi magazine. It is a quarterly publication produced jointly by Nigel Caddock and Greg Peck and offers high-quality Koi information with lots of colour photographs. For further information ring 061-747-3390 or write to: **Nishikigoi International, Highways, 109b Snowdon Avenue, Urmston, Manchester M31 3EF.**

Spotlight on Koi

BREEDING KOI

Breeding Koi is somewhat more involved than breeding, say, Guppies. But is it worth the effort? **Roger Cleaver** is among those who most certainly think it is.

(Photographs by the author)

With the coming of spring and, hopefully, some better weather, many people begin to think about the subject of spawning their Koi. Does the subject need much thought? The answer is, yes, if you wish to stand the best chance of rearing some of the fry that your fish are capable of producing.

Japanese-style breeding ropes.

Appropriate diet

What, then, are the problems facing you if you wish to spawn your fish? Firstly, the fish need to be in good condition, of course. This is necessary if the fish, particularly the females, are to achieve spawning readiness. Females carry eggs for most of the year, but insufficient food, or poor quality food, can result in the eggs failing to complete their development in time to be released in a spawning that year.

In the case of Koi wintered in an unheated pool, their conditioning should begin as soon as the milder weather arrives in the spring. Good quality, easily digested foods, such as wheatgerm pellets, should be fed once a day as soon as temperatures begin to rise to about 50°F (10°C). High protein foods should be avoided at this time as the fishes' metabolism will not yet be able to cope with this type of diet. As the weather improves, include standard Koi pellets in with the wheatgerm and feed more often. Once temperatures reach the high 50's F (around 15°C) then high protein foods can start to be fed, and food can be offered all day long.

Spawning techniques

Given reasonable weather and feeding, Koi attain spawning condition some time towards the end of May or during June. Once in condition, if left to themselves, they should spawn naturally. Some of the eggs should survive and hatch, and you should be able to save some of the resulting fry. This may be the extent of your interest in breeding your fish, but many people want to take it a stage further and try to rear a larger number of fry than it would be possible to save in this way.

One method of achieving this is to allow the fish to spawn on some form of spawning material which can then be removed. Either

Male Koi viewed from below.

Female Koi viewed from below.

A temporary pool made by using straw bales and a liner.

natural or artificial spawning media can be used. Hornwort and Water Hyacinth make ideal natural materials. Some Japanese breeders also use the roots of the willow or the leaves of the cedar tree for spawning purposes. Several types of artificial spawning media are commercially available, the best — in my opinion — being the Japanese-style Koi ropes, or the foam spawning mats. You can even make your own, using nylon rope or baling twine.

Once the fish have spawned, the ropes can be removed and both the ropes and the eggs can be immersed in a solution of malachite green at a concentration of 1:300,000. The ropes and eggs are left in this for fifteen minutes and are then removed to a hatching pond or tanks set up for this purpose.

If you wish to select which Koi take part in the spawning, then you will either have to use a spawning net or set up a special spawning pool. If space is limited, then a net is the best method to consider. These nets are made from a soft, very fine mesh and are available in several standard sizes, as well as made to order. They can either be supported by a floating collar of pipework or can be hung from framework above the pool. This latter is probably the better idea as it helps prevent the Koi from jumping out of the trap. Although cover nets can be used, this reduces the light, as well as preventing the Koi jumping out, and as sunlight is one of the stimuli that Koi need to breed, they are not to be recommended, if you can do without them.

A trio in a breeding net. Always use at least two males to a female.

Spawning nets have several advantages. Firstly, the fish are kept in the water they are used to (which also — presumably — has good filtration). Secondly, they are soft, so fish are less likely to damage themselves during the spawning chase. Lastly they make a good, well-filtered tank in which to raise fry.

The alternative to spawning nets, if you do not have a separate pool, is to make a temporary one. Many materials can be used, but one I have employed in the past involves the use of straw bales with a liner laid inside. It is quick and simple to construct and can be removed easily when finished with. Spawning in a separate pool can be the same as using a breeding net. Some people then prefer to remove the parent Koi after spawning, leaving the eggs to develop and hatch in the pool.

Spawning, hatching and rearing

Spawning often begins in the evening with the males following the females around the pool. After a while the female seems to seek refuge in whatever spawning material is available. The vigorous action of the males stimulates the female to release her eggs onto the material and the males release their milt and fertilise the eggs.

Eggs take from three to seven days to develop and hatch, depending upon the temperature. Low temperatures increase hatching time, while higher ones shorten the period. Ideally, 68-71°F (20-22°C) seems to be the best temperature to produce a hatch of healthy fry.

On hatching, fry will attach themselves to the side of the tank or pool and to the spawning material as they seek shelter. At this stage it is important that there is an adequate oxygen supply, as a reduction in dissolved oxygen in the water will cause many losses. Once the egg sac is absorbed (after two to three days) the fry need a good supply of food at all times.

For the first few days when the Koi begin to feed, one of the commercially available liquid fry foods is ideal. Alternatively, hard-boiled egg yolk can be mashed and fed to them. After a week, the fry should be able to take newly-hatched Brine Shrimp and, in another seven or eight days, finely powdered flake foods. The dust remaining in flake tins is ideal. During this time, waste matter on the bottom should be carefully and slowly siphoned off and new, well-aerated water which has stood for several hours added.

GROWTH RATE OF KOI PRODUCED IN JAPAN

Age	Length in cm and inches
30 days old	1.5-1.8 (0.6-0.7)
60 days only	2.4-3.0 (0.9-1.2)
120 days only	6.0-9.0 (2.4-3.5)
150 days old	15.0-18.0 (6.0-7.1)
1 year old	18.0-21.0 (7.1-8.3)
2 years old	27.0-30.0 (10.6-11.8)
3 years old	30.0-36.0 (11.8-14.1)

These figures show the growth that it is possible to achieve, but unless heat is to be used, then we must expect much slower growth rates than shown.

Sexing Koi

So far, I have not mentioned sexing Koi. For those who just want to let their fish spawn in the pond this is not so important, as in any group of Koi there should be at least one female. For people wanting to select the parent fish, it is more difficult.

Sexing Koi can be most accurately done once the fish have been conditioned. Looked at from underneath, females have a very full body shape (see sketch) and, when ripe, are very soft between the pelvic fins and the vent opening. The vent opening on females is also larger and flat.

Males are much slenderer in body shape, almost cigar-shaped when viewed from below. Their vent opening is generally small, oval-shaped and somewhat concave. On the male fish the pectoral fins usually look strong and often have a thick leading edge. Small white spots appear on the leading rays of the pectorals and sometimes on the gill covers of well conditioned fish.

The head of a male Koi also looks large in comparison to its body, while the female seems to have a small head in relation; it is also, usually, more pointed.

Spawning age

Although one-year-old males may prove fertile, two/three-year-old fish would probably be more satisfactory. Females should be at least three/four years old before you attempt to spawn them, while those over the age of ten years are seldom likely to produce a satisfactory spawning.

Generally, female Koi produce about 100,000 eggs for each kilo of body weight. They should spawn only once a year, unless interrupted during a spawning, when they may lay their remaining eggs a few weeks later. One complete spawning should be aimed for with each female.

Males, on the other hand, are able to produce milt almost any time, but a period of 10 to 14 days should be given between spawnings if the males are to be used more than once. The ideal ratio is to use three males to one female.

Variety selection

Most amateurs are interested in trying to produce either Kohaku, Sanke, Showa Sanke or metallics. In the last case, the use of metallic parents of several varieties may well prove beneficial. To produce a large proportion of Kohaku, use only Kohakus as parents. Using Sankes as parents will give a large proportion of Sankes, and using Showas should produce a large number of Showas. But results can, and *do* vary.

To be pretty certain that you will achieve a spawning with a large majority of the variety that you have chosen, you would need to know something of the history of your Koi. Only Koi which have been line-bred for many generations will be assured of producing very large numbers of their own type.

Koi of this type will be very expensive to buy, especially as you really need four fish to obtain the best results.

Weather factor

The final requirement for a successful spawning is the weather. Temperatures in the region of 68°F (20°C) seem to be ideal for spawning, although an increase in temperature of 9°F (5°C) seems to act as a trigger.

If fish have been together for some time without spawning, then a large water change can sometimes act as the necessary stimulant. Apart from the weather being important to induce the Koi to spawn, insufficient good weather is one reason why a female may fail to produce fully developed eggs in time to spawn.

Being successful in *breeding* Koi is not much different to being successful in *keeping* Koi. By paying attention to the health and condition of the parent fish, a spawning should take place most years.

Is the trouble worth it? Anyone who has one of their own hatched and grown Koi in their pond will certainly say 'Yes!'

Spotlight on Koi

WATER — THE KEY TO SUCCESS

David Twigg believes in looking after the water in his pool . . . and leaving the water to look after his Koi.

Water quality is an emotive term, particularly in light of recent privatisation of the Regional Water Authorities. It is however a necessary part of Koi-keeping and demands our utmost attention. It is not my intention to discuss the pros and cons of upflows, downflows, gravel or hair rollers and the myriad other items used in filters because I believe that they will all work, and fairly efficiently at that, if given the correct conditions. It is the end product (the quality of water they produce) which determines their success for the user.

We often hear of pH, ammonia, nitrite and nitrate, along with aerobic bacteria, anaerobic bacteria, media surface area and much other such terminology. But what does it all mean to the average Koi-keeper who probably has limited resources and, almost certainly, limited space? I am not a chemist and know little of the nitrogen cycle, but, in recent years have adopted a 'read, experiment and observe' approach to my hobby which has helped me keep my fish in good health.

Health starts with a STRESS-free existence. It is said that more fish are killed by stress than any disease or parasitic infection, and this may well be true. If so, we must look to the conditions under which our fish live for signs that will tell us if our fish are likely to be in danger. Poor water quality will stress our fish, and we must endeavour to improve it all the time.

In the natural environment of rivers and lakes, fish will move to the best water when that which they are in becomes contaminated, of poor quality or low on food supply. In our garden ponds they rely upon us as their keepers to provide them with the best possible water conditions and a suitable variety of food for their survival.

Oxygen supply

One of the most important of these conditions is the supply of oxygen. Without an adequate supply of oxygen our fish will die. Lack of oxygen in the water is detected by the fish and they become less active. This places them in a stress situation which can lead to health problems, e.g. an opportunist bacterial attack. The quantity of oxygen in water is dependent, to a large extent, upon temperature, and the warmer the water, the less is absorbed before saturation occurs.

The summer of 1989 was an excellent example of the need to provide additional oxygenation in pools. I myself purchased a Hi-Blow air pump which fed three large air stones in the pond and one in each of my filter chambers. The effect on the fish was not only instantly noticeable by way of increased activity, but over the longer term, because their appetite increased they grew faster than my wildest expectations. As an example, a 19in Hariwake put into the pond in January was 23in when checked in October.

It is not only warm thundery weather which depletes the water of oxygen. A habit which Koi-keepers have acquired over the years is that of treating the pond when we have, for instance, a parasitic problem. Even worse, the water is given a prophylactic treatment 'just in case' problems arise.

I was guilty of this practice in my early years as a Koi-keeper before I became aware of what was happening and how it was affecting my fish. Since appreciating that I may do more harm than good to my fish, my pond water has received no treatment. Prevention is better than cure and any fish you add to your pool should be clear of parasites and disease before you put them in and, should treatment be required, the affected fish alone should be treated (not all of them) and then be replaced into the pond.

But I digress . . . the practice of adding chemicals can severely deplete the amount of oxygen in the water and, should it be a necessary step to cure an infestation, please do ensure that you have a good air pump supplying the pond and filter system or your fish may well suffer considerably.

Traditional test kits, used regularly, will put our minds at rest over the pH, ammonium, and nitrite levels and you should give consideration to the purchase of an additional test kit for checking Dissolved Oxygen. This is particularly useful in warmer thundery weather.

Pollutants

There are, however, many other substances which can find their way into our water, play havoc with its quality and can harm our fish, and for these no hobby kits are available. Examples of these are, among others, garden sprays for the plants (insecticides, fungicides, fertilisers etc . . .), and 'creosote" for the fence.

Great care should be exercised when using these products to prevent their contact with the water. Be particularly aware of wind direction when spraying and where the splashes will go if painting, in order to maintain that hard-earned water quality. Even if the chemical itself does not kill, the extra stress that the fish are under while having to live in this contaminated environment may be enough to cause them to succumb to a serious, if not fatal, disease.

Another pollutant of water is food! Uneaten food will sink to the bottom of the pool and decompose. As Koi-keepers will know, 'little and often' is the motto when feeding, and this will not only help prevent the problem of wasted food polluting the water, but save money at the same time.

Filter bacteria

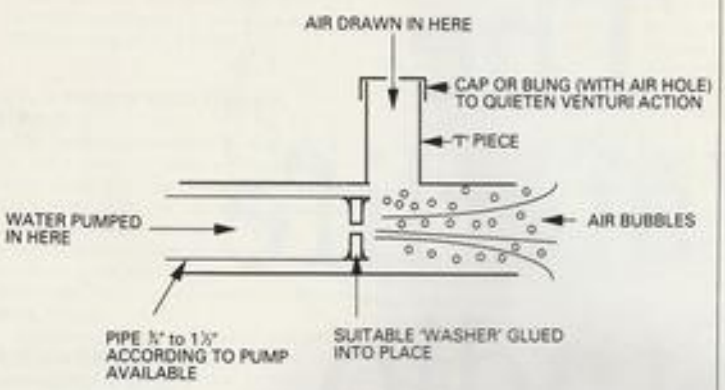
To improve water quality we can employ 'filters'. Filters are required to break down the waste produced by fish, thus producing clean water for the fish to live in. Clean water does not mean 'gin clear' as the saying goes, but *chemically* clean.

The filter system firstly removes the solid matter from the water, generally by settlement, and subsequently, by bacteriological means, converts the liquid waste (dissolved ammonia) into nitrites and then nitrates, the last of which are generally thought to be harmless to fish. There is now, however, some discussion about the long-

DAVID TWIGG

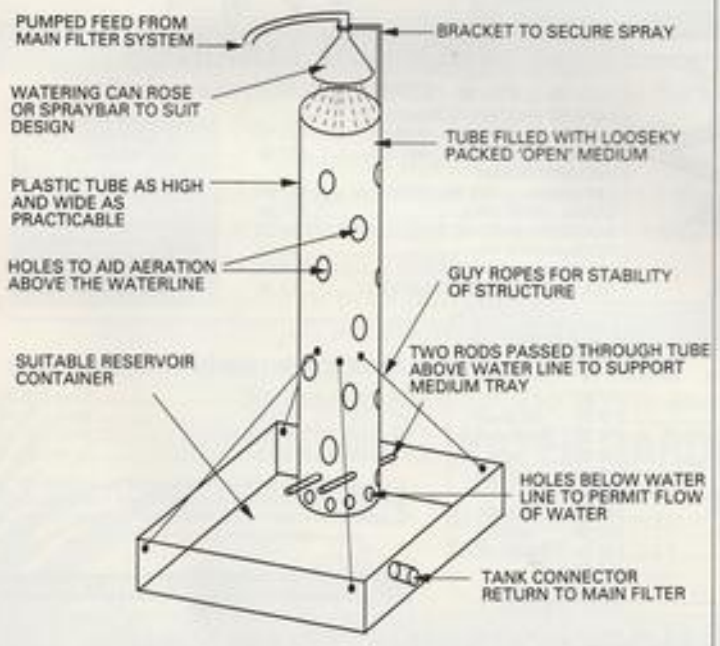
Handfeeding Koi is one of the many pleasures of clean good quality, clear water.

Diagram 1. SIMPLE VENTURI



NOTE
Air hole must be above the water line. An extension tube may be added to give depth of operation. Venturi action will decrease with depth, dependent upon pump used, construction diameter and air tube hole size.

Diagram 2. TRICKLE FILTER



NOTE: Experimentation with the position of take-off from, and return to, main filter system is necessary for best results. The air column does not have to be a tube (I have seen both water tanks and old milk crates stacked one upon the other they work like a dream).

term effects of nitrates which may be contributory to certain diseases.

In the same way that Koi need plenty of oxygen, so do the nitrifying bacteria in the biological part of the filter. It is therefore important to place an air stone under the medium in each chamber. This has a secondary purpose in what may not be a perfect filter chamber in that it will also keep the water moving, thus preventing the development of 'dead spots' where the water can stagnate.

A useful tip in the winter months is to place the air pump in the greenhouse or conservatory so that the air pumped to filter is pre-warmed. Cold air drawn from outside will rapidly cool your water; something which Koi-keepers do not wish to do.

Warm water, oxygen and food are the requirements for keeping a flourishing colony of bacteria in a filter. Regular feeding of similar quantities of food will also produce a fairly stable situation for a filter to deal with.

Large fluctuations in water contamination will cause the filter to become inefficient because the bacteria flourish according to the amount of food available to them. As with depletion of oxygen, so with lack of food — ie they will die. Should demand on them be subsequently increased rapidly, they will not be able to cope and the water will remain polluted to a degree which, in the worst of situations, can lead to death in the pond.

Likewise, a sudden increase in the fish stock in a pond will cause a sudden load with which the filter cannot cope with until the bacterial count has risen and, consequently, in the meantime, water quality deteriorates.

I know that it is difficult sometimes when visiting a dealer to resist those lovely fish which (s)he is offering at 'the right price!'. Remember that if you have 10 fish and you buy one more for your pond you have increased the load on your filter by 10%. The filter will take time to adjust to this extra work and, dependent upon your particular system, time of year (water temperature) and feeding rate, may take several days to re-establish itself.

While this is happening remember that your water quality is below par and is therefore presenting a stressful condition, not only for your new fish (which may have come from entirely different conditions) but for your existing collection as well. It is therefore most important that you monitor the water quality closely for as long as necessary to ensure the wellbeing of your fish.

These days many people are using a cocktail of bacteria in suspension to assist in maintaining the correct bacterial levels in their filter. I feel that these preparations are of most value when first establishing new water in a newly-constructed pool. It is only human nature to want to get one's collection of fish into its new home but, unless one is very careful with the stocking rate, a very unfortunate episode could ensue.

It is my experience that, regardless of pool volume or stocking rate, no more than one fish should be added in any one week. I would modify that to one in two weeks at the height of the summer when oxygen levels in

the water can be fluctuating wildly. At such time it is especially important to keep an eye on the ammonia, pH and nitrite levels and reduce the feeding rate if necessary to allow the filter to regain its balance.

UV, Venturis and Trickle Filters

UV Sterilisers constitute another discussion point when it comes to water quality. Some argue that the water becomes too sterile and therefore the fish lose their natural immunity to disease; others that, given the large volumes of water used in Koi ponds, it is impossible to maintain sterile conditions. From personal experience, I go along with the latter idea.

Sterilisers kill both harmful and useful bacteria, along with free-swimming parasites. The kill performance is dependent upon the rate of flow of water past the ultra violet light which is given off by the fluorescent tubes. The faster the flow, the less the kill, and vice versa. A useful side effect of these devices is their ability to kill and flocculate free-swimming algae, thus clearing water of its green tinge, and allowing good visibility of the fish. This was the primary reason for the purchase of my UV which now runs continuously on my pond.

My water, which had never 'gone green' since it had originally been established, chose to turn 'pea soup' almost overnight in April '89, and, by July, after much soul searching and discussion with dealers and Koi-keepers, I made the decision to buy. Within three days I had all but cleared the water and was again in close contact with my fish. Yet another side effect, due this time, I believe, to the reduction of algae, was that my pH, which had always been on the high side at 8.5 (fish loved it and produced some stunning blacks), fell to 7.5 and has stayed there ever since.

Two simple-to-construct devices to improve water quality are the Venturi and the Trickle Filter.

The venturi provides another, or alternative, method of putting oxygen into water. Reference to Diagram 1 shows that water is pumped through a pipe into which a constriction is placed. After the constriction, air is drawn by venturi action into the pipe and becomes mixed with the water, thus improving the take-up of oxygen.

The venturi discharges below the waterline, and you will see bubbles of air coming to the surface, allowing even greater oxygenation. It will be apparent that in order to get a good take-up of oxygen, the venturi needs to discharge as deep as possible in the pond. This is limited by the pump pushing the water through the constriction, the best usable depth being found by trial and error.

A useful by-product of the venturi is its ability to create a strong current against which Koi love to swim and exercise.

If you haven't got, or can't afford, an air blower, then the trickle filter is for you. A trickle filter uses a small take-off of water from the main flow and allows it to free-fall over an open medium which is above the water line. You may need to use a small pump to raise the head of water for this if you have an 'in ground' or 'gravity fed' system.

The principle is that of exposing small droplets of water to the air so that they may take up oxygen before rejoining the main body of water in the filtration system. Many home brew trickle filters are in use today, and all their owners ('inventors') will sing the praises of this device.

Diagram 2 shows how to construct a simple trickle filter using a length of pipe, watering can rose and hair-rollers (or plastic pan scourers, or cut up pipe or, indeed, anything) which will break up the water as it falls through the tube.

Closing remarks

In the course of this article I have tried to outline some of the many things which effect the water quality in a pond. As you can see they are many and varied, and will have a greater or lesser effect, depending upon your particular pool installation.

There are no hard and fast rules about filtration which will guarantee perfect water quality, but a little time, thought and experimentation given to some of the points raised will undoubtedly improve your water and, hence, the quality of life for your fish . . . given that you haven't achieved the 'perfect pool' already!

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

News from the societies

ASSOCIATION OF MIDLAND GOLDFISH KEEPERS

In 1973 three goldfish enthusiasts, Frank Orme, Tony Roberts and David Easingwood, met together to discuss the possibility of forming a specialist society for goldfish keepers living in the Midlands. At the inaugural meeting held in Coventry in 1974, many enthusiasts turned up in support. At that meeting the Constitution was agreed and the group given the title of Association of Midland Goldfish Keepers.

The society meets five times a year at the Foleshill Community Centre, Coventry, on Sunday afternoons. This year an exciting programme has been planned, kicking off with a visit from that well known authority on fish care, Dr David Ford on **March 18.**

The rest of the season is as follows ;

13 May: Adult Fish Show and video taken at the 1989 Ichiban Ranchu Show, Tokyo; **24 June:** Annual Show; **23 Sept:** Baby Fish Show and Prettiest Fish Competition (Non-standard); Slide show; **11 Nov:** Annual General Meeting with mulled wine and mince pies!!

The meetings are run on a relaxed and friendly basis, and novice fishkeepers are encouraged to discuss any problems that they may have encountered in keeping and breeding fish. There is also the opportunity to buy healthy, quality fish at the auctions held through the year.

Interested in more information? Write to: Mrs Karen Thompson, 34 Ninth Avenue, Grantham, Lincs NG31 9TF.

TO ALL SHOW SECRETARIES

The *Aquarist & Pondkeeper* **Gold Pin** is available free for presentation to the winner of **"Best Fish"** to any Society holding an Open Show.

However, the award must be applied for in writing and should *not* be included with other correspondence such as details intended for publication in our Diary Dates section as these are dealt with by a totally different department.

We would also like to point out that this award is given on the understanding that each Club will assist us by doing everything possible to encourage winners to enter their fish in the CHAMPION OF CHAMPIONS contest, sponsored by the magazine and held each year in Manchester in conjunction with the BRITISH AQUARISTS FESTIVAL.

Diary dates

Catfish Association of Great Britain (Northern Area Group)

Wigan Pier is, once again, the venue for the CAGB (Northern Area Group) Convention. This year's event will be held on **1 April** at the Mill Exhibition Centre on Wigan Pier.

Guest speakers: **Bill Tomey** — biologist, tropical fish adviser to the CBI (Netherlands) and the United Nations ITC — will be talking on **Tropical Fish and Their Environment; Dr. David Ford** — Head of the 'Aquarian' Advisory Service — will concentrate on **Aquariums of the World.**

There will also be trade stands, a display of rare and unusual catfishes, information stands with a range of experts on hand to help with aquatic queries, and an auction of rare catfish, to make the day a very full and enjoyable one.

The committee hope there will be at least as many people attending the Convention as there were last year (400) when the speakers were **Heiko Bleher and** *A & P* editor **John Dawes.**

The sponsors for this year's event are, once more, **Pier Aquatics** and **Interpet.**

For an information pack and tickets, send an S.A.E. to J. T. Morris, 102 Cale Lane, Wigan, WN2 1HB. Tel Wigan 42386.

Australia New Guinea Fishes Association

The above Association will be holding its 1990 National conference on **Saturday 24 and Sunday 25 March** at the Mt Coot-tha Botanic Gardens Auditorium in Brisbane, Queensland, Australia.

Conference speakers include: **Heiko Bleher** (Aquarium Rio, West Germany); **Chris Barlow** (Old Department of Primary Industries); **Rick Datodi** (Pet & Aquarium Industries, Melbourne); **Dr Walter Ivantsoff** (Macquarie University); **Rolly McKay** (Queensland Museum); **Gilbert Maebe** (Aquarist, Belgium); **Mike Pearce** (Dept of Primary Industries, Northern Territory); **Guntha Schmida** (Aquatic Photographer); **Jasper Trendall** (Aquaculture Consultant); **Dr Angela Arthington** (Griffith University); **Bradley J Pusey** (Griffith University).

Among the topics to be discussed will be:— Northern Australian Commercial Aquatic Species; The Influence of Past Geological Events on the Distribution of Present Day Freshwater Fishes of Australia; Epizootic Ulcerative Syndrome; The Future of Australian Freshwater Fishes; Preservation of the Lake Eacham Rainbow; Water Quality and Diseases; Australian Fishes: A Photographer's Perspective; Colour varieties of *Rhadinocentrus ornatus;* Fish Communities of South West Australia.

Registration Fee: Single day — $40.00; Both days — $70.00. The registration fee includes: lectures, lunches, morning and afternoon teas, information satchel, writing and note-taking materials, admission to the fish and plant auction.

For more details, contact: Gary Parker, 84 Bennetts Road, Camp Hill, Queensland, Australia 4152. Tel. (Business Hours): 07-395 2955. After Hours, contact Greg Ure:— 07 341 4239.

Anabantoid Association of Great Britain

The annual Anabantoid Association Members' Weekend will be held this year on the weekend of **7 and 8 April** at Sorby Hall, Endcliffe Vale Road, Sheffield University.

On the Saturday, there will be three lectures including unique information on Snakeheads and Bettas from Malaysia and Sarawak. For the first time, these will be open to non-members at a fee of £2.50, refundable if visitors join the Association. Other events that day include the Closed Show on 19 classes of anabantoids.

On the Sunday morning the events include a further slide show, AGM and Prizegiving, while after lunch, there will be the members'-only auction.

Further details from:— Chris Clark, 19 Alder Grove, Balby, Doncaster DN4 8RF.

Rothwell & Wakefield Aquarist Society

Rothwell & Wakefield A.S. are holding their 7th Open Show and Auction on **Sunday 11 March** at Blackburn Hall, Marsh Street, Rothwell, near Leeds. Full details from Kevin Swinson, Secretary, R. & W.A.S., 56 Park Avenue, Allerton Bywater, Castleford, West Yorks, WF10 2AS. Tel 0977 511464.

Bournemouth Aquarists Society
The annual Open Show of the B.A.S. will be held on **Sunday 13 May** at Kinson Community Centre, Kinson, Bournemouth. Schedules for the above show will be available after **1 April.** Details from the Show Secretary, Jack Jeffery, 8 Hatfield Gardens, Bournemouth, Dorset BH7 7HE.

Scottish Aquarist Festival
The new dates for the 1990 Scottish Aquarist Festival are **Saturday 1 and Sunday 2 September.** The new venue remains the same, i.e. the Civic Centre in Motherwell.

For further details contact: John Wells, S.A.F. Advertising Co-ordinator, 57 Ramsey Place, Rosyth, Fife KY11 2YG. Tel 0383 415820.

Merseyside Aquarist Society
The 1990 M.A.S. annual Open Show will be held on **Sunday 29 April** at the Rainhill Village Hall, Dane Court, Rainhill, Prescot, Merseyside. Further information from the Secretary, J Bailey, 11 Auburn Road, Liverpool L13 8BJ. Tel 051 228 8199.

Skegness & District Aquarist Society
The 1990 S.D.A.S. show will be held on **18 March.** Venue: Richmond Hotel, Richmond Drive, Skegness. Judging will be to Y.A.A.S. Standards with 3 A-class Judges, plus up to 3 B-class Judges officiating. Benching 12 noon-1.45 pm. Side stalls and refreshments will also be available. For further details contact H Drawwater, Tudor Lodge, 72 Station Road, Burgh-le-Marsh, Skegness, PE24 5EP.

Greenock & District Aquarist Society.
The G & DAS Open show will be held on **Sunday 18 March** at the James Watt College, Finnart Street, Greenock. Further details from James Sheekey on 0474 43591.

NATIONAL SHOWS

17 & 18 March
NISHIKIGOI '90
County Show Ground, Bingley Hall, Staffordshire. Further details from Pete Waddington. Tel 0942 724896.

31 March, 1 April
YORKSHIRE AQUARIST FESTIVAL
Doncaster Racecourse. Further details from Marie L Harrop. Tel 0484 666591.

2 & 3 June
AQUARIA AND WATER-GARDENS '90
National Exhibition Centre, Birmingham. Further details from Andrew Waller, 32 Hamilton Road, Heath Park, Romford, Essex RM2 5SD. Tel 04024 59982.

23 & 24 June
SANDOWN PARK EXHIBITION
Sandown Park Racecourse. For further details ring 0256 29998.

11 & 12 August
BRITISH KOI KEEPERS SHOW
Billing Aquadrome, Northampton. For further details contact John Beattie. Tel 0604 416316.

1 & 2 September
SCOTTISH AQUARISTS FESTIVAL
Civic Centre, Motherwell. Further details from Bill Bennett, 15 Coulter Avenue, Coltness, Wishaw, Lanarkshire ML2 8SZ.

27 & 28 October
BRITISH AQUARISTS FESTIVAL.
Bowlers Exhibition Centre, Manchester. Further details from Arnold Chadwick, 9 Bronville Close, Chadderton, Oldham OL1 2RH. Tel 061 6526207.

10 & 11 November
SUPREME CHAMPIONSHIP OF FISHKEEPING
Pontins Holiday Centre, Sand Bay, Weston Super Mare. Further details from Mike Clarke, Interpet, Vincent Lane, Dorking, Surrey RH4 3YX. Tel (Daytime) 0306 881033.

MEXICO

THE LIVEBEARER TRAIL – PART 1

Derek Lambert, of Viviparous — Livebearer Information Service, recalls the recent expedition he and his mother, Pat, made into livebearer country.

(Photographs by the author)

Top left, sunrise over Lake Catemaco — an unforgettable sight.

Above left, *Poeciliopsis catemaco* was just one of several species we caught in the lake.

Top right, Rio Michol — a rich source of livebearers.

Above, this probably new, *Poeciliopsis* was collected in the Rio Girasol.

Far left, at Rio Calcaluta all the children joined in the fishing, with little success but much enjoyment.

Left, the *Poecilia butleri* from Rio Calcaluta are particularly colourful.

Click! That was the sound the fish house door made as I closed it for the last time on that cold November morning. As usual, the thought that I might return to a hundred tanks of dead fish ran through my mind. I had done the best I could for them by asking my next door neighbour to check the heating was working in both fish houses each day and extracting the promise that, under no circumstances, were the fish to be fed while I was away (more fish have been killed by kindly neighbours over-feeding than by starvation).

We left home at 11 am on 23 November and arrived in Mexico City 19 hours later. The next day we collected our car and drove to Cholula which is near Puebla. Our guide book said this was only a two-hour drive but, with the slow-moving lorries and the poor condition of many of the roads, it took us nearly four hours.

It was 8.30 am when we started out for Catemaco Lake and, taking only one 15-minute break, we arrived at 6 pm just as darkness was descending. With two drivers such a trip would have been arduous, but with only one (my mother, Pat), it was clear we had been over-ambitious in our plans. So we decided to stay for two nights at Catemaco to get over jet-lag and general exhaustion.

Our hotel room looked out over the lake and, as the sun rose above the mountains, we realised we were standing in one of the most beautiful places on earth. If I were a poet I might be able to capture some of the essence of that moment . . . but I'm not!

First collections

At an altitude of 1,212ft Lake Catemaco has a very pleasant climate, with mid-day temperatures reaching about 85°F (c 29°C) during the winter. The lake is 10 miles long and has an area of 50 sq miles.

We fished at numerous lakeside locations and in small feeder streams. We caught Two-spot Livebearers *(Pseudoxiphophorus bimaculatus)* and Swordtails *(Xiphophorus helleri)* in their thousands. These are what I call 'weed' fish. They are the common species which it would be difficult not to catch when fishing Catemaco Lake.

We also caught some youngsters of *Xiphophorus milleri*. This platy is one of three species of livebearers which have evolved in this lake, the other two being *Poecilia catemaconis* and *Poeciliopsis catemaco*. It wasn't until our third location that some young of *Poecilia catemaconis* made their way into our nets.

We were particularly interested in finding some *Poeciliopsis catemaco* as this species has never been established in captivity. Females grow to 5in (12.7cm) and are used as food fish; indeed many specimens used to describe the species were bought in the local markets.

Before we left the hotel that first morning I had taken a stroll along the waterfront to see if I could spot any fish close to the shore. While only a few could be seen by the concrete jetty, whole shoals of them were parading up and down the shoreline.

That evening I went out with nets and containers to take a closer look at these fish, but they had vanished with the early morning mist. Early next morning I returned to see who these mysterious early morning callers were. One swish of the net turned up three *Poeciliopsis catemaco*. It looks like a case of the early aquarist catching the fish!

Now we could head for Palenque in the foothills of Chiapas. The Mayan site of Palenque is about 1,500 years old and, at its peak, was a city estimated to cover 25 sq miles. At an altitude of only 200ft the climate is both hot and humid, with frequent downpours of rain in the late afternoon. Today, the town sits on the edge of a tropical rainforest which stretches all the way to the Amazon and beyond. Our hotel room looked over the forest and the screeching parrots, hooting monkeys and chirruping insects all combined to produce a deafening cacophony of sound.

We spent two days here fishing a number of rivers in the area. The most important location was the Rio Michol. At the point we fished it, the river was only some 12ft wide and about 4ft deep (3.6 x 1.2m). The substrate was gravel, covered with mud, and there was plenty of plant growth, both in the

water and at the edges.

Here we caught Two-spot Livebearers (*Pseudoxiphophorus bimaculatus*), Piketop Livebearers (*Belonesox belizanus*), *Priapella compressa*, Swordtails (*Xiphophorus helleri*), Green Mollies (*Poecilia sphenops*), characins and cichlids.

While all these fish were very interesting, none were what we had really come to find. The genus *Heterophallus* has only three species in it at present. Of these, *Heterophallus milleri* and *Heterophallus rachovi* are both in the hobby, but *Heterophallus echeagarayi* is not. This species is known only from the Río Michol and I had hoped that we might have been able to find some.

Elusive river

From Palenque we decided to drive to Teapa and stay two nights so that we could try to find the Blind Cave Molly which comes from a cave in this area. We arrived at Teapa in a thunderstorm and a quick look around town showed us a change in plans was in order. What a dump!

In a mad moment we decided to carry on to San Cristobal de Las Casas. Every guide book on Mexico says "Don't drive at night". Well we did — for two hours through mountain passes and in thick fog. Pat said afterwards how much she had enjoyed it!!

Comitan, near the Guatamalan border, was our next port of call. A new road which has been built along the border, has opened up a number of rivers which hitherto have been inaccessible to fish collectors. Some of these rivers are thought to contain populations of *Xenodexia ctenolepis*, although, owing to this area's isolation, little is really known for sure. We left the hotel at 7.30 am and headed for the Lagunas de Montebello.

This is a National Park which contains many lakes, each of a different colour. Passing through this we continued along a dirt road through high mountains and deep ravines covered with dense tropical rainforest. Four hours and one village later, we had still not reached the first river on our map. We were running out of time, when we turned a corner and came to one of the most beautiful rivers I have ever seen. The Río Santo Domingo is a tributary of the Río Lacantum and, while we only caught some characins here, it will always remain in my mind as typifying the natural splendour of this region.

On the return journey to Comitan we fished a number of small rivers including the Río Girasol. This is a small river only some 6-10ft (1.8-3m) wide, with a muddy substrate and plenty of growing plants. All in all, an ideal habitat for livebearers. The water was hard, alkaline and a muddy brown colour. We collected a *Poeciliopsis* species here, which, although I am familiar with the 20 or so described, didn't seem to match up with any of them.

Moving on from Comitan to the Pacific coast we finished from Huixtla to Tonala in search of *Brachyrhaphis hartwegi*. While I already have this species from Guatemala, I wanted to collect some from Mexico for comparison. The Río Calcaluta proved to be the most interesting of these habitats, yielding many characins, some stunning *Poecilia butleri* and the very attractive *Poeciliopsis turrubarensis*.

This river was wide and fast-flowing, although not particularly deep, and had a rocky bottom with gravel beaches. It was Sunday afternoon and several Mexican families were out enjoying themselves, swimming in the river. Soon all the children were splashing around trying to help me catch the fish. While not very successful, they all seemed to have great fun!

Military intervention

Continuing north along the coast we passed through Huatulco, Acapulco and Playa Azul — four days solid driving during which we were stopped by the army six times, looking for guns and explosives. On the third day along this coast we found out why they were searching so carefully for such things.

The car broke down and we were stranded 60km outside Acapulco. Within five minutes a bus driver had stopped to help. When it became dark he decided to tow our little Volkswagen Beetle into the nearest village. However, just before we set off, an open-topped truck pulled up. In the back were three Mexicans with machine guns! Fortunately, it turned out they were local vigilantes guarding this stretch of road against bandits. Even when the car was repaired, our bus driver friend refused to leave us, and we drove in convoy all the way to Acapulco. We arrived in the middle of the night, exhausted but very grateful to be still alive.

Our final habitat along this coast was some canals near the Guerrero/Michoacán border. These are the habitat of *Poeciliopsis scarlli* which is a small colourless species nicknamed The Flier due to its large pectoral fins. While it is true that this species has large pectoral fins, they are no larger than many other species of *Poeciliopsis*. The unique blue eye rings are a definitive characteristic, perhaps more so than the pectorals. In any case, we didn't find any specimens, unfortunately.

From Playa Azul we turned inland towards the highlands of Michoacán and the heart of Goodeid territory. By now we were into our last week and heading for what, to us, would be our most important habitats.

The following is a table of the results obtained from water tests carried out at the more important locations so far mentioned:

Habitat	pH	GH	KH
Catemaco	8.0	3.5	3.5
Río Michol	7.7	10.0	8.0
Río Girasol	7.7	17.5	14.0
Río Calcaluta	6.8	2.0	0

For further details of Viviparous — Livebearer Information Service, contact **Nigel Hunter, Public Relations Officer, 60 Barry Way, Brighton Hill, Basingstoke, Hants. Tel: 0256 471568.**

In Part 2, Derek and Pat Lambert launch their attack on Goodeid country. Don't miss it!

Books

Adults of the British Aquatic Hemiptera Heteroptera

(A Key with Ecological Notes)

By: A A Savage

Published by: **Freshwater Biological Association (Scientific Publication, No 50)**

ISBN: 0 900 386 487

Price: £10.00

Water Bugs **(Heteroptera)** are familiar organisms to anyone who either has a pond or has taken the time to peer into a body of (mainly) standing water such as a dew pond, ditch, *Daphnia* pond, or the like.

Water Boatmen are, perhaps, the best-known of all the "bugs", but Water Skaters and Water Scorpions are two other types commonly encountered.

Not that you would know that from consulting this impressive book, which almost seems to have set out consciously to avoid common names (with the exception of several references to Water Bugs) as if they were "unclean".

Personally, as a biologist myself, I'm all in favour of using scientific names, particularly in works of this type where they are absolutely essential, but common names — despite their weaknesses — do have an important role to play, even in academic circles. Certainly, the inclusion of, at least, *some* in **Hemiptera Heteroptera** would have made life easier for a lot of people, including all those who belong to the growing body of aquarists and pondkeepers who want to know more about matters aquatic than just how to keep their fish and plants alive.

That aside, **Hemiptera Heteroptera** is probably the best and most comprehensive guide to the 70 or so species and sub-species of Water Bugs of the British Isles. There is also quite an extensive ecological section which covers a wide range of topics including life cycles, behaviour, distribution, feeding, predators, parasitism, migration and other vital areas of study.

For the student, this book is an absolute must; for the aquarist and/or pondkeeper interested in these fascinating insects, **Hemiptera Heteroptera** could also prove very useful ... provided (s)he has a biological dictionary and a list of common names close at hand.

John Dawes

GOING DUTCH

Part 2: The Limburg, Noord-Holland and 'Open' Concepts

Arie de Graaf continues his short series on how to set up aquaria the Dutch way.

(Illustrations by the author)

First STEPS

In my first article I gave an example of an aquarium set up according to the Leiden School, characterised by slow-growing plants like Cryptocorynes and the Leiden Plant or Lizard's Tail (*Saururus cernuus*), plus the use of extensive terracing.

Nowadays, Dutch aquaria tend to include faster-growing plants, limited terracing and (often) a greater emphasis on 'depth effects' through the construction of broad tanks (as in C. van Schaijk's aquarium). In addition, some have open tops (see J. J. van Lieshout's aquarium), while others have cover glasses which permit light to come up from the tank onto the wall behind (see Henk de Groot's aquarium).

The Limburg Concept

If you are looking at an aquarium in the Netherlands, you can see from which part of the country the owner of the aquarium originates. For example, in the Dutch county of Limburg, it is often the case that an aquarium is broader than high. In fact, an aquarium of 90cm (36in) is not unusual there.

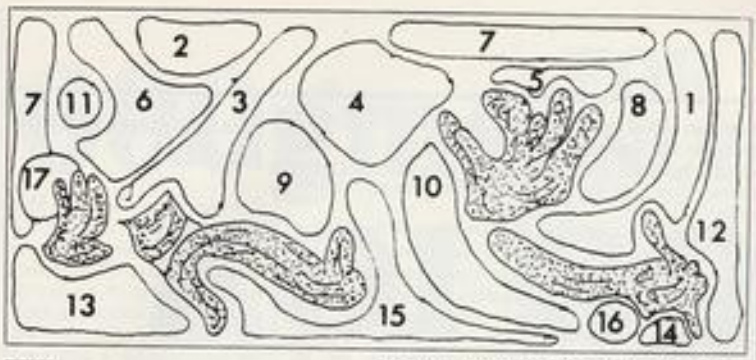
Such aquaria are often built partly into a wall with, for example, half of the aquarium in the living room and the other half in the kitchen. The length of such aquaria sometimes exceeds 1.5m (c 5ft).

An example of such an aquarium from Limburg (with a larger width than height) is shown in the accompanying photograph. It is the proud possession of C. van Schaijk

Ammania senegalensis **(brown),** ***Hottonia inflata*** **— Tropical Water Violet — (bright green) and** ***Cryptocoryne beckettii*** **(foreground) form a most attractive and contrasting arrangement in Henk de Groot's aquarium.**

J. J. van Lieshout's open-top pentagonal aquarium exploits its potential to the full (see text for details).

Cardamine lyrata **(Japanese Cress) brings a splash of bright green to its contrasting surroundings — a frequent feature of Noord-Holland aquaria.**



= Bogwood

Plan view of C. van Schaijk's Limburg-type aquarium (see boxes for details of plants and fish).

from Voerendaal. This aquarium measures 150x65x55cm (c 5ftx25x22in). The proportionally broad frame harmonises with the layout of the living room, while the overall effect of the aquarium radiates calm.

The walls are covered with cork slices and the terraces incorporate some elegant wooden roots (bogwood). The 'architecture' of the plants, in combination with the wooden root, create a beautiful depth effect.

The choice of fish is such that the bottom, middle and the upper layers are all inhabited by appropriate species. The number of fishes is, of course, limited.

The water is filtered over a biological filter bed by an Eheim 1030.

The lighting consists of:— 1 fluorescent tube 58 (colour 72, Osram), 1 fluorescent tube 65 (colour 57, Philips) and 3 fluorescent tubes 65 (colour 32, Philips).

These lights are controlled by five time switches (one for each tube). The rising and setting of the sun is simulated electrically with four 'glow-lamps' (low wattage bulbs).

The Noord-Holland Concept

The Noord (North)-Holland approach, like the Limburg one, pays great attention to overall external design. It does, however, have its own characteristics.

For instance, the aquaria are often 'hung' on walls by means of strong brackets. Then the top is not 'solid' but, rather, has a cover glass which allows light to come up from the tank to illuminate the wall of the room.

Like their Limburg counterparts, Noord-Holland aquaria can be very long. The accompanying photograph shows an excellent example of such a set-up, owned by Henk de Groot from Alkmaar.

PLANT SELECTION

1 *Ammania gracilis*
2 *Cryptocoryne crispatula* Engler
3 *Hygrophila difformis*
4 *Limnophila aquatica* (Roxb.) Alst.
5 *Vallisneria asiatica* Miki
6 *Hygrophila stricta*
7 *Microsorum pteropus* (Bl.) China
8 *Bacopa monnieri* (L.) Hettst.
9 *Alternanthera reineckii* Brid.
10 *Lobelia cardinalis* L.
11 *Rotala rotundifolia* (D. Don) Koehne
12 *Najas pectinata* (Parl.) Magn.
13 *Anubias barteri* var. *nana* (Engler) Crusio
14 *Cryptocoryne beckettii* Thw. ex Trimen
15 *Echinodorus tenellus* (Mart.) Fassett
16 *Glyceria* spec.
17 *Myriophyllum brasiliense* Cambess.

The 'Open' Concept

This idea is German in origin and is very popular in its home country.

The example shown is of a very tasteful pentagonal open aquarium owned by J. J. van Lieshout from Deventer. It represents a successful compromise between a normal aquarium and a triangular one. The drawback of a triangular aquarium is that it is, per definition, symmetric. By creating a pentagonal aquarium we have the spatial advantages of the triangular aquarium while, at the same time, making the tank more asymmetric.

A very good example of a Limburg-type aquarium (the same one shown in plan view in the accompanying photograph).

One of the disadvantages of an open aquarium is that the edges of the glasses are always visible. The solution adopted in this case is excellent. A narrow lightshade with fluorescent lamps has been constructed around the glass-margins, hiding the edges, providing illumination, and still maintaining an open design.

In this aquarium there is unity between the flora under and above water level, with a piece of wooden root (bogwood) projecting through the surface, topped by a Bromeliad.

This sense of continuity is extended to the faunal component as exemplified by a Four-eyed Fish (*Anableps anableps*) just detectable below the Bromeliad. The only other fish in this aquarium are Discus (*Symphysodon*).

Henk de Groot's spectacular Noord-Holland aquarium.

FISH SELECTION

Aplocheilus lineatus (Cuvier & Valenciennes, 1846)
Paracheirodon axelrodi Schultz
Noemacheilus botius (Hamilton-Buchanan, 1822)
Barbus tetrazona (Bleeker, 1855)
Labeo erythrurus Fowler
Poecila sp

Closing remarks

All three types of aquaria mentioned in this article are quite popular in the Netherlands. Taken together with the Leiden-type concept described in Part 1 (February, 1990), they represent a reasonable picture of what is meant by the term 'The Dutch Aquarium'.

Letters

South Inch A.S. Open Show Success

Our Open Show was a huge success for us in many different ways, especially considering the time allocated for it: just three hours. Despite this limitation, we still managed to pull it off and were paid handsome tributes by both Lord Provost Murray and George (Geordie) Kane from Kirkcaldy A.S. The former said that he equated the Best in Show (a headstander) with those who said it could not be done! The latter praised us because we had won the ultimate prize in many aquarists' eyes — The best Breeders with *X. macalana*, an award that every member of South Inch is extremely proud of!

South Inch member with Lord Provost Alex Murray admiring some of the entries at the Open Show.

At the outset, we hoped to run the Show along conventional lines, with 50-odd classes, raffles and a tombola, but owing to the time restrictions, we had to make do with 22 classes, no raffle or tombola. We did, however, have a Charity Fish Auction and raised £108 for the local radio's 'Caring for Kids'. Thanks to everyone for contributing.

We also had to restrict the numbers of visiting club members to two per club. I must relate the story of Birtley A.S. where it seems that so many of their members wished to attend our show that the only way they could resolve the situation was to draw names from a hat. I have always known that the English were a bit strange, but who else would pick names from a hat for a day in Prison?!!

Now to the Show proper. When the day came along, it was typical Scottish weather — dull, cold, and raining. I thought: "Oh well, that will put some of them off coming". How wrong I was. No sooner were we in the Visit Room, where the show was being held, than entries started coming in thick and fast. Soon, Dave on the computer, was busy logging entries on his Micro. This proved to be a real boon to us, for at the touch of a button, all the information required was either on the screen or being printed. We found this saved a great deal of time when benching entries, with no long queues forming . . . and no frayed tempers either. The computer was loaned to us by the Education Unit in the Prison — thanks Brian.

The Show was a completely new experience to most of the South Inch A.S. I, myself, had cut my teeth in Shows with Edinburgh Pondkeepers and Livingston back in the early 80's. We were lucky, though, as I was able to 'Press Gang' some willing helpers, namely Rodger who didn't Dodge, Joe Broon, Peter Symington and, not forgetting our main sponsor, Walter Renton, all well-known faces on the Scottish Club scene.

In no time at all, it seemed George Kane and his team of judges had completed their Herculean task of judging the 220 entries, and the results were out.

How well had we done? Very well as it turned out!

I must pass comment about the quality of the fish on the bench — it was excellent . . . and so many entries too. What a buzz of excitement we all experienced as we gazed at the array of tanks set out in their respective classes and the judges going about their business in their usual unperturbable manner. Then our gaze shifted towards the refreshments area. It was hard to distinguish South Inch members from the general public — it was just like any other Show in a Church Hall or Institute, not a Visit Room of a Maximum Security Prison!

All too soon, it was over: fish were de-benched, goodbyes were said, promises of return visits to give talks were made, new friendships struck, old ones renewed and cemented, a feeling that we had all participated in something really worthwhile and special, of a job well done, and of, course, thoughts of next year. Would it be an all-day affair, with more classes and more entries, plus the opportunity to meet and talk with fellow aquarists? I can say that the Governor, Mr. Kite, made some comments that, yes, it would be bigger and better.

In conclusion, I would like to thank Mr. Kite for allowing us to put on the Show and for encouraging us. Many thanks also to Derek Pirrie, our Assistant Governor, who, as a PR man, has a great future after being thrown in at the deep end and doing such a great job for us! I would also like to say thanks to all the people who travelled far to exhibit their fish and so help make the Show such a success. Last, but not least, all the South Inch members: Jimmy, John, John, John, Danny, Paul, Dickie, Colin, John (again), Ben and Tank!

Best in Show (*A&P* Gold Pin): G. Talbot — Forfar A.S. — *C. punctatus*.

Highest Pointed Club: Kirkcaldy.

Bruce Budge
Chairman — South Inch A.S.

Pixies and frozen ponds

It is very many years since I had contact with *Aquarist & Pondkeeper*, under the name of Singleton Bros (Electronics) Ltd. I retired in 1974 when the Company was sold out to Armitage Brothers Ltd. At that time we were making a very small aquarium air pump called the 'Pixie' (now discontinued) which had won the Design Centre award.

The main reason for writing to you concerns the fact that, at this time of the year, pondkeepers are still concerned about their ponds freezing over, and I wonder if it is widely known that a small air pump will clear a small circle of the pond surface *and* keep it clear when the air temperature drops quite a few degrees below freezing.

The advantage of using a stream of air to keep a small area of a pond unfrozen, rather than using a floating immersion heater, is, firstly, a considerable saving in the cost of electricity. Small air pumps consume about 4 watts per hour, whereas I imagine that floating heaters are designed to consume about 60 to 100 watts per hour. The 'Pixie' consumed only 2½ watts per hour and would therefore run for 400 hours, or nearly 2½ weeks, on one unit.

In the north of England it is possible that the much lower temperatures experienced there might well cause a pond to freeze over even though an air pump is being used, but even though this might happen, the pump would still supply clean air to the water below the ice and thus dispel or dilute any gases which might form under the ice.

Incidentally, when suggesting this method of using an air pump for aerating a pond, I always advise that the pump should be as close to the pond as possible, as a long air line will reduce the flow of air. Also, the air stone should not be deeper in the water than about 15in (38cm).

S A Singleton,
Falmouth,
Cornwall.

OUT AND ABOUT

ULSTER'S FOUNDATION FATHERS OF TROPICAL FISHKEEPING

By Billy Whiteside, B.A., A.C.P.
(Photographs by the author)

Laurie Morris in his shop, Ulster Aquatics, in Belfast's Hope Street.

MY first fish were sticklebacks caught in a local river, and goldfish bought in a local pet shop in the late 1940s. I kept them in large glass jars given to me by my grandfather, who had them in his grocery shop. Soon afterwards, I saw a tropical aquarium in a home my parents visited and, from that moment on, I just had to get a tropical aquarium. The only tropical aquarium shop in Northern Ireland at that time had been recently opened by three Englishmen, in Belfast, in 1947. It was known as Ulster Aquatics and was situated in Beersbridge Road, Belfast, not too far from the shipyards.

It took me a little time to persuade my father to take me to the retail shop and, hence, to the wholesale outlet, at Orangefield House, to buy my first aquarium. It had a beautiful, rounded, aluminium frame and was 18 x 10 x 10in in size. Not too long afterwards I persuaded my father to buy me a second tank, with the same aluminium frame, only the second one was 20 x 12 x 10in. They were beautiful pieces of engineering and indeed, over 40 years later, they are still in daily use in my home.

A heater, lid, light, thermostat, thermometer and some gravel were added to my first tank, together with some pieces of flint rocks from the seashore. Aquatic plants were added and the tank filled with water. Soon I was back at Ulster Aquatics ready for my first tropical fishes. I can recall my father lifting me up to enable me to see into the higher tanks; and I can still recall my wonder when the proprietor of the shop siphoned some water into my glass jar, for the fish. I had never seen a siphon work before and was quite convinced that he had some special sort of magic tube that he used to keep the water flowing from tank down into jar! My next purchase was a Proctor or a Scot air pump. It had a wooden case and was noisy and loud.

With the dawn of 1990 I realised that I had been a tropical fishkeeper in the 1940s, '50s, '60s, '70s, '80s and now, '90s. My two favourite aquarium shops in Northern Ireland are **Ulster Aquatics**, still owned and operated by **Laurie Morris**, now aged 74; and **Grosvenor Tropicals**, owned and operated by **Alfred Robbins**. Although I had frequented both gentlemen's shops for decades, I had never discussed the beginnings of the hobby in Ulster with either; so I decided to load my camera with film and make a 50-mile round-trip to Belfast to get the facts from the gentlemen who know.

Laurie Morris and his daughter **Eleanor** were working away in their shop, in Belfast's Hope Street, when I arrived. It took only a couple of minutes' chat with Laurie for me to be transported back to my childhood days — and I learned lots of things that I had never before heard from the quietly-spoken Englishman who does not appear to have lost any of his native accent during all his years in Ulster.

I learned that Laurie Morris, together with friends **Charlie Ford** and **Alex Graves**, had come to Ulster on leaving the army after the war. Charlie and Alex were welders. Alex and Laurie had a car auction business that wasn't going too well.

Charlie Ford was a bird man and he started the business of making aquarium frames from tubular aluminium. They were quite complicated to make but had the great advantage over angle-iron that they did not rust. The aluminium was stove-enamelled after manufacture, and the tanks were so good they almost sold themselves. Soon the three friends were developing the business and the fish side. There were no cargo containers for transport in those days, so they had to pack their aquariums in a van and transport them thus across to England. They took them to

Continued on page 84

Moorish Idol and Yellow Tang at Grosvenor Tropicals.

Staff of Grosvenor Tropicals in Beersbridge Road, Belfast. Left to right: Desi Bryans (plant expert), Rena Robbins (Alf's wife), Kyle Bingham, Eileen Hughes and proprietor, Alf Robbins.

PRODUCT ROUND-UP

BY DICK MILLS

PRODUCT PROFILE:

HEATERS/THERMOSTATS

I have made a 1990 New Year's Resolution. Such has been the improvement in design of single-energy (electricity) heating equipment that, in any future articles that I may write about aquarium heating, I will curb the tendency to mention the so-called good old days when slate-bedded aquariums were heated by oil- or gas-fed lamps; so I won't. Nowadays, aquarium heating is taken much for granted — just fit a plug and away you go.

However, there are still a few variations on this common theme that may need explaining to newcomers. Aquarium heating can be divided into two types — **internal** and **external** — with the proportion very much balanced in favour of the internal system. This is not too surprising since the operation is far more flexible and involves far less 'hassle' in event of breakdowns.

Most aquarists use internal combined heater/thermostat units, selected to match the size of their tanks (using two units on large tanks not only ensures even, and rapid, spread of heat but also, in the event of one unit failing, the other acts as a temporary safety measure until a replacement can be effected). The actual construction of heaters may vary from brand to brand, but are all essentially miniature immersion heaters consisting of a heating element or coil encased in a watertight tube. This coil is usually mounted on a ceramic former, but a further refinement may be to fill the glass/aluminium/polycarbonate tube with sand to disperse the heat more evenly. In order to maintain the water at the desired temperature, some kind of control must be used: thermostatic control simply switches the heater off at a pre-set temperature (usually factory-set at 24°C - 75°F), and on again when the water cools by a few degrees.

Most thermostats work on the bi-metallic strip principle. The 'strip' can be seen at the bottom of this unit (it has a hole).

The simplest type of thermostat contains a bi-metallic strip which bends under the influence of temperature changes, and so effect the necessary switching action. More recent designs use circuitry similar to that used in lamp-dimming devices and, if there is a neon indicating lamp on the unit, it may 'pulse' frequently as the temperature approaches the cut off point. Once the water is 'up to temperature', the heater will not operate for some time, especially in large tanks, so running costs are very reasonable.

Although most units are combined (as the bottom one in this photo), separate heaters and thermostats are also available, as shown.

Modern internal thermostats have easily-accessible temperature controls but do check that the unit is suitable for complete immersion before installing — some units were designed to be semi-immersed only, ie, with the control knob sticking out above the water.

If you need to remove the unit from the water to make adjustments **always remember to switch off while making any adjustments** and give the heater time to cool down, too, before handling it.

Internal heating equipment can usually be hidden behind rocks or plants and one enterprising manufacturer offers a heater/thermostat unit with aquarium plant decorations on the outside to camouflage it more effectively in the aquarium.

Separate heaters and thermostatic units may still be obtained, although this method of use is becoming much less common. Thermostats used in this way tend to be of the external type (again, electromechanical in operation or, increasingly, using micro-chip circuitry). External electromechanical units need to be fixed up against the aquarium glass in order to sense the temperature, but electronic types can be sited well away from the damp conditions of the tank, as only the temperature sensor (on the end of a fairly long wire) needs to be in the tank.

One method of heating which does require a separate thermostat is cable-heating; here, the heating cable is buried in the substrate and, of course, needs connection to a thermostat. There is even a form of water 'heating' which uses no thermostat, and that is the outside pool heater; this simply floats supported by its polystyrene collar in the pool to preserve a ventilation hole in the ice. Obviously with the

volume of water concerned and the degree of heat provided (Whoops! My first unintentional pun of the '90s!) no thermostatic control is needed. A recent model of pool heater has a brass cartridge element which is said to be very robust; at least, it won't break if you drop it or if it gets pushed around the pool.

Fish-house owners, particularly fish breeders, may prefer the separate heater/thermostat arrangement as it gives a convenient way of altering water temperature when setting up breeding tanks at short notice. It is possible to operate several heaters from one 'master' thermostat, but the thermostat used must be capable of handling the total current used by all heaters operating at once, and all the heaters must be sized according to the tanks used.

While on the subject of fish-houses, a popular 'external' method of heating is to 'space-heat' the whole area. This might prove to be more cost-effective (although more physically discomforting to work in at times), provided the fish-house is well-insulated to minimise heat-losses. Again, with any form of space heating, thermostatic control is desirable, although overall temperature control may be slightly more difficult with oil-heaters. A simple method of achieving different tank water temperatures in space-heated rooms is to move the required tank up to a higher site (for higher temperatures) or down to a lower one (for cooler conditions).

A further external method of heating individual tanks is by use of heater 'pads'. These fit *above* the polystyrene slab on which the tank sits and warm the water through the base of the tank. One or two points ought be be considered here: with large tanks it might be prudent to fit *two* pads (of sufficient combined dimensions to fit the whole base area and each independently thermostatically-controlled) to provide a 'failsafe' system, should one pad fail. Remember, that with this system of tank heating, to replace a pad, the whole tank has to be emptied out, moved away and then re-set up again! Fortunately, heating pads usually come with a lengthy guarantee!

JANE BULLOCK

In thermo-filters, the water is heated at the same time as it is filtered. Such units are suitable for freshwater use only.

A small technical point, too, is that you may experience a small 'tingle' when putting your hand into a heating-pad equipped tank. This is due to the capacitance built up between the heating element, glass base and the water. It is not dangerous, even if you are well-earthed through a wet fish-house floor, as very little electrical current is passed but it still makes you jump! As with heating cables buried in the substrate, heating pads heat the aquarium from below, with the substrate getting advantage of any generated heat first. It would be interesting to know what effect this has on plant growth and, if at all, what species benefit (or not) from this form of heating.

Finally, some larger models of external power filters are referred to as 'thermo-filters': these have thermostatically-controlled heaters built into them, and so, heat the water at the same time as they filter it. Such filters are only suitable for freshwater use.


STEPHEN SMITH

External thermostats usually clip on to the outside of the tank.

NEW PRODUCTS

INTERPET

Just as Barnun & Bailey's Three Ring Circus attracted justifiable acclaim, so too will another three-ring attraction **INTERPET's** new 3 SEASONS ORNAMENTAL POND FISH FOOD HOOPS and KOI SEASONS FOOD HOOPS. For those readers who have been counting, I should explain that the reference to three-rings comes about because, in fact, the Koi food comes in two separate formulae, for spring/autumn and summer feeding.

Said to be the smallest food rings, the hoop-shapes are the result of Interpet's recent entry into the extrusion business; the computer-controlled process allows exact ingredient formulation and the resultant hoop-shape has a high surface area/volume ratio, making for easy wetting and improved acceptability by the fish.

The reason for two formulations for Koi is because of the difference in food requirements at differing water temperatures. Spring and autumn water temperatures mirror each other almost exactly and the nutritional needs at these times are also similar. In spring, the fish require easily-digestible proteins to overcome winter lethargy and build up energy, while in autumn, the same foods allow rapid build up of reserves for overwintering; wheatgerm is a vital ingredient. In summer, the formulation is changed, as research has shown an increase of around 20% of vegetable matter is beneficial. Protein level is around 33% to maximise digestion at typical UK summer water temperatures.

The 3 Seasons Pond Food includes a natural colour enhancer and is suitable for all pond fish including Orfe, Rudd and Tench. Careful formulation ensures minimum levels of ammonia waste products, and so reduces the strain on biological filter systems too.

All foods are available in 1, 3 and 6 litre sizes. Prices (at time of going to press) are £1.86, £4.75 and £7.87 respectively for 3 Seasons Ornamental Pond Foods and £2.75, £6.70 and £10.50 for Koi Seasons.

Details of all products from: **INTERPET LTD, Interpet House, Vincent Lane, Dorking, Surrey, RH4 3YX (Tel: 0306 881033).**

ALGARDE

Condensation covers/trays are much more manageable, especially with wet hands, when made out of plastic rather than glass. **ALGARDE** have added two new sizes to their popular range, perhaps reflecting a swing to deeper (front to back) tanks? The two new sizes are 15in x 19in and 15in x 24in costing £2.88 and £2.95 respectively.

If you're thinking of slipping away for a weekend or slightly longer, then the company's VACATION and WEEKEND FEEDING BLOCKS (59p each) will look after things until you get back.

Details of all the company's products from: **ALGARDE LTD, Enterprise House, Cranes Close, Basildon, Essex, SS14 3JB (Tel: 0268 289200. Fax: 0268 520949).**

ARMITAGE

The life support system for fishes, according to **ARMITAGE BROS LTD,** will certainly contain two of their NIMROD products — thermostatic heaters and airpumps. The two models (150 watt and 200 watt) in the PRESET-MATIC range are factory-set, fixed temperature heaters (25°C/78°F). The THERMOSTATIC HEATERS with adjustable temperature controls are available in five ratings (75 watt to 300 watt) and have a temperature range of 20°C to 30°C (68°F-86°F).

NIMROD AIRPUMPS are available in two styles — Numbers 1 and 2 (Economy) and 3 and 4 (Premium). Depending on model number, both 'Economy' and 'Premium' pumps have single or double outlets; electrical consumption for the former can be said to be truly miserly, while the Premium pumps are equipped with a rheostat control to adjust airflow output.

Details of all products from: **ARMITAGE BROS PLC, Colwick, Nottingham, England (Tel: 0602 614984. Fax: 0602 617496).**

tained in certain types of plastic container, or supplied with water through specific types of plastic pipe. Acrylic and phenolic plastics are the most hazardous in this respect. PCB's can leach into water which is in contact with these types of plastic. The water thus becomes contaminated with toxic chlorinated organic compounds.

PCB's are very stable compounds. They build up in the body when they are ingested with the food and/or water. Post-mortem analyses have revealed that the highest concentrations are found in the fat bodies and the liver of vertebrates. PCB's are not broken down by the animals' normal excretory functions. Due to this stability and subsequent build-up in environmental food-chains, British-made PCB's have not been used in the manufacture of plastics since 1971. This was a voluntary code of practice — European legislation followed in 1974. However, plastics made elsewhere in the world are not necessarily free from PCB's.

As their name suggests, plastics still contain plasticisers — other than PCB's. The inclusion of plasticisers during manufacture makes plastics flexible to varying standards. Very pliable plastics may contain up to 40% of their total weight as plasticiser.

Plasticisers are often volatile. This property of vaporising readily gives many new plastic buckets and bowls their characteristic smell. As plasticisers are progressively lost, pliable plastic becomes increasingly brittle, a process of deterioration which is speeded up with an increase in temperature. Therefore, submersible heaters should be prevented from touching the sides of plastic aquaria. Similarly, it is inadvisable to use a heating pad underneath a plastic tank.

Deterioration of the plasticiers can result in organic salts, called ESTERS, being released into the water. When this water is swallowed, the dissolved salts are absorbed into the bloodstream through the wall of the gut. Esters are known to have toxic effects on livestock.

Plastic containers are undoubtedly an inexpensive way of housing amphibians. They also have the advantage of being easy to clean on a regular basis. However, to ensure the long term health of captive amphibians, it is advisable to follow a few simple rules:

(1) Do not use tanks made from phenolic plastics.
(2) When rearing the aquatic larvae of amphibians (tadpoles), it is safer to use containers made from rigid plastic. These will have a low plasticiser content.
(3) If running water is supplied to breeding tanks, perhaps through a filtration system, the pipe work should be of good quality, i.e. made from 'high density' polyethylene (polythene) or polypropylene.

When plastic containers are used for housing reptiles, e.g. Geckos, it also makes sense to avoid plastics which will release volatile organic materials to the deteriment of the inhabitants.

Your questions answered

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Every query receives a personal answer and, in addition, we will publish a selection of the most interesting questions and responses each month.

Please indicate clearly on the top left hand corner of your envelope the name of the experts to whom your query should be directed. All letters must be accompanied by a S.A.E. and addressed to:

Your Questions Answered,
The Aquarist & Pondkeeper, 9 Tufton Street,
Ashford, Kent TN23 1QN

Herpetology, Julian Sims. **Koi,** Roger Cleaver. **Tropical,** Dr. David Ford. **Coldwater,** Pauline Hodgkinson. **Plants,** Barry James. **Discus,** Eberhard Schulze. **Marine,** Graham Cox.

HERPETOLOGY

Identical differences

I have two Red-eared Terrapins, both about 18 months old. Their weights and sizes are as follows:
1. 410 gm and 13.75 cm carapace length.
2. 260 gm and 11.5cm carapace length.

Are such differences normal? They seem too large for two terrapins which have been reared in identical conditions.

The size difference described between two terrapins of the same age kept in similar conditions is almost certainly an example of *sexual dimorphism*, i.e. there is a difference in the external features between males and females.

Female Red-eared Terrapins *(Pseudemys scripta elegans)* generally grow much larger than males. Other differences between the two sexes include:

(i) The claws on the front limbs of male Red-eared Terrapins grow very long and are used in courtship of female terrapins.
(ii) The tail of a male terrapin is usually broader and longer than that of a female.
(iii) The head of a male terrapin tends to be slightly more pointed than that of a female.

Young Red-eared Terrapins such as these will grow into differently sized adults, according to sex.

TROPICAL

Snakehead warning

I have recently acquired two young Snakeheads (Channa micropeltes). *Can you give me some information on these fish — and Snakeheads in general?*

Channa micropeltes is the Red Snakehead from South-east Asia, where it is a true predator, often killing its prey without eating it. It is indeed a greedy fish and the small, young specimens will bite anything, so it is easy to feed them chunky foods. However, as they age, the need for living prey is paramount and you will have problems.

All Snakeheads are hardy, and so, accept most water types and aquarium conditions. They can even, air breathe, in a foul tank and recover well from any chilling. The intense colours of the young fish fade with age, the black stripes becoming blotchy.

In the wild the Red Snakehead reaches 3ft (c 90cm). It is a great jumper too, so keep a tight lid on the tank.

The large adults will kill all other fish in an aquarium and then happily bite their owner. You have been warned!

Snakeheads are large predatory fish which should only be kept by aquarists who can cater for their needs.

Root of the problem

I have just obtained a tree root. It is about 24in (60cm) long so it's a bit of a problem getting it into my tank at the moment. How should I treat it to render it safe to use . . . and make it sink?

Tree roots (and branches or logs) contain sap that elutes into the water, causing bacterial blooms. This is why pieces of petrified wood or bogwood are normally used in aquaria.

To use your piece of wood, you must isolate it from the water. Use a good quality polyurethane clear varnish (DIY stores). Give the wood at least three coats, allowing each to harden thoroughly; then rinse well before use.

The wood will still be buoyant, so lash it to a slate base with nylon cord, or glue it on with silicone sealer. Another method is to drill a hole in a piece of slate and screw the wood to the base (seal the screw head with the varnish). Then place the assembly in the required position and cover the slate with the gravel.

DISCUS

Discus contacts

I wonder if you would be able to put me in touch with Discus keepers in other countries, such as Germany or the USA, as I am very keen to learn.

I suggest that you contact:

Herr Horst W. Koehler, Postfach 101926, 8900 Augsburg, West Germany. Herr Koehler is the publisher of a quarterly magazine called **'Diskus Brief'. 'Diskus Brief'** is really an up-date and also contains many small ads from hobbyists and breeders.

For America I suggest that you contact Ellen Halligan, 73-47 184th Street, Flushing, N.Y.11366, USA.

You could, perhaps even join the **Discus Study Group.** The international membership rates are only US $21.00.

I am sure there will be many American Discus keepers willing to correspond with you. Only by 'talking' to other hobbyists will you be able to find out how they are doing certain things and be kept informed and learn all that there is to know. (Well not everything . . .!)

MARINE

Local problem

I have a 56 x 55 x 21cm (c 22 x 22 x 8in) tank stocked with one Tomato Clown (3in — 7.6cm), one Marginate Damsel (2in — 5cm), one Blue Velvet Damsel (3in — 7.6cm), one Bicolour Cherub Angel (4in — 10cm), one Marine Fighter (3in — 7.6 cm), local fish, two 6in (15cm) pieces of living rock, seven 5in (c 13cm) anemones, one Cleaner Shrimp, two Tubeworms, one small Urchin and a few dead corals. Ammonia and nitrite readings are zero; filtration consists of a biological filter and a small internal power filter. I would welcome your comments on the above stocking level.

Although you may not be aware of it, your tank's gross capacity is only 35 gallons (c160 litres). This means that after allowing for displacement of water by the rocks and dead corals, you probably have only 32 gallons (144 litres) of actual seawater.

In addition to all the fishes which you list the actual size of, the mysterious, unquantified statement — 'LOCAL FISH' rings alarm bells!

With a simple undergravel filter, plus small internal filter, and in view of the fact that you are obviously a beginner, I seriously suggest that you shouldn't exceed a stocking ratio of 1 inch of fish to each 4 gallons of seawater (2·5cm/18l). This, of course, means that your tank should only contain 32 ÷ 4 = 8 inches (20cm) of fish in total.

From the above you will see that you are seriously overstocked. I don't know whose Nitrite and Ammonia Test Kits you are using, but unless your feeding is exceptionally miserly, I find it hard to believe that you have no readings.

I suggest that you either sell off at least half your fishes, or buy a new tank at least twice as large as your present one.

MARTIN HAYWOOD

Not even robust, hardy marines like Clownfish and anemones can withstand overcrowded conditions for long.

Bacteria and Powercuts

I have read that, when using undergravel filtration of any kind, the water must flow through the coral sand filterbed at all times otherwise the nitrifying bacteria will die. Is this true? If so, how then can I clean the filter media in an external power filter-operated reverse flow undergravel system? This necessarily means that the filter must be turned off first — thus stopping the water flow.

The vitally important nitrifying bacteria, i.e. filtration bacteria, which live in their millions on the outside and inside the porous structure of each grain of coral sand, are indeed aerobic. That is to say that, like ourselves, they breathe in oxygen and breathe out carbon dioxide. However, due to their relatively slow metabolism (i.e. compared to an animal), their rate of uptake of oxygen is also rather slow.

During the crippling electricity strikes of the 1970s, we at Waterlife Research, were suffering electricity power cuts several times each day. Some of these were in excess of two hours' duration each. All our 5,000 gallons-worth of tropical marine tanks (22,500l) are on airlift-operated undergravel filtration systems. During these terrible weeks that the powercuts persisted, we never recorded a single nitrite reading and we didn't lose a single fish or invertebrate. Our tanks were reasonably-heavily stocked at the time.

I have always put this down to the following factors:

(i) Our seawater was already saturated with oxygen as each powercut started.

(ii) A great deal of gas exchange (i.e. oxygen in and carbon dioxide out) takes place at the water surface.

(iii) Due to the very slow oxygen uptake, it obviously takes longer than two hours for the dissolved oxygen in the water surrounding each coral sand particle to fall below the critical 1½-2 mg/litre level at which the nitrifying bacteria begin to aestivate, i.e. they don't die off, anyway, even at this very low level of dissolved oxygen; they simply go into a state of suspended animation. They return to full activity as soon as the dissolved oxygen level begins to rise again.

PLANTS

Propagating Cryptos

How would you suggest I set about propagating Cryptocorynes?

Use a good quality growing medium with added fertilisers. Lower the water level to 6-8in (15-20cm) deep at the most. Then cover the aquarium to ensure a high level of humidity, but keep the light regime as normal for the species concerned.

This should encourage the plants to flower but will not, of course, ensure pollination, which you may have to carry out yourself using a fine brush.

Mature seeds can be sown on moist compost or other suitable rooting medium, in warm, humid conditions.

BETTY CADEY

Cryptocorynes will only flower in shallow water or moist soil with high air humidity.

KOI

Identity crisis

Can you identify my Koi? At first glance it is a Kohaku, but it has a metallic overlay to the scales. In addition, the white flanks have the look of a Matsuba. Could it be a Matsuba Kohaku? I am very fond of this fish and would therefore like to know what it actually is.

It is difficult, without seeing a colour photograph of your fish, to give an accurate identification. There is a Koi which is red and white and metallic. It is called a Sakura Oghon and is the metallic version of a Kohaku.

Although you say in your description that it looks like a Kohaku with a metallic sheen, you also say the flanks have the look of a Matsuba. Matsubas have a 'pine cone' effect on the scales, i.e. a dark edging. If this is the case, then I must admit I have never seen a fish like it. There is certainly not a Matsuba Kohaku!

As you say, the fish means a lot to you, so does it really matter what variety it is? A useful source of information would be Dr Kuroki's book, **Modern Nishikigoi,** where many varied and unique fish are discussed.

NOEL CADDOCK

Matsuba (this is a Kin Matsuba owned by Gregory Peck) have a characteristic 'pine cone' effect on the scales which make them immediately identifiable.

"Fish on the fin"

I have a 12ft x 4½ft x 18in pond stocked with plants, goldfish and two Red-eared Terrapins. I have been losing a lot of fish lately. Could the terrapins be affecting the water conditions, thus causing the death of the fish?

I was rather shocked to learn that you are attempting to keep terrapins in the same environment as fish. A terrapin's diet is varied. Even so, these creatures are predominantly meat eaters, so that means fish . . . and what could be better than having your own meat on the hoof, or fish on the fin, swimming around just for the catching? A bit like having one's very own supermarket without the cash tills; just take what you fancy!

This situation must be very stressful for the fish, resisting being caught and constantly being harassed, which, of course, will result in the deterioration of their good health.

Terrapins are interesting creatures to keep and study, but, please ensure that they are kept well away from tanks or ponds which contain live fish, unless, of course, the fish are intended as likely dinners for the reptiles.

Congested Veiltails

I have seven Veiltails in a 30 x 18 x 12in (76 x 45 x 30cm) tank serviced by an undergravel filter with two uplifts. I change about 30% of the water every three or four weeks. The temperature is 20-22°C (68-72°F). There is a strip light (on for 7-10 hours per day) and four bunches of 'weed'. In addition to flake food the fish are given Daphnia *once a week.*

The problem is that the caudal fin in most of my fish becomes red from time to time. The reddening always starts at the fin edges and works its way inwards. It usually disappears after a while but then returns. Can you help me with this problem?

LAURENCE E PERKINS

Fancy varieties with long flowing fringes, like this Veiltail, are more susceptible to fin congestion than 'more basic' types.

Veiltails, like other varieties of the goldfish which have long, broad, flowing finnage, are subject to fin congestion, and so need rather more care than the more robust, short-finned types.

Causes of this type of inflammation are: poor water quality, unsuitable environment, overcrowding, poor diet, fluctuating water temperatures, low water temperatures, rough handling; in fact, some fish, even though conditions appear to be ideal, are constant sufferers.

In your letter you tell me that you have seven fish in your tank, but as you do not say what their sizes are, I have no way of knowing if crowded conditions could be a contributory factor.

It is very important that your fish have plenty of room to live their lives. Allow at least 24-30 square inches (around 900 sq cm) of surface area to each inch (2.5cm) of fish to avoid stress.

Although you have a filter in operation in your tank, you really need to change small volumes of the tank water more frequently. I suggest that you change about a ¼ of the volume about two or three times each week. Changing small amounts like this means that there is no need to add any extra water treatments. Siphon the mulm and debris from the base by disturbing the gravel so that particles of food do not remain to rot and pollute the environment.

On the question of water temperatures, although Veiltails are one of the more delicate types and usually suffer badly from continuous low water temperatures, they are quite able to thrive at room temperatures. They do very well in temperatures around 65°F (15.5°C). In fact, they tend to become pale in colour and over-finned in prolonged high temperatures. They, like all goldfish, are better described as temperate, preferring moderate temperatures rather than cold or tropical waters.

The diet should be nutritious and varied, with the inclusion of livefoods to improve fitness and vitality. Chopped earthworms are excellent, white worms, *Daphnia*, bloodworms, mosquito larvae are all greedily accepted. Good-quality flake and freeze-dried foods are all good basic foods, but do take care that flake is well soaked by holding between fingers under the water until it sinks so that it is not eaten dry.

Books

Freshwater Fishes of Australia

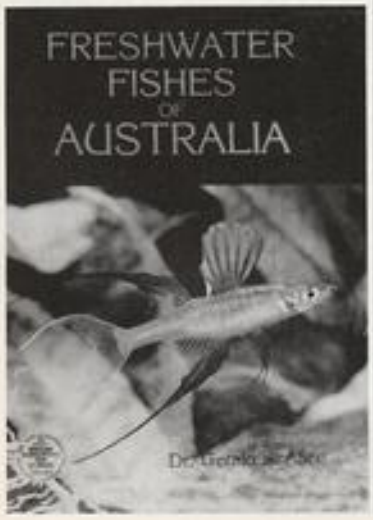
By: Dr Gerald R Allen
Published by: **T.F.H. Publications, Inc**
Price: £25.95
ISBN: 0-86622-936-1

It came as a bit of a surprise to me to learn that Australia only has some 180 known species of freshwater fish. And that wasn't the only surprise, either. These fish, for example, are nearly all unique to Australia and are spread over no fewer than 35 families.

In addition, Guppies, Mollies, Mosquito Fish, One-spot Livebearers, Swordtails, Platies, Rosy Barbs, American Flagfish, Convict Cichlids, Jack Dempseys, Mozambique Mouthbrooders, Redfin Perch, Goldfish and even Chinook Salmon (along with some other non-native species) can now be found in a variety of Australian waters.

These introduced species have appeared both as a result of intentional releases (the food fishes) and through the action of "irresponsible hobbyists". Whatever their origin, they are now established to a greater or lesser extent and are therefore included in Gerry Allen's impressive book which took ten years of intense of study on the part of the author and a whole host of other colleagues — all duly acknowledged on page 6.

It is fair to say that a comprehensive review of Australian freshwater fishes has long been overdue, and not just to show people that there are more than just Rainbowfishes in this part of the world. My feeling is that Gerry Allen has plugged this gap admirably, presenting a detailed, readable, and well-informed account of a hitherto largely unknown aspect of Australia's rich fauna.



The text is excellently supported by distribution maps for all the species, small line-drawings of selected species, and 64 colour plates, each containing eight photographs of individual fish or biotopes.

This large volume must surely be the most comprehensive and readily accessible work on Australian fishes yet published. Full marks, both to the author for his tenacity over a ten-year period, and to T.F.H. for taking the project on.

John Dawes

Atlas of Killifishes of the Old World

By: Jorgen J Scheel
Published by: **T.F.H. Publications, Inc**
Price: £59.95
ISBN: 0-86622-668-0

Killifish fans all over the world will know the name Jorgen Scheel. Not all will, however, know that he died last year (13 April 1989), leaving a gap that will be difficult, if not impossible, to fill.

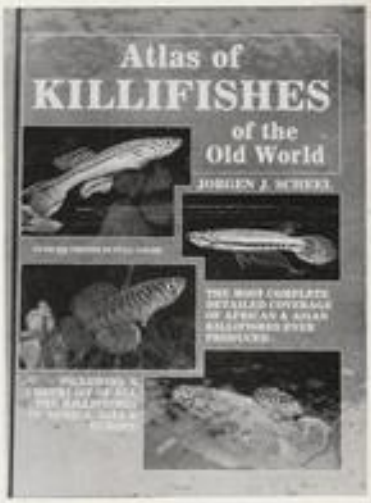
Again, most Killifish enthusiasts will be familiar with Scheel's 1968 **Rivulins of the World**, often abbreviated as ROTOW. The present book is a completely revised version of this standard work and, as such, represents the fruits of a lifetime's dedication to the study of these fascinating, colourful fish.

Packed with colour, essential data, never-before-seen illustrations (such as karyotypes — chromosome composition — of some species), detailed distribution maps, spawning shots, biotopes and some superb portraits, the **Atlas** is, in my opinion, an absolute must for anyone interested in Killies. Hobbyists and ichthyologists alike will benefit from this book, despite the fact that Killifish nomenclature seems to be susceptible to the same 'fluidity' that affects the cichlids.

I was disappointed to see that Scheel adopted Rosen's 1964 classification, rather than the more modern and, in my view, more accurate and representative one put forward by Lynne Parenti in 1981. If the decision to opt for the Rosen version was made after considering Parenti's proposals then, some mention, at least, should have been made of the latter's work which, after all, constitutes a major revolution in cyprinodontiform classification. To ignore it would indicate either ignorance of the work in question (which is most unlikely) or non-acceptance (a distinct possibility). Either way, discussion of the topic would have helped round off what, in every other way, is the most extensive and impressive, single-volume work ever published on the Killifish of the Old World . . . worth every penny of its equally impressive cover price.

Were we approaching Christmas, rather than spring, I would put the **Atlas** forward as the perfect gift for the dedicated Killifish fan. As it is, I would put it forward as the perfect Easter present instead.

John Dawes



OUT AND ABOUT——

Continued from page 70

national aquarium shows where they sold at three guineas each — £3 3s 0d in those days, or 63/-. Frequently all the tanks had already been sold to other exhibitors even before the show opened.

"In the early 1950s," Laurie Morris told me, "there were Labour Government crises, and aluminium was soon in short supply as it was all going to America because of a dollar crisis." Around that time Charlie and Alex decided to emigrate, leaving Laurie to carry on Ulster Aquatics. Laurie kept his shop in Beersbridge Road from around 1950-1959, and I can still remember the concrete grotto effects that Charlie had built in the shop. The firm had also set up little public displays in the town of Bangor, in Barry's Amusement Arcade; and at Dun Laoghaire, near Dublin, in Eire.

Laurie told me that around 1948, Neons cost 35/- (a fortune in those days), Platies 2/6, Zebras 2/-, heaters around 11/6, and thermostats 10/-, or 14/6 with a neon indicator. It is pointless to convert shillings and pence from those days into current pounds and pence, but a useful comparison can be had from the fact that a heater and thermostat then cost about 24/6, and a Neon Tetra cost about half as much *more*. Today, that would perhaps be something like £15 for a Neon Tetra (taking account of inflation)!

Laurie also reminded me that, in those days, there were no polythene bags, and most callers at the shop took their purchases home in jam jars. Local lads were paid ½d (an 'old' halfpenny) each for jam jars. 'Real' aquarists had a half sweet bottle, in a lined wooden box, for their purchases; and I'm not ashamed to say that I still have my boxed sweet jar, even though I have not used it for years.

Some of the young lads from those days were **Jimmy, Billy, Sammy Cahoon** and **Alfie Robbins.** Sammy Cahoon went to South Africa as a printer and now owns a fish farm in Zimbabwe. Other names that featured in that time were those of **Tommy McGarry** and **Frank Shane,** both of whom bred and sold fish. From around 1947, a 12-year-old lad visited Ulster Aquatics after school each day to help in the shop. He was Alf Robbins — of whom more anon.

A large anemone displays its tentacles at Grosvenor Tropicals.

Laurie Morris told me that, in 1950, goldfish cost £40 per thousand in London, but only £4 per thousand in Italy. He built ponds and imported his own fish; but many died on the long journey from Italy to Ulster.

Around 1959 Laurie transferred his shop from Beersbridge Road into Montgomery Street, in the centre of the city. The business thrived but met with problems because of the troubles in Belfast. An auction mart above Ulster Aquatics was bombed and water flooded down into the aquarium shop — and the aquariums. The water also got into the plugs and affected the heating; but, amazingly, no fish were lost. Dye from the roof was washed down into the tanks and the water was all yellow. All the fish were fished out, by torch-light, because of the power having been cut off by the explosion, and were transported to Laurie's fish house at his home.

It was 1979 and Laurie again decided to transfer his business — this time to Hope Street, in central Belfast, where it now is. Unfortunately the council have placed a demolition order on the premises, and all the other buildings in the street have already been pulled down; so it is just a matter of time before Ulster Aquatics gets closed down.

Laurie has two other children, as well as daughter Eleanor. **Philip,** who used to work in the shop, now runs a bar in Tenerife; and his son **Ian,** a teacher for 10 years, now owns a fish shop in Dublin, in Eire.

"My favourites have always been the small, hardy, colourful species, such as Guppies, Neons, Zebras and Platies," Laurie told me.

If we jump back in time to the late 1940s we discover how Alf Robbins, then a 12-year-old, ended up owning his own shop, Grosvenor Tropicals, on Beersbridge Road. Apparently, Alf's mother lived in Mayflower Street, on Beersbridge Road, and schoolboy Alf worked in Ulster Aquatics after school each day, as I mentioned earlier. Eventually, Alf opened his own first shop in Mount Street, off Woodstock Road, Belfast, in 1968; and around 1978 he moved to Beersbridge Road, where his thriving business stands. He and his wife **Rena** both work there, and employ numbers of other full-time and part-time staff.

Alf told me about the Ulster Aquarium Society, which thrived years ago and had around 300 members; and Laurie told me that Alf took on the Junior Section of the Ulster Aquarium Society. Certainly both gentlemen, over the years, have done a lot to encourage the hobby, particularly among young people — and I speak as one of those former young people myself.

Custom-designed marine aquarium costing about £200, completed and ready for delivery at Grosvenor Tropicals.

Alf and his friends have a thriving aquarium club in Bangor, County Down, and, like me, are happy to cross the world to see tropical fish. Alf and four other Bangor lads have been on trips to Freetown, in Sierrra Leone; Manaus, in Brazil; and Leticia, in Colombia; indeed, it was on one of such trips that Alf Robbins, and our Editor, **John Dawes,** first met.

I got the impression from both Alf and Laurie that tropical fishkeeping used to be a rather middle-class hobby, but that after prices dropped, it became available to all classes of people. Fishes are the most popular pets in the world, probably because common species can now be purchased for 40p-£1 in the UK. Any ordinary person, with an aquarium in his or her living room, can become an expert at no great expense.

Alf Robbins and Laurie Morris are gentlemen — and *gentle men* — and they have served the hobby exceptionally well in Northern Ireland. It's sad to think that Laurie, in his seventies and still selling fish, will soon lose his shop and retire; but the hobby will remain in the expert hands of Alf, Laurie's one-time, schoolboy assistant, whose splendid shop display is much better than those in numbers of zoos and public aquaria I have visited.

I'm sure all Ulster aquarists will wish to join me in sending best wishes to both chaps — and especially to Laurie Morris when his shop is closed down and he finally does retire. There are other good aquarium shops in Northern Ireland, but Ulster Aquatics' Laurie Morris, and Grosvenor Tropicals' Alf Robbins, will always be held in special esteem as two of the founding fathers of the tropical aquarium hobby in Ulster.

Incidentally, I should be pleased to hear from other Ulster aquarists with interesting stories to recount about the early days of the hobby and allied shops. Please write to me, c/o The Editor, at *A & P.*

Dr GARETH EVANS

An adult toad (probably a male). The large parotid glands, situated behind the eyes, are clearly visible in this specimen.

WARTS AND ALL

Despite its warty appearance, the Common Toad remains one of our best-loved amphibians. It has some surprising lines of defence too, as **Dr Gareth Evans** reveals.

FEW childhoods can have passed without at least a glimpse of the endearing image of Kenneth Grahame's "Mr Toad" and his passion for motor cars. Away from the world of "Wind in the Willows", while country lanes may not echo to the manic "poop-pooping" of this amiable, if somewhat pompous, amphibian driving his gleaming machine at break-neck speed, there is a link between the real Mr Toad and the car. However, as the many squashed bodies found on roads in March and April testify, the relationship is not an easy one.

The Toad *(Bufo bufo)* is Britain's largest amphibian, and can be readily distinguished from the frog *(Rana temporaria)* by its warty skin, stouter construction, and drier appearance. Moreover, it is less aquatic than its cousin, frequently being encountered some distance away from ponds outside of the breeding season, and often in fairly dry surroundings.

During the day toads seek shelter under stones and tree roots, or among vegetation, emerging at night, and particularly after, or during, rain, to hunt for the slugs, worms, woodlice and insects which make up their diet.

The catching of food itself is a fascinating, if rather comical, performance, with the toad creeping somewhat ponderously up to the prey item. Once in range, the toad fixes its target, staring at it, often with the head slightly askew — a position conferring a rather quizzical look to the amphibian.

When satisifed with its aim, it swiftly flicks its sticky tongue forward, then back, with an audible snap. However, Mr Toad is not always a good shot, and the insect may escape. Perhaps it is as well that toads are capable of surviving considerable periods without food!

The most widely distributed of all European anurans, the toad is ubiquitous throughout its range. It occurs almost everywhere, up to 65°N, except in Iceland, Ireland, Corsica, Sardinia, and the Balearics, and extends to heights in excess of 2,000m (6,500ft) in the Alps.

Toads on Roads

Emerging from hibernation in mid-March to early April, the adult toads make their way to ancestral breeding ponds, travelling under cover of darkness. Relatively warm nights, especially if accompanied with drizzle or light rain, often tempt them out in large numbers to make this seasonal migration.

LAURENCE E PRINCE

The "double strings" of eggs produced by a mating pair of toads can be as much as 5 metres long.

Almost inevitably, in our crowded little island, this, sooner or later, requires them to cross roads on their journey. Sadly, the reality of toads on the highway is far removed from the whimsical fantasy of the river bank, with many fatalities on even the smallest of country lanes.

Indeed, on one 100m stretch of narrow back-road which I have studied for the past four years, around 12% of these amphibians attempting a crossing will not make it. The situation is far worse on larger and busier routes, though toad tunnels, "patrols" and greater public awareness have helped ease the problem.

Breeding

The males, which are smaller and more numerous, generally awake first, followed a few days later by the larger females. If the sexes meet along the way to the breeding site, the male grasps the female about the chest in the mating embrace, or amplexus. Clasping her tightly behind the forelegs, he continues the journey 'jockey-style'.

Occasionally, in their fervour to locate a mate, males may grab others of their own sex, whereupon the grasped animal emits a special "chunk-chunk-chunk" call, informing the frustrated suitor that he's just not that sort of toad!

With females in the minority, competition among the males is intense — at times a female may be completely invisible amid a writhing confusion of amorous amphibians vying for her favours. Rather unsurprisingly, a large, strong male is more likely to keep his female in the face of a challenge from a smaller fellow, or to wrest a mate away from such a toad, should he be in 'occupation'.

What is, however, less immediately obvious is that the vigour and tone of the male's vocalisation seems directly related to his size, and thus his ability to gain, and/or retain a female. In this way, unnecessary and energy-wasteful shoving matches between rivals are often avoided or curtailed.

Once in the pond, the pairs will stay united for a period of around a week, with the peak spawning usually taking place ten days after the first couple have been observed in amplexus. During this time, each female will lay some 3-7,000 eggs, in 2-4 rows, contained within a gelatinous string some 3-5 metres in total length.

Eight to ten days after spawning, the eggs hatch. Though the adult toad is large, its tadpole is one of the smallest, being a mere 4-6mm (¼in) at hatching, and only 2-3cm (approx 1in) immediately prior to metamorphosis.

While frog tadpoles tend to be fairly uniformly distributed around the edges and shallows of the pond, the blacker toad larvae prefer deeper water, frequently being encountered in single large shoals — a fact which can make surveying for their presence in ponds much more difficult.

Metamorphosis takes place in June or July, and the 1cm or so toadlets leave the water to seek shelter in the surrounding countryside, where they will enter hibernation later in the autumn. These young animals will not return to the pond to breed until they become sexually mature at about the age of four.

FAUNA AND FLORA PROTECTION SOCIETY

A "toad jam" at Britain's first-ever Toad Tunnel near Hambledon in Buckinghamshire.

Defences

So slow-moving an animal would seem a guaranteed easy meal for a would-be predator, but the toad has two lines of defence to help it avoid suffering this fate — one passive, the other active.

When alarmed the animal inflates its body, and by standing on the tip-toes of stiffly extended legs, adopts a strange "bottoms-up" posture. The position is held for a few moments before the creature sinks down, to repeat the procedure if the threat remains. This tactic seems to be evoked principally in response to a hunting snake, typically a Grass Snake (*Natrix natrix*), which features amphibians heavily in its diet. Since the reptile almost invariably takes its prey head-on, presumably this strange stance is designed to baffle the predator by making the toad appear a much bigger mouthful than it really is.

Probably the creature's most obvious features, the two prominent swellings behind its eyes, known as the parotid glands, are very largely responsible for its second line of defence. These and other, smaller, glands in the toad's skin, secrete bitter-tasting toxins to dissuade potential predators. Despite this unpalatability, toads may occasionally be killed by cats and other predators — though not eaten.

Barring misfortunes, however, toads have a fairly long life expectancy, individuals having lived for forty years or more.

In the Garden

These animals are more "pond-loyal" than certain of the other British amphibians — and nowhere near so fickle as the frog in their choice of breeding sites. This is one of the main reasons for the successes of the latter species in garden ponds, and the relative scarcity of the former in such bodies of water, though their preference for deeper water than is commonly to be offered by ornamental pools may also be a factor in this.

However, toads *can* be introduced into a suitable pond. This is probably best done as spawn — the local Wildlife Trust of the Nature Conservancy Council can often provide information as to sources — and though, with such slow-maturing animals it will be a fairly long time before the new colony becomes established and breeding, the wait will have been well worth it.

Not only will the garden be playing an important practical part in the conservation of one of our vulnerable species, but it will also be protected from slugs and many other common garden nuisances by a team of efficient and environmentally-friendly amphibian pest controllers. Mr Toad certainly pays his way!


© DAVID TRANS

The mating clasp (amplexus).

Coldwater jottings

Stephen J. Smith

The Ryukin (this fine example was pictured at Aquarama '89 in Singapore) has been scarcely in evidence over the past decade, but could enjoy a revival in popularity as interest in Fancy Goldfish increases and importers become more aware of the range of magnificent fish available from South East Asia.

NEW SEASON HERALDS GROWTH IN GOLDFISH HOBBY

Several new varieties of Fancy Goldfish have been introduced into the UK hobby over recent years, many of which have appeared in *Aquarist & Pondkeeper;* but the new decade could herald a further upsurge of interest in this specialist area of the hobby, with several exciting and new varieties finding huge popularity.

The pages of this publication have featured a number of the new Goldfish varieties introduced over recent years, such as the Hamanishiki and Jikin, as well as some of the traditional types, such as the Oranda and Shubunkin, for example. This latter category forms the backbone of the hobby and will, of course, remain so. But, in my opinion, the appearance of the Fancy Goldfish scene over the forthcoming decade looks likely to change drastically, with a wide range of exciting, big, and beautiful Fancies capturing the imagination of the fishkeeping public.

My own visit to Singapore last summer produced some exciting revelations. What fishkeeper could fail to appreciate the splendour of Orandas some ten inches from tip to tail; or the most beautiful Ryukins of a similar size and with perfect markings?

I spoke with **Andrew Hudson**, of Ash Holt Aquatics, the day after he returned from a tour of Singapore and Hong Kong in January, and who, despite jet lag, was extremely excited about the fish he had seen during his short tour. "The fish can only be described as fantastic," he explained, "The size and quality of Fancy Goldfish available from Far East Asia has to be seen to be believed."

One particular example he described as a 'Velvet Oranda', which was a purple colour with a red cap. "There are, apparently, only about a dozen in Hong Kong, and I saw offers of several thousands of pounds made for these fish," said Andrew, whose company has recently been appointed sole UK agent for Phoenix Fisheries of Hong Kong.

Andrew remarked that 1989 had been a very good year, with the public responding warmly to the large, quality fish imported from the Far East, notably Singapore, and he is in the process of extending his premises at Finningley, near Doncaster, to house the new Goldfish varieties.

"Some of the varieties we are introducing into the UK for the first time," added Andrew. "These include Black and White Butterflies, ten-inch long Bubble Eyes, Pearlscales the size of tennis balls, enormous Orandas, and Ranchus at around ten inches."

Andrew continued, "The Fancy Goldfish market is just beginning to take off. People have demonstrated over the past year that they are willing to pay extra for quality. The goldfish we are importing are the best out of Hong Kong and unequalled anywhere in the UK."

1990 promises to be an exciting year for Andrew and Ash Holt Aquatics, who aims to be the UK's largest stockist of Chinese Fancy Goldfish over the next few years.

More importantly for the hobby, the next decade could be most exciting for the Goldfish-keeper. The challenge to existing breeders and 'rising stars' alike, is to select the best of the new varieties and improve upon them in order that the UK can continue to lead the field in quality, hardy Goldfish which, even now, are the envy of hobbyists all over the world.

If you wish to contact Andrew Hudson, he can be reached at **Ash Holt Aquatics, Bank End Road, Finningley, Doncaster, DN10 6EX; Telephone: 0302 771667.**

DATE FOR YOUR DIARY

Following the success of Interpet's Brighton Festival of Fishkeeping many moons ago (eighteen months or so), the company is to provide what promises to be a similarly spectacular event in November — so get out those diaries and make a note now!

The event will be held over the weekend of **10/11 November** at Sand Bay, Weston-super-Mare. With the grand title of **The Interpet Supreme Festival of Fishkeeping**, it is one event which stands a fair chance of living up to its name, with a special weekend package arranged for exhibitors and visitors alike.

The FBAS Supreme Championship will form a centre-piece of the festival, which will incorporate trade stands as well as special interest displays. The weekend has also been booked in my own diary to mount one of my 'roadshow' displays presenting a selection of Fancy Goldfish and providing advice and guidance, where possible, to coldwater hobbyists.

In addition, six talks will be held, featuring specialists from the aquatic scene; while the special 'weekend break' package which has been arranged by the organisers, Interpet, includes two nights' accommodation (Friday and Saturday) with breakfast, and a cabaret/dinner on the Saturday evening, for an all-in price of only £45. Coach trips for 'fishkeeping widows (or widowers)' are also being organised and, according to Interpet's sales promotions manager, Mike Clarke, "the event will be the biggest fishkeeping spectacular in the UK."

KOI FESTIVAL

And Koi enthusiasts, don't forget **Nishikigoi '90** at Bingley Hall, Staffordshire **(17/18 March).** Organised by a group of Koi dealers comprising Infiltration, Clearwater Koi, Coldstream Koi, Kent Koi and DJ Koi, the event was a great success last year and promises, once again, to be well worth a visit.

For further information, contact **Pauline Smith (evenings only) on 0532 861226.**