

JANUARY 1989

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# AQUARIST

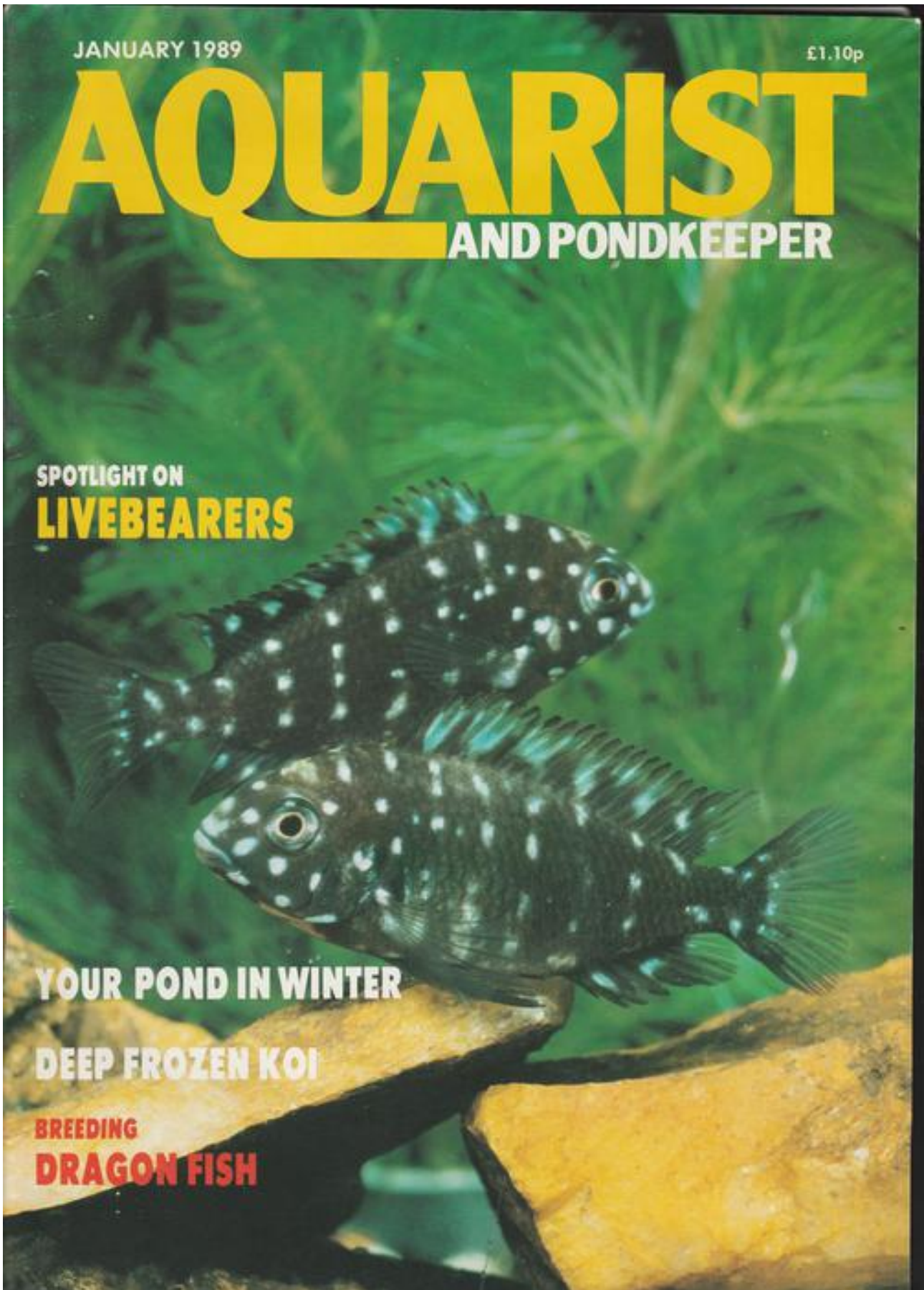
AND PONDKEEPER

SPOTLIGHT ON  
**LIVEBEARERS**

**YOUR POND IN WINTER**

**DEEP FROZEN KOI**

**BREEDING  
DRAGON FISH**





# AQUARIST AND PONDKEEPER

JANUARY 1989  
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## COVER STORY

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*Tropheus duboisi* is a Lake Tanganyika mouthbrooder which is sometimes called the White-spotted Cichlid — an inappropriate label when applied to adult fish, but a perfectly apt one when referring to juveniles. *T. duboisi* is a typical African Rift Lake Cichlid in that it requires hard, alkaline water and a temperature around 25°C (77°F). Like its close relative *T. moorii*, *T. duboisi* will take a wide range of foods. However, unlike *T. moorii*, *T. duboisi* is usually found singly, in pairs, or in small groups in the wild. Several (at least four) identifiable populations are known to exist within Lake Tanganyika, but juveniles from these are virtually indistinguishable from each other.

# Welcome to 1989

As promised last month, our January issue is the first in our brand-new series of **Spotlight** editions.

We've chosen Livebearers as our first special group in recognition of the large and still-expanding army of fans which these fish attract.

It seems as if every fishkeeper in history has kept, at least, Guppies at one time or other, and to some, livebearers begin and end with Guppies, or Mollies, Swordtails and Platies. But there's more... much more. The world of livebearers is still full of opportunities for something new, be it a newly-developed strain of fancy Platy or Swordtail, or quite simply, a completely new species altogether.

We've got a brilliant example of the former in our **Spotlight** feature. Is it a Platy, or is it a Swordtail? Take a look and see if you can decide. Whatever your conclusion, there can be no denying that the fish depicted in our spectacular **Spotlight** photograph is a "new", albeit artificial, creation.

Although we may not quite have got a completely new-to-science species among our crop of livebearers, we nevertheless have some very special fish which may well be new to many hobbyists. These include a smashing little fish from Brazil, and a special feature on **Amarillos**, those rather exceptional "true" livebearers from Mexico.

And, if all this manages to convince you that you *must* have some livebearers, we've got just the article for you in our **First Steps** series.

Turning to other matters, have you ever heard of **Deep-frozen Koi**? Neither had I, till I spoke to Jerzy Gawor and he told me of his rather unusual and uplifting experiences with one of his precious fish. Alan Watson took matters further when we discussed the controversial subject of **Ponds in Winter**. He has some rather interesting thoughts on frozen water... have a look at his article and see what I mean.

And, talking of interesting thoughts, Nigel Caddock — never backward in coming forward(!) — has a few thought-provoking things to say concerning **Central Heating for Koi**.

As for myself, well, I thought I'd cast my mind back to August and relive one of the most unforgettable events of my 'aquatic' life in **The Dragon Fish Experience**, complete with never-before-seen pictures.

We also have some very special one-offs — as promised. For example, there's David Armitage on the first-ever importation and spawning of two (or is it three?) species of Bushfish... and on the controversy surrounding their true identities.

No problems of identity with Bill Tomey's portrait of the incredible **Spade-headed Catfish** — just a very authoritative introduction accompanied by some knockout photos.

And these are just some of the tempting items on offer in this packed New Year edition of *A & P*. There are other varied attractions, of course, but for those you'll just have to succumb to temptation and take a proper lengthy look inside.

In any case, there surely can't be a better way to start the new fishkeeping year!

Welcome to 1989.

  
John Dawes  
Editor



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# HAPPY NEW YEAR

Amanda Grimes is given to much musing during the winter months ... not to say anything about her pronounced tendency towards taking things with liberal pinches (bucketfuls) of salt!

I would like to wish you all, the above future — what I would not like to do is add the traditional exclamation mark to it. For me, the celebration is beset, not with exclamations, but questions.

Why, when we are faced with impending credit card statements, horrendous heating bills and three of the most dreary months of the year, do we all become so sentimental? Drunk, I can understand; but maudlin? Dreamily swilling down another crate of booze we can't afford and hanging on each other's shoulders in blissful camaraderie, we sing: "Should wald acquaintance be forgot ...". Of course they should — it was keeping in touch with them that took the phone bill into three figures. The numbing haze of goodwill might help us forget that our smiling bank managers are heating their homes free, gratis, on our overdraft interest but stepping out into half a ton of snow that the local council hasn't yet noticed numbs parts of the body no lager can claim to reach.

Why, you may ask, am I being so negative? Well, it's not my intention — I just like to stand back sometimes and take a good look at human behaviour — my own included! What, you may ask, has this to do with fishkeeping? A great deal, I would counter — I'm given to such musing in winter months. You might have noticed in my writing that I never separate fishkeeping into a world of its own — as our everyday lives are disrupted by the call of our fish, so our interest must be subjected to our personalities, distractions and experience. And it is my personality, built on experience, that distracts me at times ... and gives rise to question about, the traditions, not only of our own behaviour, but that of our fish.

I mean, take the word 'fish' for instance. We don't speak of trouts, salmon or cods — but we buy kippers. Why don't we ask for 'kipper' I call the inhabitants of my aquaria 'fish' but the encyclopaedias talk of 'fishes'. And when I write, I refer to *Botias*, *Danios*

and *Tetras* — but *Kribonites*? There seem to be no rules.

Then I turn to my books — good books written by people who know far more about fishkeeping than I do. And these books lead to more questions ...

"A densely-planted tank will give fish a feeling of security ...", a statement accompanied by a photo of lush, healthy foliage. My plant hasn't looked like this for years ... New friends peer into the tanks and ask me what I'm keeping in there — which is a fair enough question as all my fish are deep in the plant, feeling secure.

"Give your fish plenty of hiding places ...". No problem — I pile in huge pieces of bogwood, coconut shells, flowerpots and rock. No problem, that is, until I encounter another piece of good advice: "Check to ensure that all your fish are present every day ...". Bearing in mind the third excellent recommendation to disturb your tanks as little as possible, I approach the aquarium. My fish are now deep in the plant, re-decorating the interiors of their caves and clinging to the underside of the bogwood. Roll-call. Forget it.

I like to breed fish and so, when I come across a fish I haven't yet kept, I immediately look up its breeding potential. This is sometimes described quite simply as "easy". Now, I've got a method worked out when it comes to this word. I install the fish in a tank

near the front door and then I put up diversion signs in the road outside, re-directing pedestrians, cars, buses and emergency vehicles through my flat. It works wonders — the fish breed overnight. I think it is the sense of danger that stimulates their desire to leave young of their species behind before they are annihilated. I've come to this conclusion after years of giving my fish quiet, dark places in which to breed — with no success — while the fish in my busy local shops are raising youngsters as if there's no tomorrow.

Which brings me back to where I came in. In the one season of the year when the weather, the days, and nature itself draw in; when every sensible animal finds a warm place to sleep and the most intelligent species on this earth is surprised, yet again, by lack of money, an excess of predictable weather and the time-honoured realisation that their New Year resolutions are about as durable as Christmas paper hats, I am gambling my tomorrow on one greatly underestimated, humble and remarkably cheap commodity — salt.

I am going to use it as my first line of attack when my fish are ill; I am going to spread it on my steps and front drive to postpone the disaster that will undoubtedly befall me when I venture out onto the roads; and, most importantly, I am going to keep a bowl of it on my desk when I refer to anything dealing with fishkeeping ... to make taking a pinch of it more convenient!





# Herpetology matters



By Julian Sims

## Frog hibernation

In 1982, W. D. Schmid identified three species of North American frog which are able to withstand freezing temperatures of  $-6^{\circ}\text{C}$  ( $21^{\circ}\text{F}$ ) for 5 days: the Spring Peeper (*Hyla crucifer*), the Gray Tree Frog (*H. versicolor*) and the Wood Frog (*Rana sylvatica*). Subsequently, a fourth species has been discovered, the Chorus Frog (*Pseudacris triseriata*).

At these low temperatures, approximately 35% of the body fluid freezes. Ice forms in the abdominal cavity and in the arteries and veins around the heart. Ice crystallises over the normally moist skin, the eyes become cloudy and the limbs stiffen.

As some of the water in the frog forms ice, the remaining body fluids become concentrated. This helps to inhibit any more ice from forming because the more concentrated the solution, the lower its freezing point. In addition, these frogs further concentrate their body liquids by the production of an "anti-freeze", glycerol in *H. versicolor*, glucose in the other three species.

The glucose not only prevents more body fluid from freezing, but might even provide a source of energy for the cells of the frozen frog. The blood which would normally transport food to these cells is not circulating.

When environmental tem-

peratures rise, the first sign of normal metabolism returning is the start of the heart beat to pump blood around the body again. Air is gulped into the lungs and gradually the limbs regain flexibility.

These four species which can survive freezing, are exceptional. The majority of North American frogs, including the relatively abundant Northern Leopard Frog (*R. pipiens*), don't produce anti-freeze and can't survive in sub-zero temperatures. The same is true for the Common European Frog (*R. temporaria*).

In the autumn, Common Frogs move towards the ponds where they will spawn in the following spring. Autumn coloration of Common Frogs is a noticeable yellow with contrasting black markings. When they emerge from hibernation, these frogs are much, much darker — very dark green or dark brown.

Many Common Frogs spend the winter in the water of ponds or ditches. During this cold time, when metabolism is slow and the demand for oxygen is reduced, sufficient oxygen to maintain life is usually absorbed through the skin into the underlying blood vessels.

Some Common Frogs overwinter in drier sites, underground, or in dead vegetation.

"Wet" or "dry", neither method of hibernation is without risk to life. For example, during the severe winter of 1981-82 there were two periods of very low temperature. The normal surface ice of ponds formed to a depth far greater than usual. When this ice eventually melted, the bodies of frogs which had died in the mud at the bottom of the ponds floated to the surface.

During the spring of 1982

Vividly marked  
Common Frog in  
autumn, prior to  
hibernation.



fewer frogs which had overwintered on land returned to their usual spawning sites.

In spite of these losses to the adult frog population, severe climatic conditions appear to stimulate those which do survive to produce larger than average quantities of spawn. This is a good example of the fittest animals surviving to pass their characteristics on to subsequent generations.

## Mealworms

Mealworms, the larvae of the beetle *Tenebrio molitor*, are a traditional live, invertebrate food for captive reptiles and amphibians, especially lizards, North American Box Turtles, salamanders and toads. Indeed, for many years one herpetological supplier sold mealworms by the ounce, describing them on his lists as "one of the finest foods available".

Unfortunately, this statement is not totally correct, chemical analysis having revealed that they contain a high percentage of fat. In fact, approximately one-third of a mealworm's body (by weight) is composed of this material which is very difficult to digest completely. The result is that fat accumulates in the body tissues of predators which eat large numbers of mealworms. Such fat deposits cause damage to the liver and can constrict the gut.

A diet of mealworms alone can also give rise to other health problems, especially those related to mineral deficiency. Mealworms normally contain very little calcium, particularly in proportion to another essential mineral, phosphorus. Their calcium to phosphate ratio (Ca:P) is about 1:3. Calcium is necessary for the healthy growth of most vertebrate skeletons, the formation

of eggs (yolk and shell) by female reptiles, and basic biological functions such as the contraction of the heart and other muscles of the body and the maintenance of body fluids at the correct concentration. This last function is known as "buffering".

Yet, even with such potential problems, mealworms do add variety to the diet of reptiles and amphibians. Furthermore, a self-sustaining colony of mealworms in a large biscuit tin (with perforated lid) or tank (with ventilated cover) is a reliable source of live food — particularly in cold weather when other insects are in short supply.

The answer: don't feed too many mealworms to your livestock, too often. Secondly, improve the nutritional content of the mealworms by adding dry COMPLAN (a powdered "bed-time" drink available from supermarkets and chemists), together with a multi-vitamin and mineral mixture (such as VIONATE) to the bran in which they live and feed.

One final note of caution!! Clothes' moths find the bran mix of a mealworm colony an ideal place in which to lay their eggs. To prevent your home from becoming infested with hundreds of small moths, the mealworm colony should be housed in a container with tightly fitting lid, perforated with fine holes for ventilation.

## Books from Blandford

Blandford Press have published two reasonably priced books covering different aspects of herpetology by the author and photographer Chris Mattison.

*Frogs and Toads of the World*, published in 1987, provides a very readable review and is well illustrated with 65 colour and 33 black and white photographs.

*The Care of Reptiles and Amphibians in Captivity* was first published in 1982 and is now available as a 1988 revised edition. This book contains a lot of practical information of value to all herpetologists, whatever their special field of interest.



# Seaview

by Gordon Kay

## Dolphin's cry for help

Readers of the Mail on Sunday newspaper may recall an article on 2 October about a Bottle-Nosed Dolphin who took fishermen in the Mediterranean to his injured mate so that they could help her. For those who didn't see the article, these fishermen were out near Antibes on the French Riviera, when a dolphin came up to the boat, nudged it then swam off.



ATLAS OF MARINE MAMMALS  
Are dolphins capable of asking for help... or is the scientific fraternity correct in urging us not to read too much into their often-humanlike behaviour? (Photograph reproduced with kind permission from T.F.H. Publications).

He continued to do this until the men realised that he wanted them to follow him. The dolphin led them "for several hundred metres" until they came to his mate, whose dorsal fin was torn almost completely off.

Sadly, they could see that she was already dead — although the male didn't seem to accept this and continued to swim around her, trying to get her moving again. The fishermen watched this for some time, realised that there was nothing they could do and left.

This touched the men somewhat and one eminent scientist was quoted as saying that it is very possible that the dolphin was asking for help, although it is more usual for dolphins to help man. However, the consensus of scientific opinion seemed to be that we should not read too much into the incident nor bestow human

emotion onto dolphins.

Personally, I can't for the life of me see how anyone can deny the fact that this dolphin — obviously distressed — went searching specifically for someone he thought could help. Am I becoming too sentimental — with silly romantic notions — or is science growing more cynical with increasing knowledge?

## So-so Aquarium Reef Book

With the increasing popularity of miniature reef aquarium systems throughout the world, it was only a matter of time before there appeared a book dedicated to the subject.

I've just finished reading such a work, called *The Marine Fish and Invert Reef Aquarium* by Albert J. Thiel and have to admit that I don't really know what to think about it. Everything you would want to know about the 'nuts and bolts' of such a system is there, but the writer makes so many assumptions that only aquarists with plenty of experience would be able to gain much from the book.

Some manufacturers have been known to claim that, with their product, all that's needed is a plug and water. Most of us know that successful long-term maintenance of any system needs more attention than this, but human nature being what it is, some people want to hear things like that. They want something that will make them aquarists overnight.

If nothing else, this book hammers home the fact that statements like that are nonsense. From a presentation aspect, I thought the book was rather poor. I found it heavy going (I always say that learning should be fun!) and the number of misprints is untrue. However, there is a lot of knowledge in the book and anyone who is considering buying or building such a system really should read it, purely because it is the only work available on the miniature reef system. I just can't help thinking, though, that, if this book had some quality opposition, it would not do very well.

## Voluntary Conservation Areas

Some very interesting stuff in the *Marine Conservation Society's* autumn journal. Particularly pleasing was the news of a new Voluntary Conservation Area on the mouth of the Helford River. The site was officially opened on 28 July by Tony Soper and its aim is "to achieve, by voluntary means, the harmonious use of the river and to monitor the quality of the marine environment".

There was also news that other such sites were flourishing. Summer Wardens had been on site since late June, with Wembury doing so well that the warden's stint was prolonged until the end of September, and Lulworth Cove in Dorset being so popular that there is now a permanent aquarium and display showing the marine life in the area.

There was also news of the opening of an Underwater Nature Trail, at the Purbeck Marine Nature Reserve. Apparently, after diving along the nature trail, one can even sign the underwater visitor's book!

## SNIPPETS

1. A Tsunami (or Seismic Sea Wave) is a cataclysmic wave generated by undersea earthquakes or volcanic eruptions. A Tsunami can travel across a whole ocean at up to 450mph (c725Kph). The wave crests can be 100 miles (160Km) apart, with the interval between each one being more than 15 minutes.

2. The Cranchid group of deep-water squid are able to hover in mid-water by means of an ammonia-filled gland with which they maintain neutral buoyancy.

3. The infamous Crown of Thorns starfish (*Acanthaster planci*) can measure 16in (c40cm) across and a single animal can consume 16sq ins (103sq cm) of coral a day. As many as nine individuals per square yard (0.8sq m) have been recorded.

4. Sponges are sessile animals with a different inner and outer layer of cells. They filter feed by ciliary action, whereby water flows in through numerous

pores and out again via a common opening. Food particles are collected by the current-producing cells themselves.

5. Although *Forcipiger longirostris* is commonly called the Yellow Longnosed Butterfly, there is a rarely-occurring black form of this species. Most recorded observations were on the Kona coast of Hawaii, although it has been seen on the Great Barrier Reef and off Christmas Island in the Indian Ocean. It was reported that approximately one black individual occurs for every one hundred yellow ones. Intermediate varieties have also been seen and, apparently, black Forcipigers kept in captivity revert to the normal yellow. It's very strange (to me at any rate) that there are no black variations in *Forcipiger flavissimus* — unless you know different...

6. Elements dissolved in seawater in minute quantities are called trace elements, some of which have been shown to be of great biological importance. The concentration of these elements is so low that their presence is next to impossible to discern chemically. However, certain organisms are capable of filtering out these minute quantities and storing them within their body tissues. For instance, the alga *Fucus spiralis* contains 1000 times as much nickel as does its environment.

7. Because of its high content of other dissolved substances, seawater is less efficient at absorbing oxygen than freshwater. At 68°F (20°C), for example, it can dissolve only 5.35 cc per litre, compared to freshwater, which can dissolve 6.57cc per litre. This oxygen-dissolving capacity reduces still further with increased temperature. At 86°F (30°C) seawater contains only 4.50cc per litre.

8. From the "Department of Staggering Statistics" comes this message. Did you know that every year the inhabitants of Blackpool's Tower Aquarium gobble their way through 6,556lb of fresh white fillet of fish, 2,334lb of Herring, 14,561lb of squid, 500lb of shrimps, 200lb of beef heart, 200lb of flake food and 2400 heads of lettuce? And I thought I could eat...

Until the next time...



# THE POND IN WINTER

Alan Watson shatters a few myths concerning commonly held beliefs about freezing water and offers sensible advice on the use of that great aid to winter survival — the floating pond heater.

**W**ith the onset of winter it is time to consider the effects of sub-zero temperatures on garden ponds and dispel some of the misunderstandings concerning the freezing of water.

It may seem surprising that even in the Arctic rivers and lakes do not freeze solid but acquire only a crust of ice — unless, that is, such expanses of water are relatively shallow. In Britain's climate it is almost impossible for any sunken garden pond deeper than seven inches (c. 18cm) to freeze solid and, in any sunken pool of any depth, it would be extremely rare for ice to reach six inches (15cm) in thickness. This does not necessarily apply to raised or semi-raised pools, however, because the rate of heat conduction through retaining walls will depend on the type of construction and materials used. If good solid masonry with cavity insulation is employed to give a satisfactorily low incidence of thermal conductivity, they can be expected to behave much like a sunken pool, except during an extended period of continuous sub-zero temperatures, when a thicker crust of ice may form.

## Behaviour of freezing water

This resistance to freezing is due to the remarkable behaviour of water at low temperature.

Water reacts like almost all other materials on earth for all changes in temperature from 100°C to 4°C (212-39.2°F): it expands and becomes lighter as temperature rises, and contracts and becomes heavier as temperature falls.

At 4°C (39.2°F) something unusual happens to water. As cooling continues, water starts to expand and become lighter. This characteristic has a dramatic effect, as will be explained. As water freezes, however, an even more extraordinary change occurs. Quite rapidly, the freezing water expands by 9%, forming ice which, being so much lighter, floats on top of unfrozen water. This is quite unlike nearly all other substances on earth where the change from liquid to solid normally produces a heavier form of the material.

Consider, then, what happens to pond water in winter as the temperature falls to zero or below during a cold spell.

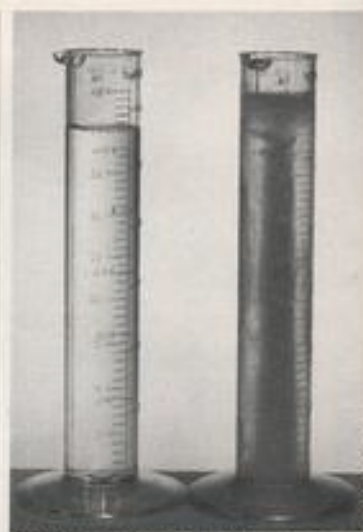
As the surface water cools and grows heavier it sinks and warmer water rises to

take its place. This process of convection continues until all the water in the pond reaches 4°C whereupon convection ceases. Surface water continues to cool but, because it now starts to become lighter, it remains as a cold layer floating above the bulk of the water in the pond.

The surface water may now freeze. Yet, no matter how severe the winter conditions become, the bulk of the water below the ice will not get any cooler than 4°C. However much we, ourselves, may suffer and endure the miseries of ice and snow in severe winter conditions, our fish and other pond life will remain insulated from it all in a world of water that never gets colder than 4°C. This is why our coldwater fish, frogs and other forms of pond life survive the worst of winters, albeit in a state of dormancy.

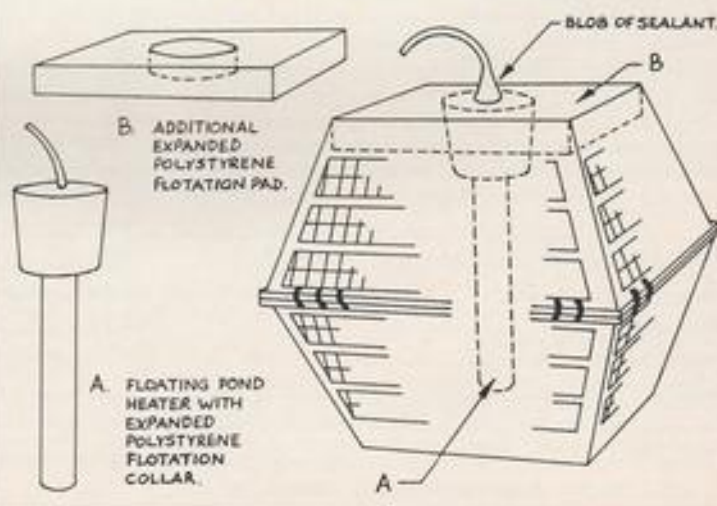
## Exaggerated fear

There is in many people's minds an exaggerated fear of ice due to the mistaken belief that the very act of freezing causes damage to pipes, tanks, pond walls, etc. This is not the case. The formation of ice will only cause damage where water becomes trapped and unable to expand freely. In any open vessel, pond or pipework, where water



Both these measuring cylinders started off containing 40ml of water. However, as the water froze in one of them the volume increased to 45ml.

## Adapting a floating pond heater for safe winter use





is free to move, the expansion of water on freezing will always take place in the direction of least resistance to movement. In a pond this is upward, and no pressure will be exerted on the sides or retaining walls of the pond.

This is demonstrated in the photograph of two measuring flasks. The one on the left contains 40ml of water at room temperature, while the right hand flask contains the same amount of water but which has been frozen, and has expanded to about 45ml. The expansion is entirely upwards and has done no damage to the flask.

It will be seen, therefore, that contrary to a widely held belief, it is not, in my opinion, necessary to float blocks of wood, rubber balls, or plastic bottles in a pond to protect the sides from damage due to freezing. The only purpose served by such floating objects is to enable them to be removed from the ice with the aid of hot water so as to leave a hole through which air may enter to freshen the water.

### Pond heaters

Although not essential, it is nevertheless a good thing to free an area of pond from ice occasionally during a prolonged spell of sub-zero temperatures to allow access of oxygen and escape of toxic gases. This is best done, where practicable, with a floating pond heater.

The usual pond heater comprising a heater element with a flotation collar of expanded polystyrene can have certain disadvantages though. Unless enclosed in some

way it will drift with the wind and may come into direct contact with pond liners. This might cause damage, as the surface temperature of the heater element is very high. Another possible disadvantage that I can see is that the water close to the heater becomes quite warm so that if fish congregate too close and then swim off to much colder water, they could suffer severe stress caused by the shock of such a sudden great change in temperature.

An easy way to overcome this problem is illustrated in the accompanying figure showing how a floating heater can be fitted into a protective housing using two medium size planting crates (suitable for heaters up to 7 inches (c 18cm) overall length), a piece of expanded polystyrene, some nylon cord or plastic-covered wire and a little adhesive.

First drill a small hole in the centre of the bottom of one of the planting crates of a size to suit the diameter of the electric cable connected to the standard heater unit. Next cut a piece of expanded polystyrene to fit the bottom panel of the crate (usually 6 x 6in — 15 x 15cm) with a hole in its centre to accommodate the flotation collar of the heater unit. The polystyrene should be 1 to 1½ inches thick (2.5-3.8cm). Fix this piece of polystyrene to the inside bottom of the planting crate using a suitable adhesive. Pass the heater cable through the drilled hole and fit the heater flotation collar into the hole in the piece of polystyrene, fixing it with adhesive. Apply a blob of sealant where the cable emerges from the bottom of

the planting crate (or use a cable gland if you want to be more professional). Larger planting crates can be used for larger heaters.

When the adhesive has hardened, invert the planting crate and place on top of the second crate as in the sketch, binding the two crates together with rot-proof nylon cord or plastic covered wire. Do not cement the crates together with adhesive because they will need to be taken apart for cleaning.

The completed heater housing will now float, keeping fish at a safe distance and eliminating all risk of damage through contact with liners or anything else in the pond.

It is not necessary to leave the heater switched on continuously except, perhaps, during prolonged spells of exceptionally cold weather. Normally it is sufficient to switch it on occasionally to clear the area around it of ice and allow oxygen access to the water. If the heater unit is left on continuously it will encourage unseasonal growth of algae and may entice fish from their normal cold weather dormancy.

It must be said in conclusion that, under all normal circumstances, it is not necessary to worry about the freezing of sunken pools in winter, provided they are in a healthy condition and not overstocked. With water temperature not above 4°C-39.2°F (ideal conditions for refrigeration) nearly all life will be in a state of dormancy. There will be a very low demand for oxygen, gas-producing organisms will be inactive and very little carbon dioxide will be formed.

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# OUT AND ABOUT

## Tetra's latest resounding success

Last 19 November a one-day Symposium was held on 'The Diagnosis and Control of Tropical Fish Diseases' at the University of Liverpool's Department of Continuing Education. The course was jointly organised by Tetra's Dr David Pool and Liverpool University's Dr John Manning. Tetra also funded part of the admission charges, so the fee was only £6, or £4 for Seniors, and £1.75 for unemployed.

97 people, from as far afield as Northern Ireland and London, attended the event, which filled the Science Block Lecture room to capacity. In the reception area was a display of small tanks holding diseased fishes and microscopes with slides of parasites such as White Spot and Costia. In addition, there was a Tetra stand showing their extensive range of products, with free leaflets from the Tetra Information Centre. Eric Goodwin, Tetra's North West Area Representative, was also on hand to answer questions on the Tetra Information stand. Free tea and coffee was available too.

The session started with a lecture from Dick Mills, the well-known author of aquatic books, regular *A & P* contributor, and committee member of the FBAS. He stressed the importance of correct husbandry to prevent disease problems occurring. Some useful tips were given too e.g. white or even pale gravel may stress a fish with dark colours for camouflage; beware of vibrations from a Hi-Fi unit sited next to the tank; Yellow Tetras are listed as peaceful fish but they can be fin nippers; under-gravel filter units make good tank dividers, and reverse flow filters are ideal for feeding filter-feeder invertebrates.

Dr David Pool, of the Tetra Information Centre, followed with a lecture on disease diagnosis, including a post-mortem examination of a trout (he explained that the usual tropical fish would be too small to see). This was videoed, with two VDU's displaying the procedure to the audience.



Dr David Pool in deep discussion with a group of very interested aquarists immediately after his successful dissection demonstration.

Dr Jimmy Chubb, Head of the Department of Environmental and Evolutionary Biology at the University, then gave a lecture on parasitology, reviewing both direct and indirect parasites of fish.

Dr Pool gave the final lecture with descriptions of treatment including anaesthesia, immersion therapy, medicated feeds, stomach tube and injection methods. Again, useful tips were given, such as the

ideal anaesthetic level was 5g/10 litres MS222, but half this level for Benzocaine. Antibiotics can be added to pellet foods by mixing with corn oil and cool-oven drying. A full 10 days' treatment was essential for antibiotics to prove effective, and debris must be removed from filters, as well as the carbon, to prevent biological material reducing the effectiveness of antibiotic or chemotherapy.

The full day ended with a lively question-and-answer session. Well done Liverpool University and Tetra. We, at *A & P*, hope to see more of these Symposia, and have, in fact, heard that Tetra are already planning similar events to be held in other areas of the country.

Watch this space for further details in due course!

## Festival cheers to Interpet

Aquatic equipment manufacturer and supplier Interpet took a bold step into the world of exhibitions by staging a "show with a difference" at Brighton Corn Exchange at the end of October.

Around 3,000 visitors attended the one-day event, staged in conjunction with Mid-Sussex Aquarists Society and designed as a major educational aquatic festival. Top names and personalities of the aquatic hobby assembled to provide visitors with demonstrations, talks, help and advice.

In addition, the festival formed the venue for the annual open show of Mid-Sussex AS as well as for the Federation of British Aquarist Societies' (FBAS) Supreme Championship Show — the culmination of the years' FBAS show calendar when fish qualifying from regional shows throughout the country compete for the accolade of Supreme Champion 1988.

This year's FBAS Supreme Champion was Andy Feast, of Mid-Sussex Aquarist Society, with a superb *Boria rathbunae*. Andy was a member of the



Andy Feast, of the Mid-Sussex Aquarist Society, was the outright winner of the "Ultimate Best Fish" award sponsored by Philips Yeast Products Ltd.

former Tonbridge AS and his award is the culmination of over 20 years' involvement with the hobby.

### Trend

The festival provided a welcome relief from the current trend of aquatic exhibitions with their gamut of trade stands



Every part of the exhibition (this is part of the competitive section) attracted crowds of interested visitors.

frantically attempting to clear as many products/livestock as possible.

Full marks to Interpet for their boldness in staging the event. From the amount of interest it has aroused it is hoped that the Brighton Festival of Fishkeeping will become an annual highlight in the fish-keeping calendar.



## OUT AND ABOUT



Les Melling receives his award for the best article of the year from Tetra's Dr David Pool.



Dr Peter Miller of Bristol University gave a superb lecture on gobies which was every bit as entertaining as it was informative.

### 1988 BMAA AGM/Seminar — London Zoo Sponsored by Aquarist and Pondkeeper

Report by:  
Gordon Kay  
(Chairman BMAA)

Sunday, 23 October saw the BMAA's AGM/Seminar, held at London Zoo and kindly sponsored by *A & P*. This is the second event to be held in such surroundings and many felt that it was better than the first, which was held at Bristol Zoo in May. The size of the audience would seem to bear witness to this belief.

The day started with the AGM, which gave everyone the opportunity to express their views on the running of the society. There was no shortage of takers and, indeed, the meeting ran over by 45 minutes. The seminar proper started with a lecture by Dr. Chris Andrews, who is the Zoo Aquarium's Assistant Curator. Chris's very interesting talk was about the role of Zoos in the conservation of marine organisms.

After lunch came a lecture by Dr. Jennifer George, who is a prominent member of the Marine Conservation Society and who, along with husband David, wrote the definitive book on Marine Invertebrates. Dr. George's talk illustrated the various feeding techniques of many such animals and provided food for thought on their conservation.

Dr. David Pool, of Tetra, gave the next lecture — this time on the behaviour of fishes. David is a very knowledgeable speaker with the ability to convey sometimes complex information in such a way as to make it both understandable and interesting for everyone. After his talk, David agreed to present some trophies and draw the winning tickets in the raffle.

The award for the best article of the year was won by Les Melling for the second year running, and the award for the member of the year went to Dave Garratt. Regular readers of *A & P* will be familiar with Dave and his excellent articles and his award, given in respect of his work on the problem page in the society's journal, *Marine*, was no more than he deserved.

The raffle over and all the prizes given, everyone refreshed themselves with coffee and settled down for the final lecture of the day by Dr. Peter Miller of Bristol University. Dr. Miller gave a wonderful talk on the fishes of the Goby family and made such a seemingly unexciting topic so enthralling that the audience were left wanting more.

And so, all too soon, it was time to pull the curtain down on another year. Chris Andrews took most of the members on a tour of the aquarium, leaving the committee and *A & P* staff to pack away feeling satisfied with a very successful day.

## News from the societies

### International Cichlid Conference Update

Presented by: American Cichlid Association (10-13 August, 1989, Orlando, Florida). The latest news from A.C.A. regarding their international cichlid extravaganza includes the most recent list of speakers who have, so far, been firmly booked for the event. In addition to Ad Konings, Heiko Bleher and David Ford mentioned in the last update, others include Rainer Stawikowski, Tony Ribbink, Walter Dieckhoff, Marshal Meyers, Harry Grier (seen his superb photos in *A & P* recently — including this month's Spotlight?), Jack Gratzek, Ruth Francis-Floyd, George Klontz and Gunther Ritter.

To quote from the latest A.C.A. press release:

*"We're set to hold the event at the Orlando Hyatt which is the ideal spot for the ICC. Not only is the location hard to beat, being just a couple of miles from the Disney World/Epcot entrance, but it is also right in the middle of the biggest tourist area in the world! Their own facilities, set in 46 acres, are absolutely top-notch for both our event, and also for family vacations. It (the Hyatt) is truly luxurious, with four swimming pools, playgrounds, tennis courts, jogging trails, three restaurants and a convenience store. For the ICC, the Hyatt has significantly reduced room rates to \$68/double (2 queen beds — 4 people) which is exceptional value. This rate is available, not only during the conference, but for a few days before and after the event.*

*Nothing like this has ever happened in our hobby, and we're inviting you to come and enjoy what promises to be an unforgettable event. Wherever the ICC has been mentioned it has generated tremendous enthusiasm and response. Even though we have planned for a large crowd, you are urged to start making your plans now to attend."*

For further information, including show and auction details, write to: International Cichlid Conference, 419-A Hidden Brook Drive, Glen Burnie, MD 21061, U.S.A.

### Mid-Sussex Aquarists Society

The M-S.A.S. held their Open Show in conjunction with the Interpet-sponsored Brighton Festival of Fishkeeping held at the Brighton Corn Exchange on 30 October (see *Out and About* for further details of the Festival).

The Open Show (like the Festival) was a huge success, with 446 entries of a very high standard. The top awards were as follows:

**Best Fish in Show and Best Exhibit:** *Cichlasoma cyanoguttatum* owned by Mark Jeeves

**FBAS Championship Class CA:** *Hemigrammus ulreyi* owned by A. I. Brunnell

A further distinction won by Mid-Sussex was the award of **FBAS Supreme Champion** won by Andy Feast with a superb *Betta splendens*.

**M-S.A.S. Information:** Meetings held at Burgess Hill Football Club, Leylands Park, Burgess Hill, Sussex, on 2nd and 4th Thursdays of each month, starting at 8.00 p.m. The first of these meetings usually consists of a Table Show followed by club business and a social evening. The second one usually takes the form of a major lecture by a well-known figure in the hobby.

Further details from the Secretary, Bill Slade, 6 St Andrews Road, Burgess Hill, West Sussex. Tel. (04446) 2347.

## Diary date

### Redcar Fishkeepers' Society.

The provisional date for the 1989 Open Show of the above society is **28 May**. For further details contact the R.F.S. Secretary, R. Lacey, at 14 Lockwood Court, Bankfields, Eston, Cleveland.



## Spotlight on

# Livebearers

# SWORDTAILS AND PLATIES

Swordtails and Platies are, deservedly, among the most popular of all aquarium fishes. Yet, today's stocks are so far removed from their ancestral types that it is often difficult to know where Swordtails end and Platies begin. *A & P* editor **John Dawes** investigates.

(Photograph: Harry Grier/Florida Tropical Fish Farms Association).

**H**ave you ever gone to a shop, looked into a tank of bustling Red Platies and wondered whether you are looking at elongated Platies or swordless Swordtails? Of course you have. And what's more, the more often you look, the more often this somewhat confusing state of affairs will be likely to be staring back at you as commercial breeding programmes continue to expand.

Take the fish in our spectacular Spotlight photograph, for example. Would you call it a Platy or a Swordtail? Its "official" name is a Sword Tail Rainbow Variatus. It was produced in Florida by Ruskin Tropicals and it won first place in the Fancy Platies and Variatus Class at the last F.T.F.F.A. show which I reported on in the June '88 issue of *A & P*.

According to its name, this fish is currently being regarded as a Platy but, in my opinion, it could just as easily pass as a Swordtail. Either way, it's quite a fish.

The reason why such confusion is possible in the first place is that Swordtails and Platies are very closely related to each other. They belong to the genus *Xiphophorus* and, because of their 'biological proximity', can interbreed with the greatest of ease... and produce viable hybrids in the process.

### Exploitation

Such a state of affairs lends itself perfectly to exploitation, particularly when the original species themselves are highly variable in any case. The inevitable result of all this is that Swordtails and Platies are now available in a mind-boggling array of fin and colour configurations. This is, of course, good news for those aquarists who are always on the lookout for something novel. It's also good news for the hobby as a whole since the presence of colourful, spectacular, hardy fish in dealers' tanks is one of the best ways

of sparking off interest in aquarium keeping.

So, long may today's Platies/Swords reign. However, we mustn't forget that these colourful, over-finned, delightful mutants are descended from *real* species, all three of which can, fortunately, be found in abundance in the wild. For the record, therefore, here are some basic details on the *true* Swordtail (*Xiphophorus helleri*) and the two *true* species of Platy (*X. maculatus* and *X. variatus*) from which all our present aquarium stocks are descended.

### Swordtail

**Common Name:** Swordtail.

**Scientific Name:** *Xiphophorus helleri*.

**Geographical Distribution:** Atlantic coast of Mexico and northern Central America.

**Size:** Females are generally larger than males, reaching around 12cm (4.7in) in spacious aquaria. Males (excluding the sword) grow to around 18cm (4in).

**Water Preferences:** Slightly alkaline, medium-hard water is best but a range of water conditions will be tolerated, as long as they are neither too soft nor too acid. Suitable temperature: around 24°C (75°F).

**Diet:** Swordtails will accept a wide range of foods which should include an animal-based component.

**Additional Information:** Swordtails have received a great deal of attention, not unlike the Guppy, both from hobbyists and scientists, since they were first introduced into the hobby in 1909. The result, again as in Guppies, has been a proliferation of colour and fin types, some of which would stand little or no chance of survival in the wild.

One significant difference in the Swordtail story is that it hybridises easily with its close relatives, the 'normal' Platy (*X. maculatus*) and the Sunset or Variatus Platy (*X. variatus*), themselves the subjects of extensive artificial selection programmes. This has been done so often, and in so many

combinations, that many (the majority?) of today's Swordtails are not pure *X. helleri*.

It is probably true to say that, nowadays, pure *X. helleri* Swordtails only occur either in the wild or in the tanks of specialist hobbyists. Further, even pure Swordtails, themselves, are difficult if not impossible to describe because there are several isolated, but distinctive populations of the species, some even containing spotted or red individuals.

The nearest the aquarium hobby ever comes to true, wild-type Swords is the short-finned, green variety, from which many others have been developed. Hi-fins, Lyretails, Reds, Wagtails, Tuxedos, Marigold, Albinos, Pineapple, Red-eye Reds and numerous others are regularly available and will make colourful, and generally hardy, additions to the tropical aquarium.

Male Swordtails are often aggressive towards each other, but this can be minimised by keeping several (rather than just two) specimens in the same tank.

### Platy

**Common Name:** Platy.

**Scientific Name:** *Xiphophorus maculatus*.

**Geographical Distribution:** From Vera Cruz in Mexico to Belize and Guatemala.

**Size:** Cultivated forms are, generally, larger than wild-caught specimens, females measuring around 6cm (2.5in), males 3.5cm (1.5in).

**Water preferences:** Neutral or slightly alkaline water conditions at around 24°C (75°F) are preferred but some deviation from this will also be tolerated.

**Diet:** Platies will accept a wide range of foods which should include a vegetable component.

**Additional Information:** There are quite a few naturally-occurring forms of this species. In particular, the population from the Rio Papaloapan in Mexico, is very







# Spotlight on *Livebearers*

indeed with the males possessing an almost black body, speckled dorsal fin, clear caudal and pectorals, whitish pelvics and brilliant orange/red anal fin (gonopodium).

Other varieties found in the wild include the following:

**Blue:** Bluish tinged body with a blue mark on each 'shoulder'.

**Comet:** Some individuals have black upper and lower edges to the caudal fin.

**Crescent:** Black crescent markings at the base of the caudal fin.

**Moon:** 'Full-moon' black markings on the base of the caudal fin.

**Nigra:** Black lower part of body and black tipped gonopodium.

**Pulehra:** Black-spotted body with a rust brown caudal peduncle (where tail joins body).

**Rubra:** Red bodied males with black spots.

The inherent variability which *X. maculatus* exhibits, added to the ease with which it hybridises with its near relatives, the Swordtail (*X. helleri*), and the Sunset or Variatus Platy (*X. variatus*), has led to numerous artificially-produced varieties of the 'Common' Platy.

*X. maculatus* can be relatively easily distinguished from *X. variatus*, despite any additions of fancy finnage or colours which

may have occurred. *X. maculatus* has a rather stumpy body, while *X. variatus* is more 'Swordtail-shaped' (minus the sword, of course). In addition, *X. variatus* usually carries a series of vertical bars on the sides of the body. These characteristics, obviously, apply only to individuals of pure *maculatus* and *variatus* parentage. Where they have been hybridised, intermediate characteristics occur and distinguishing criteria become blurred.

## Sunset/Variatus

**Common Names:** Sunset or Variatus Platy.  
**Scientific Name:** *Xiphophorus variatus*.  
**Geographical Distribution:** Atlantic slope of Mexico.

**Size:** As in *X. maculatus*, aquarium varieties are usually larger than those occurring in the wild; females, around 7cm (2.75in); males about 5.5cm (2.2in).

**Water Preferences:** Neutral or slightly alkaline water at around 24°C (75°F) is preferred but a range of conditions will be tolerated.

**Diet:** A wide range of foods will be accepted; a vegetable component should be provided on a regular basis.

**Additional Information:** *X. variatus*, despite its name, is not as varied a species as *X.*

*maculatus*, the 'common' Platy. Several natural populations do, however, exist, the most attractive probably being that from the Rio Axtla which is closest in appearance to the more 'basic' of the cultivated varieties.

Two other fish which were formerly believed to be subspecies of *X. variatus* (namely *X. variatus xiphidium* and *X. variatus evelynae*) are now considered to be valid species in their own right — *X. xiphidium* and *X. evelynae*, respectively. Naturally occurring hybrids reportedly exist between *X. variatus* and *X. xiphidium* (*X. 'hossanderi'* from the Rio Soto La Marina) and *X. variatus* and *X. couchianus* (*X. 'roseni'*).

This natural tendency towards hybridisation, as well as the species' considerable inherent genetic variability, have both been exploited by commercial breeders to produce the large, high-finned and colourful varieties of the Sunset Platy which are so common nowadays and which have virtually eliminated the more basic but (in my opinion) nonetheless spectacularly beautiful wild forms.

**NOTE:** Text partly taken from: *A Practical Guide to Keeping Freshwater Aquarium Fishes* by John Dawes, Published by Hamlyn. ISBN 0 600 55183 0.

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# Spotlight on *Livebearers*

## BRAZILIAN SURPRISE

Dennis Barrett of Belton Fish Farm (and Official Photographer of S.L.A.G.) introduces a small and attractive South American livebearer recently shipped into the UK among a selection of Brazilian Tetras.

Recently, Belton Fish Farm had a fish shipment from Brazil in which there were two boxes of Ruby Tetras (*Hyphessobrycon amandae*); about 3,000 in all. While I was putting the Ruby Tets into the tank allocated for them, I noticed that there was a small number of livebearers mixed in with them. I didn't take much notice at the time due to the (insignificant!) fact that it was 11 o'clock at night and we had forty more boxes to tank before going home!

Friday mornings we start work at the unearthly hour of 6.30am. My first stop in the fish house that morning was, not surprisingly, at the tank containing the Ruby Tets, mainly to have a closer look at the livebearers. I could make out about five, maybe six, in the first tank; then in the second tank, about another twelve.

At this point I had no idea what they were, only that they weren't *Gambusia affinis holbrooki*. The reason that I mention "Holbrooki" is that we do get a lot in with different fish quite often. The size of the

new livebearers was about 1.5cm, and they had sexed out, although no real colour was showing.

I took all eighteen of them home and placed them in a 15 x 10 x 12in (38 x 25 x 30cm), well-planted tank and just waited for them to grow and colour up.

### Spawning success

About two weeks later, two of the males began to show colour and the females began to show signs of being gravid (pregnant). I therefore took four females out of the main tank and placed them into breeding traps. (I didn't want to take the chance of the females eating the fry).

After another week had passed by I came home one night to find one of the females had dropped fry. There were only two, and they were so small that I could have done with a magnifying glass to see them. It wasn't long after that the other females gave birth and I ended up with quite a collection of fry. The largest number of fry that I've

had from one female is thirteen, but the norm is seven or eight.

At about the same time as this, Ivan Dibble, one of the UK's leading livebearer hobbyists, Ivan Dibble was going to Germany to the D.G.L.Z. meeting (the German Livebearer Society). He rang me to ask if I would let him have a pair of the new fish for himself, plus a further pair for Manfred Meyer who is based at the University of Frankfurt and is responsible for naming numerous fish. I obviously agreed to this and sent him two pairs through the post, just before his departure to Germany (they arrived intact).

### Species identified

On his return Ivan rang me to say that Manfred had identified the fish as *Poecilia scalpridens*. I knew they had been in the country before, but in very limited supply. Further, breeding of this species had proved very difficult, so, therefore, none of them were ever passed around. Now, however, I am pleased to say that I have let about ten pairs out to different people in various parts of the country and still have a stock of forty to fifty left (mostly fry).

### Aquarium care

I keep my fish in a well-planted tank with lots of aeration at a temperature of 75°-80°F (24-27°C) and a pH of 7.5. I have some floating plant in as well, so if I do miss any of the females (ie — not remove them to a trap at the right time) some of the fry will survive.

The food I give is, mainly live, but *Poecilia scalpridens* will also take dried food. I use food similar to Promin; high protein and very fine, almost like powder. The fry are fed on freshly hatched Brine Shrimp twice a day, but the adults only once. When the young fish reach maturity the males are 2.0cm (c0.8in) and the females 2.3-2.5cm (c0.9-1in) in length.

Both sexes are basic olive green in colour, with a dark lateral line. The male's dorsal fin has a black crescent at the base, then a yellow crescent in the middle, followed by black crescent on the outer edge. The rest of the fins are clear. On the female all of the fins are clear.

Although this attractive livebearer is not yet available in large numbers, it can nevertheless be obtained by members of the Southern Livebearers Aquatic Group through the "internal" exchange arrangements which exist within the Association.

For further details contact: **John Corbett** Secretary/Treasurer, 26 Durban Road, Liverpool L13 5SY.



Above: An adult pair of *Poecilia scalpridens* (female in front).

Right: An excellently coloured *P. scalpridens* male.





# Spotlight on *Livebearers*

## A WALK ON THE WILD SIDE

First  
STEPS

If you've already gone through the early stages of aquariumkeeping, then you will, no doubt, have kept some of the common cultivated livebearers. Taking your first steps into the world of "wild" livebearers could well be the next priority on your list. If so, then **Derek Lambert** of the Livebearer Information Service has a few expert suggestions.

**L**ivebearers form one of the most diverse groups of fish kept in the aquarium today, ranging from some of the largest fish in the world (Sharks) to some of the smallest (Poeciliidae). They are found in all the seas of the world as well as in many of the freshwater habitats. Of the more than 1000 species which exhibit viviparity only a very small proportion have been kept in aquaria.

The livebearers which we keep in aquaria are, in general, pretty tolerant to most

aquarium conditions. Many species will live and breed in nothing more than a bare tank with clean water and plenty of live food, clean water being the operative phrase here. Without filtration or regular water changes (a minimum of 50% every two weeks) the fish will start to show signs of stress in little more than three weeks. While this sort of set-up works very well for a commercial establishment it does nothing to enhance your living room!

The classic furnished aquarium with living

plants, rockwork or bogwood and weekly partial (10%) water changes, seems to be paradise for most livebearers. If you adhere to the old formula of 8sq ins of surface area per inch (c415sq cm/2.5cm) of fish and have plenty of growing plants in the aquarium, filtration will not be required, as you establish a balanced aquarium.

Many of the older aquarium books talk about the balance in an aquarium but, often, with the more recently written books, this has been ignored in favour of the new super-duper filters. While I don't doubt that they do their job, I still feel that, with care, it is possible to use much more attractive living plants instead. Plants are also a source of much needed vegetable matter in your fishes' diet and provide refuge for both the fry and more timid inhabitants of the aquarium.

Each species will have its own optimum temperature but most will adapt to 75°F (24°C) and still breed. Similarly each species will have its own "perfect" diet (i.e. what it would eat in the wild). However, most will live on whatever is thrown in the tank. This having been said, breeding livebearers requires a great deal more attention than just

Bottom left, *Ataniobius toweri* — a truly wild and richly rewarding Goodeid livebearer from Mexico. Bottom right, the Red Rainbow Goodeid (*Characodon lateralis*) is a colourful, but generally timid, species suitable for some "wild livebearer" communities. Below, left, *Girardinus metallicus* — one of the oldest "wild" species of livebearer kept by aquarists. Below right, *Scolichthys greenwayi* is a good choice for any community tank housing small fish.







Green Sailfin Mollies, despite their popularity and obvious "commercial" heritage, are nonetheless still pretty close to their wild-type ancestors.

dumping a pinch of flake food in the tank each day. Regular feeds of live food are essential for pregnant females to produce good quality fry. It is very much a case of only getting out what you put in.

Another good source of food is your own plate; anything (not spiced!) that you eat, a fish will eat. So, if you liquidise the leftovers into a thick paste and feed this to your fish, a good balanced diet will be achieved at very little expense. Extreme care should be taken with this though, as it is easy to pollute the tank with uneaten food. The rule here is — no more than the fish will eat in five minutes.

### Wild Selection

Turning now to the fish for your community tank. All the usual rules about fish in a community tank apply with livebearers. It is a well known fact that big fish eat little fish. A 4in (10cm) long Red Harlequin Halfbeak (*Normohamphus liemi liemi*) will eat a 1in (2cm) long male Mosquito fish (*Heterandria formosa*). Some carnivorous species such as the Pike Livebearer (*Belontiopsis belontiopsis*), will eat a fish half its own size and look round for seconds! However, the majority of aquarium livebearers fall in the 2-4in (5-10cm) category and, apart from the odd nipped fin, are not inclined to be aggressive. Since this leaves nearly 100 species suitable for a community tank I have chosen eight of my favourite species.

*Xiphophorus cortezi* is one of the medium sized wild swordtails which has enjoyed a steady popularity among livebearer keepers since its introduction to the hobby in 1974. While this species lacks the gaudy colours of its cultivated cousins it still has much to recommend it. Males reach a size of 2½in (6.4cm) and females about 2in (5cm). The sword is short, only reaching about half the body length on most strains. Broods are born at monthly intervals with an average of 30 fry in the brood. The largest brood on record is 76 from a single isolated female.

*Scolichthys greenwayi* is a species which does well in a community of small fish. The males achieve a size of only 1½in (3.8cm) while the females usually reach 2in

(5cm). Both sexes are similarly coloured with a black spot on the side and the most beautiful blue sheen on the belly. The fins are edged in electric blue. While a peaceful species, this is a busy active fish which spends most of its time out and about in the mid-water regions of the tank. Broods are born monthly and can be as large as thirty.

*Girardinus metallicus* is one of the oldest species of wild livebearer to be kept in the aquarium. Larger than the previous species reaching 2in (5cm) on the male and 2½in (7cm) on the female it is still, nonetheless, a peaceful fish which will fit in with other small species. The gold flashes down the sides really stand out in daylight and, when young, the eyes gleam an iridescent blue. Males of some strains exhibit a dark stripe from the tip of the bottom lip along the belly to the end of the gonopodium. This is a mid-water species which, unless frightened, will be seen out and about all the time. Broods are born at monthly intervals and can be as large as fifty.

The Red Rainbow Goodeid (*Characodon lateralis*) was, for years, one of the rarest livebearers in the hobby. This is a medium sized goodeid which lives in the bottom regions of the tank. It is a timid fish which needs to be kept in a group to feel secure. Only mature males show the deep scarlet; young males and females are a drab green with black blotches along the sides. Broods are born every eight weeks and are small, with ten being the average.

The Blue-tailed Goodeid (*Ataeniobius toweri*) is one of the larger goodeids, having 3in (7.6cm) males and 3½in (8.9cm) females. This is a peaceful mid-water species with black longitudinal stripes down the sides. Males are suffused with a blue sheen which is most prominent towards and in the tail. Broods are produced every six weeks, with twenty being the average.

The *Priapella intermedia*'s blue eye and white flashes may not make this a show stopper, but it still has a quiet charm all of its own. It is a medium sized fish of some 2-3in (5-7.6cm) and is exclusively a mid to upper water species. It is very nervous when confined in a small trap or

tank and often damages its lower jaw. The resultant infection often leads to death. Broods are born every four weeks and number an average of twenty.

The Cardinal Brachy (*Brachyrhaphis* sp.) is a new species to the hobby and is, as yet, undescribed by science. It is a medium sized fish of some 2½in to 3in (6.4-7.6cm) when mature. It is aggressive with smaller, more delicate, species. This is a robust, active fish which lives in the mid to upper water regions where it feeds on insects and other live foods in the wild. In the aquarium, a large proportion of meat or livefood should be fed to keep them in the best of health. The orange dorsal and distinctive black flash above the anal fin make this a striking fish which has already taken the specialist livebearer hobby by storm. Broods of about 30 are born on a monthly basis.

The Red Harlequin Halfbeak (*Normohamphus liemi liemi*) often comes in through the trade under the name of Celebes Halfbeak. It is a large species reaching 3½in to 4in (8.9-10cm). Being predatory by nature, care should be taken to place them only in a community of larger fish. This is without doubt one of the most attractive of the Halfbeaks, with the males having fine red and black fins. Mature males also develop a strange black fleshy growth on the lower jaw. Older females sometimes exhibit this, although never to such a marked degree. This is a surface dweller which likes plenty of plant cover at the top of the tank to hide in. The fry are born at monthly intervals and are extremely large (¾in to 1in — 2-2.5cm).

### Points to watch

This completes my line-up of my favourite eight species. Due to their disparate sizes, they cannot all be kept in the same tank together. However, with care, they all can be incorporated in community tanks, be they either predominantly livebearer tanks, or just as an unusual addition to your community tank. Most species will breed in such a set-up. However, the fry will usually fall prey either to the parents or to other fish.

The biggest problem with any community tank is what to keep with what. For example, closely related species can hybridise in a community situation. To prevent this from happening do not keep species together which have the same first name. While this is only a very general rule of thumb it still gives you an idea of what can be kept together. If in doubt you should contact the Livebearer Information Service which runs a free advisory service. This organisation also published a quarterly magazine for its members which contains two information sheets with colour photographs. Further information can be obtained from: Nigel Hunter, 60 Barry Way, Brighton Hill, Basingstoke, Hants.



# Spotlight on

# Livebearers

## AMARILLOS — LIVEBEARERS

Mexican research biologist, Constantino Macias García, is currently involved in a detailed study of the sexual behaviour of Amarillos, fish from his homeland that have become much sought after by specialist livebearer hobbyists.

**G**oodeid fish are small livebearers native to the highlands of Mexico. The family Goodeidae comprises several species including *Ameca splendens*, *Goodea atripinnis*, *Skiffia franciscae*, *Girardinichthys viviparus* and *G. multiradiatus*. Some of these are well known to the British aquarist, but most are almost unknown outside Mexico.

Despite the fact that Goodeids are regarded as tropical fish, many species inhabit temperate habitats. The genus *Girardinichthys*, in particular, is found in high altitude streams, ponds, lakes and rivers around Mexico City, where in winter, the water temperature frequently drops to freezing point. Of the two species in this genus, the Amarillo, *G. viviparus*, is the better known, perhaps because of the belief in Britain that it is an endangered species, which encourages the aquarist to breed it. However, the Amarillo is not now regarded as endangered, largely because of the rehabilitation of the Texcoco Lake, in the north of Mexico City, where this fish is nowadays particularly abundant.

The English names of these species seem inappropriate. "Amarillo" in Spanish means "yellow," and this name is given to the less yellow fish of the genus, *G. viviparus*. In fact, in the wild, *G. viviparus* looks almost black, whereas *G. multiradiatus* has brightly coloured yellow fins! Although it is difficult to change established common names, I will refer to *G. viviparus* as the Common Amarillo, and to *G. multiradiatus* as the Long-finned Amarillo, since the latter has larger fins.

I have only occasionally bred the Common Amarillo, but I have been breeding the Long-finned Amarillo with some success here in England for research purposes, so I will concentrate on this species, in the belief that the same methods will apply to both species.

In reviewing some of the British literature on breeding livebearers, I found that some Goodeid species, including the Amarillo, are regarded as sensitive and difficult to breed. Furthermore, the virtual absence of stocks of *G. multiradiatus* in England led me to believe that the Long-finned Amarillo also poses problems for breeding in captivity.



This scanning electron micrograph of a mid-term *Xenophorus captivus* embryo shows the trophotaeniae quite clearly. (John Dawes — reproduced with permission from the Centre for Electron Optics, University of Bath).

With this in mind I would like to describe the method I use to breed this genus, in the hope that it will help the British fishkeeper interested in livebearers.

### Sexual Behaviour

The Long-finned Amarillo exhibits, in common with the rest of the Goodeids, internal fertilisation. To fertilise the ova, the male and the female must synchronise their swimming, and approach each other laterally. Unlike Poeciliids (Guppy family), Goodeids do not have an intromittent gonopodium. Instead, the anterior end of the male's anal fin has a groove, or spermatopodium, that, during copulation, covers the vent of the female and forms a tube through which sperm, in the form of balls (spermatozoogmata), are delivered to the female's vent.

Another difference is that the Goodeid females, unlike the Poeciliids, are unable to store sperm for inseminating successive broods without the presence of males. As a result of these features, Goodeids have more elaborate displays, since the females must be more co-operative for mating. In addition, the males may defend females more aggressively than the Poeciliids do, since a female Goodeid, once inseminated by an intruder, is no longer worth courting, whereas Poeciliid males can still inseminate pregnant females.

Male *G. multiradiatus* are, in fact, particularly pugnacious, and, under aquarium conditions, may kill each other, in this respect resembling the Siamese Fighting Fish (*Betta splendens*). Furthermore, males may also chase females, especially the non-receptive ones.

As a general rule, it is advisable to keep either a single male, or a minimum of five

similar-sized males, in a tank in order to minimise victimisation of the smallest. This approach also ensures a gentle environment for the pregnant females that otherwise would be harassed by the aggressive males. The same rule applies for the females; large individuals may also be aggressive to other fish. A large (no less than 40 litres — 9 gals) "colony" tank, with 5-7 males and 8-10 females may be the optimal, especially if it is well planted. Alternatively, 1 male and 4-5 females will thrive in a smaller aquarium.

### Captive breeding

Breeding either species of Amarillo is not as straightforward as breeding Poeciliids. Large females chase males, and large males may stress the females, inducing abortions.

The first step in breeding this fish is to provide a gentle environment as described above. Both Amarillo species can easily tolerate hard water (up to 25°dH), and temperature may be maintained at 23°C (73.5°F), although it is not crucial (within a range of 17-30°C — 62.5-86°F).

After about six weeks some females will be noticeably swollen, indicating pregnancy. At this stage they must be separated to maternity tanks as described below. Some aquarists breed this species in the "colony" tank, but in my experience, this leads to many young being killed by the rest of the females (although some will survive). This is true even if the fish are very well fed, probably because, in nature, infanticide of other female's broods may be advantageous for survival of the killer's brood. In fact, the females that are near parturition are the most pugnacious, viciously attacking other females.

Premature parturitions (births) may be induced by either fights between females, or improper handling, with the result that the young are born with undeveloped fins and/or may have problems in filling their swim bladders. The first problem can be easily confused with Fin Rot and, in many cases, may actually develop into fin decay. The second problem nearly always leads to the death of the fry, any time from a few hours to six days after birth.

However, it is possible to minimise these losses by the use of an appropriate breeding trap. For this purpose I use an opaque plastic container, 30 x 6 x 6 cm (12 x 2.4 x 2.4 in) depth, with a 30 x 6 cm (12 x 2.4 in) acetate sheet forming a tank-long funnel through which the young can escape easily from the mother in the event of an attack. This device also has some other advantages: the mother is relatively undisturbed in an opaque container, and the young can reach the surface for filling their swim-bladder



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AQUARIAN

Top, a splendid male Long-finned Amarello, *Girardinichthys multiradiatus*.

Above, a pair of Common Amarellos, *G. viviparus* mating (the male is the smaller, lower fish).

Above, right, like all Goodeids, Amarello females give birth to very large young — the posterior third of a fry, along with the whitish tapeworm-like structures (trophotaeniae) which nourished it during gestation, can be seen protruding from the female's vent.

Right, *Skiffia francesae* is extinct in the wild but survives thanks to the efforts of dedicated aquarists.

without much effort.

Since this tank does not allow the use of filtering systems, I feed the females only on live food, especially *Daphnia*, which, as filter-feeders, have the additional advantage of helping to keep the water clean. Gentle aeration can be provided in the usual way.

Once the young can swim properly, they may be introduced to the "colony" tank, but it is safest to keep them separately for three weeks. After this time the young males will start to court their sisters, and must be separated in order to prevent inbreeding.

The introduction of the female into the breeding trap demands an initial trade-off on the part of the fishkeeper. If the female is introduced too late she may abort the young due to handling stress; too early, and

the water quality in the trap may deteriorate, damaging the health of mother and young. The optimal time, in my experience, is one week before the expected date of birth (about 7th week of pregnancy). If in doubt, remember that more young will survive late abortion than early miscarriage due to poisoned water.

Both adult and young *Girardinichthys* will accept commercial tropical fish food flakes, but in nature the Common Amarello feeds largely on algae; thus, vegetable flakes must be offered frequently. If live food, like *Daphnia*, Brine Shrimps or Amphipods are provided at least weekly, the fish will develop more vivid colour marking and iridescent skins, giving the desired reward to the keen breeder.

## Saving endangered species

Our interests in keeping aquarium fish and, indeed, animals in general, sometimes results in the depletion of natural populations which, especially in the Tropics, are very often already endangered by habitat destruction.

The fishkeeper keen on breeding endangered species may therefore effectively contribute to the effort to save species from extinction, thus reducing any serious threat to the native populations.

Aquarists, in my opinion, should work towards developing breeding techniques such that the aquarium market may eventually rely solely on production through captive breeding.



# Books

## The Manual of Fish Health

By: Dr Chris Andrews, Adrian Exell and Dr Neville Carrington  
Published by: Salamander Books Ltd  
ISBN: 0 86101 368 9  
Price: £12.95

Most previous works on fish diseases have concentrated merely on recognition and treatment and, up to now, this is apparently just what the hobbyist has needed. Recent thinking has transformed the reaction of hobbyists to disease into a more positive attitude rather than a quick remedy once things have gone too far. Additionally, and in a more subtle way, the whole of this aspect of the hobby has been turned around into a study of fish health rather than fish disease.

This latest release from Salamander Books has an impressive author line-up — Dr Chris Andrews (of the London Zoo Aquarium), Adrian Exell and Dr Carrington (Development Manager and Chairman, respectively, of Interpet Ltd). Although Salamander already have *Maintaining a Healthy Aquarium* by Dr Carrington in their *Fishkeeper's Guides To . . .* series, this work is much more comprehensive in its coverage of fish health. Recognising that previous works covered only two-thirds of the problem, the authors have combined to provide a very complete treatise which brings in the missing third: that of how the delicate balance between good and ill-health is upset and, more importantly, how it can be maintained in the fishes' favour. To illustrate the importance of this factor, fish diseases themselves hardly make an appearance in the book until Chapter 5 by which time subjects such as 'The Balance of Health', 'Living in Water', 'Understanding Water Chemistry' and 'Planning for Health' have been comprehensively examined.

From Chapter 5 onwards, disease hardly

THE INTERPET MANUAL OF

## FISH HEALTH



The comprehensive manual provides a deeper understanding of fish, their environment and the diseases that affect them.  
DR CHRIS ANDREWS, ADRIAN EXELL and DR NEVILLE CARRINGTON

stands a chance, such is the quality of accurate diagnosis and practical guidance as to reliable and successful treatment. Exceptionally clear photographs enable, if you'll pardon the pun, spot-on identification of the problem, be it parasitic or viral, whether it attacks the skin, eyes or even the internal organs, or whether the symptoms simply make the fish act abnormally.

Within the Chapter entitled 'The A-Z of Common Pests and Diseases', the coverage of each ailment is handled under the same headings — Caused by, Obvious symptoms/signs, Occurrence of the disease/problem and Treatment and control.

Furthermore, within the individual discussions, there is extra information as to how the disease originates and progresses through its own cyclic life. This will enable the hobbyist to take the necessary measures to break the cycle in the best place.

As usual, the excellence of production is exemplary, with the line drawings rivalling the photographs for quality. The manual represents a new departure in the Salamander range of aquatic publications: the size of the book is between the smaller *Fishkeeper's Guides* and the larger *Encyclopedia* format.

Summing up can be a reviewer's nightmare but, for once, the blurb on the jacket is exactly apt — 'This book is not simply an emergency manual of first-aid for fish, but

rather a complete guide to fish health in the widest sense.'

A final note: although, of necessity, there are unavoidable technical terms used, the book (despite its subject matter) is easy and enjoyable to read with much practical wisdom to impart to the reader. You owe it to your fishes to get a copy!

Dick Mills

## The Pond Book

By Valerie Porter  
Published by: Christopher Helm  
Price: £8.95

As with any hobby, one's involvement can become as deep or as shallow as interest (and time) permits. And it is part of the fascination of any hobby that, once bitten by a "bug" it is so easy to become sucked into whichever world that bug belongs.

While the majority of pondkeepers are very happy with a small water feature as part of an overall garden design, there are those of us who may never be content until the overall garden design is the pond!

*The Pond Book* is the perfect reference for just such people. No, this is not another tome on construction methods, filtration and stocking. *The Pond Book* goes much, much deeper.

Pick up this book and you are entering waters (sic) previously uncharted by the vast majority of hobbyists. Flow rates over V-notched weirs, spillways and artesian wells are not subjects normally encountered by the average enthusiast. However, any pondkeeper or general aquarist will derive information on pond management which (s)he didn't even suspect existed.

*The Pond Book* will serve both the aquarist and the naturalist well, as a practical analysis of the pond, from maintaining new ponds, rescuing derelict ponds, managing ponds for conservation or productivity, and pond-watching for pleasure; as well as looking at the nature, mechanics and history of ponds and the nature of water.

Valerie Porter is a full-time writer who specialises in country books, and lives in an area which contains numerous ponds, two of which she has managed single-handed.

Stephen J Smith

## Aquatic Weed Control

By: Chris Seagrave  
Published by: Fishing News Books  
Price: £12.00

*Aquatic Weed Control* is a book which delves into the mechanics of pondkeeping, specifically dealing with aquatic flora.

Few, if any, pondkeepers can safely say that they have never experienced problems with the invasion of plant life into their aquatic territory, painstakingly created mainly for aquatic fauna, usually fish. Multiply the size of your garden pond problem by several thousand, and you have

Derek



"You are dead right, Fred??? Piranhas — that's what they are!"

the kind of headache encountered day after day by agricultural and "aquacultural" managers.

**Aquatic Weed Control** provides an in-depth analysis of the problems caused by aquatic plants and the methods and consequences of control. This book will extend your insight far beyond the realms of your garden pond or Koi-pool, providing comprehensive and detailed advice on water-management on a grand scale.

Author Chris Seagrave is a senior lecturer in fish farming and fishery management at Sparsholt College, Hampshire, and a former research scientist at the Government fish diseases laboratory at Weymouth.

Stephen J Smith

## The Videoscene Tropical Freshwater Aquarium

Produced by: Videoscenes  
KPTV Dept VS,  
570 Southmead Road,  
Bristol BS10 5NH

Price: £14.95 + 96p p&p (includes background notes).

I've seen tropical freshwater videos which, quite frankly, have made me cringe. I was assured, though, that this one would be different. And it certainly is.

For a start, there's no commentary. Then the camera doesn't move at all in two hours' worth of viewing. The fish do, though, and it is they which make the film what it is, i.e. a "Videoscene Aquarium".

The idea is simplicity itself. To quote the makers of the film, their cassette "is designed to replace the 'live' community tropical aquarium". It is "for people who, for various reasons, might find it easier to cope with", and is aimed for use in places such as doctors'/dentists' surgeries, hair-dressers, airport lounges, etc. The idea is that the tape can be used to provide a "background of interest, instead of a dead TV screen."

In my opinion, the Videoscene Aquarium manages this very well indeed. I switched it on, looked at it for a while, enjoyed what I saw, left the tape running while I got on with some other editorial tasks, and kept wandering back to take a look... just like I do with my real tanks.

It struck me during one of these "trips"

that the tape could be used in much the same way as background music is when you are entertaining friends to dinner or drinks... as long as you keep the volume turned down quite low. If you don't, you may find (as I did) that the "bubble noise" begins to sound more and more like a running tap and can begin to get a little bit tiresome. However, if the sound is kept just loud enough to be heard, it becomes quite soothing — just like the real thing.

The selection of fish used is colourful, varied and interesting, exhibiting a range of body shapes, habits and swimming depths. The plants also look quite good, even though they have all been very obviously put in just prior to filming.

All in all, I think the producers of this film may well have found a new role for aquarium videos — not to say anything about a new use for a TV set. And, quite honestly, with the quality of some current programmes being as dodgy as it is, I would happily have a Videoscene Aquarium in my living room most evenings — not to stare blankly at it all night, but more as a soothing colourful, moving backdrop to my other activities.

Money well spent, in my opinion.

John Dawes

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# Your questions answered

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Every query receives a personal answer and, in addition, we will publish a selection of the most interesting questions and responses each month. Please indicate clearly on the top left hand corner of your envelope the name of the expert to whom your query should be directed. All letters must be accompanied by a S.A.E. and addressed to: Your Questions Answered, The Aquarist & Pondkeeper, c/o Dogworld Ltd, 9 Tufton Street, Ashford, Kent TN23 1QN.



**TROPICAL**  
Dr David Ford



**COLDWATER**  
Pauline Hodgkinson



**PLANTS**  
Barry James



**KOI**  
Roger Cleaver



**MARINE**  
Graham Cox



**DISCUS**  
Eberhard Schulze

## Plants

### Warm Chestnuts

*I have bought a plant which my dealer called a Water Chestnut. Can you give me any details on cultivation and how best to overwinter this species?*

The genus *Trapa*, often called the Water Chestnut, is widely distributed around the world and contains several species. The one which is offered for sale in the UK at the moment is *Trapa bicornis* which hails from South East Asia. The fruit is widely eaten in the Tropics.

It is a floating plant with a rosette of glossy dark green leaves. The base of the leaves are swollen with spongy tissue which gives the plant its buoyancy. The stalk is long-rooted in the bottom mud and has many nodes, each of which produces bunches of hair-like roots.

Flowers are white and the subsequent fruit resembles a pair of oxen horns. This bends over at formation and will be found by turning the plant upside down.

This plant requires warmth — a minimum temperature of 72°F (22°C) — to succeed. Fruits should be gathered in the late summer and stored in water at around 60°F (15.5°C) during the winter in a dark place. Raise the temperature to 72°F (22°C) in late April and they will then start into growth.



*Trapa natans* — one of the more commonly seen species of Water Chestnut.

## Marine

### Mysterious deaths

*I have recently moved down to Worthing, and, within a month, have lost two anemones for no apparent reason. Both seemed to take the move very well and were eating quite normally. Then one morning I discovered that both were literally disintegrating into a jelly-like substance. The only explanation I can think of is that the anemones did not like the very heavy lime in the water here.*

*I have yet to find an expert supplier in this area, and am therefore at a loss to discover any other cause. Could lime kill anemones, and, if so, can I counteract*

*it in some way?*

Although the tapwater in your part of Sussex is notoriously extremely hard, i.e. rich in calcium and/or magnesium ions, I don't think that this is the cause of death of your anemones. My reason for saying this is that the combined level of calcium and magnesium ions in both natural seawater and properly formulated artificial seawaters is in excess of 1600 parts per million. This indicates that seawater creatures have a very high tolerance of both calcium and magnesium in solution.

The fact that both your anemones died simultaneously and, literally, overnight one month after the move, would suggest some form of poisoning — either from bad, decomposing food, or from some toxic com-

ponent of your tapwater.

Periodically, but most commonly in spring and autumn, most Water Boards flush the mains through with special toxins designed to destroy all life-forms in the underground pipework systems feeding water from the reservoirs to the end users of the water. These chemicals are extremely damaging to fishes and invertebrates and are the frequent cause of "mystery-deaths" after partial water changes and topping up of evaporation losses.

### Mini aquarium pier

*I was wondering if you could tell me which woods are inert to chemical reaction in seawater. I am thinking of building the base structure of a pier or jetty in my tank as near to scale as possible using plastic pegs and simulated steel strapping bands also made of plastic. The tank will be for native marines as I find these more interesting than tropical marines.*

*Another reason I am asking is because I do not want to varnish the wood, so as to allow algae and invertebrates to take hold. I hope you can help me in this matter.*

The only wood I know of which doesn't contain significant quantities of natural, toxic preservative antibiotics, (i.e. resins, oils, etc.) is limewood. This temperate zone timber is

classified as a hardwood and has been used for many years in seawater aquaria, both for native marine and tropical marine creatures, to produce air micro-diffusion.

These small wooden blocks, drilled out and provided with a plastic connector for coupling to an airline, produce extremely minute air-bubbles which have a huge total surface area. This facilitates gas exchange on a large scale — much more efficiently than the gas exchange achieved using old-fashioned pumice-type diffusers, or even the modern plastic air diffusers.

As stated above, lime is the only timber which I would recommend as being safe in large quantities in a seawater aquarium, where the biochemical balance is delicately poised on a knife edge.

Obviously, your miniature model jetty would last much longer if made of oak, pitch-pine, mahogany or teak but I am reasonably confident that such a large timber structure in such a relatively small volume of seawater would leach out organic chemicals which would prove severely damaging to all forms of marine-life, not least to the vitally important nitrifying bacteria in your filtered bed.

Even some of our native timbers, such as elm, contain such large amounts of biocidal organic chemicals that, hollowed out longitudinally along the axis of the log, it was used in medieval Europe to make underground water pipes.

These primitive water pipes are still unearthed from time to time while foundations are being dug for modern buildings. So toxic is elm to bacteria, fungi, protozoa, etc., that even after all the intervening centuries buried in the ground, these pipes are usually found to be intact and still in good water-carrying condition.

## Coldwater Natural changes

*I have two black and gold Orandas which are beginning to lose all their black coloration. In addition, one of the fish has developed what looks like fungus on its hood. Despite treatment the problem persists. How can I cure this disease and how can I stop the fish changing colour?*

I am afraid that many people who purchase the very attractive

## NEXT MONTH

Following the pattern adopted so successfully in recent years, the February issue of A & P will feature the first of our much-sought-after, colourful Supplements.

Again, in keeping with the pattern set up when we launched our very first Supplement, our February edition will deal with the freshwater tropical hobby. This time, though, our chosen subject is with expert, colourful contributions from our team consisting of **Dick Mills, David Sands, Dr David Ford and Barry James.**

Past Supplements have been in very high demand, so make sure of getting your copy by ordering February's A & P early.

Other February highlights include:

- A thought-provoking Guest Editorial from **Dr Chris Andrews** of London Zoo Aquarium.
- "Doubling up" on Chris we'll also be featuring the first of three exceptionally good thorough articles from him on **Conservation** and what we can all do to safeguard the future of endangered fish species.
- For reptiles fans, **Dr Gareth Evans** introduces his favourite **Drawing Room Dragons.**
- Then there's **Star Spot** from **Peter Elphick**, written specially for marine aquarists.
- **Plants, Koi, cartoons, our regulars...** plus a select crop of very special one-offs are among the other offerings waiting just round the corner. See you there!

black and gold goldfish because they are attracted to their colours are disappointed when they realise that their fish are changing into self-gold, and are puzzled as to why this should have happened.

In actual fact, all metallic goldfish begin their lives as greenish brown, gradually turning darker until they are almost black. Then, from the underside, the golden colour begins to come through until the black fades away. This process can take weeks, months or even years and, in slow-changing strains, the black may remain on the finnage for months. So, you see, the condition is merely a natural process and not an indication of anything wrong.

Another natural condition with this type of goldfish with hoods is the white fungus-looking substance which, from time to time, the hood secretes. Please do not continue to treat this condition because it is all part and parcel of the hood's development and, by treating your fish, you are causing it unnecessary stress. Just be pleased that this is happening, as this is a good indication that the hood is developing properly.

### Bubble-bursting

*I have recently bought a Bubble Eye and am concerned that it*

*may damage itself with one of the plant lead weights I use as it probes around the bottom looking for food. I am also worried that it may be injured by my other fish. Will a bubble re-grow if it bursts?*

Bubble Eyes are one of my own favourite varieties of the goldfish, and I have, at the moment, quite a large number of these fish, including three which burst an eye sac at some time in the past.

I doubt that the damaged bubble will grow to match the remaining one, though the skin does heal and a new bubble develop. Of course, there is always a slight risk that accidental damage can be caused by objects such as lead plant weights, though I do believe that the risk is slight. Also, I do not think that there is any real danger from other goldfish. Even when a female Bubble Eye is hotly pursued by eager admirers during a spawning chase, I should think that few suffer any serious injuries.

Should a bubble burst, then, provided that the aquarium water is maintained in excellent condition by carrying out partial water changes daily, there is very little chance of infection and the skin will gradually, over a short period, disintegrate and a new bubble form.

## Tropical

### Chip Tank

*I have decided to build a tank using chip-board. Your comment would be most helpful.*

Chipboard is an ideal medium for large tanks, providing a heavy grade is used to allow screws to hold the sides together. Use good-quality steel screws and coat all the inside surface with a two-part resin.

Most DIY shops sell these resins, but if you are having difficulty in locating products, call at a car repair workshop or a car accessory shop. The two-part resin used for repairing car bodywork is ideal. To cut costs, you can even include the glass fibre.

Another resin that can be used is that included in the kits supplied for pond manufacture, again based on a two-part resin with glass fibre.

If the aquarium is well made with flush joints that would be water-tight without further treatment, you can then use a polyurethane varnish available from any decorating shop. Apply several coats, at least three, and allow each to dry thoroughly. A sanding with glass paper makes sure each coat adheres well.

Fill the tank and drain it a few times before use just to make sure no residual chemicals remain in the resin or varnish.

### Walking Cats

*I have bought a Walking Catfish and would like to know its scientific name. Can you help?*

The 'Walking Catfish' is not sufficient information to identify your fish because there are several such species. For example, *Clarias batrachus* is called the Albino Clarias and is an air breather that can 'walk' across land. *Clarias asotensis* is the Black Walking Catfish (there is a spotted variety and a brown one too). A common Clarias is *C. platycephalus* that is known to climb out of the tank if given the chance.

Because of their ability to take in air, these fish are not critical about water type and will eat any food that's offered, so they are an easy fish to keep. However, they grow to a large size (that depends on the species but can be over 12 inches; 30cm).



# Letters

## Loony Corys

I have three Bronze Corydoras — a male, a female, and one of their sons. Not very unusual, I agree, except that, since the son grew to around 2cm, the trio have been behaving in strange ways.

The first of their newly-acquired habits is to "hover" in midwater in the same way as Glass Catfish do. For no apparent reason, they do this about four inches away from the outlet of a powerhead which must tire them out considerably.

Their second habit is a pronounced interest in synchronised swimming — not just swimming around in a shoal, but actually shooting to the surface to grab air 'in formation'. The moment the female breaks the surface, the older of the males starts swimming up and, when he breaks the surface, the young male shoots up after him.

Is all this behaviour normal? If not, do you think I can enter my Corys for the British synchronised swimming squad for the next Olympics?

The third strange habit is only practised by the young male who regularly intercepts food before it touches the bottom of the tank. This involves him turning almost upside down! Does this fish need psychiatric help?

Matthew Bland  
Cambridge

### Editor's Note:

Many thanks for your letter regarding your loony Corys. Despite your worst fears (or hopes!), they are, in fact, doing what comes naturally... although there might just be a possibility that your young male is suffering some identity crisis and is beginning to think that he actually is an Upside-down Catfish (*Synodontis nigriventris*)!

John Dawes

## Ethics of naming fish

In my article on the Slim Bushfish in this issue of *A & P*, I suggested that *Ctenopoma abyssinicum* might be a synonym of a previously described fish, but that this required con-

firmed and then publication in a refereed journal.

Since then, I have heard a formal statement has been made indicating *C. abyssinicum* is a junior synonym of *C. pellegrini* and therefore the latter is the correct name to use. (Seegers, L., 1988; *Was ist Ctenopoma abyssinicum?* DATZ, 8, 291-295).

Although DATZ is not a scientific journal and it is doubtful the article was refereed by an appropriate specialist in fish taxonomy, it does appear to be substantially correct and well researched.

It does, however, raise the question of the ethics of attempting synonyms or descriptions of new species in the hobby press; an epidemic happily mainly confined to the continent. Many of these authors

appear unaware that there is an etiquette to be observed in science. A thorough knowledge of the genus, based on an examination of the type material, is necessary in order to be sure that the species has not already been described.

When describing a new species, or attempting a synonym, full details of morphological characteristics, together with illustrations, comparative notes, locality and habitat data, type designations and depositories are all required. (Types should be deposited in a national museum and made available to research workers on request.)

Providing these conditions are met, there is no real reason a hobby magazine cannot publish these items, but they would still be better in the appropriate scientific journal, where they

are less likely to be overlooked.

The study of a particular genus, especially if it is a large one, can be a long process taking several years. Publication in a scientific journal may take two years. Compare this with the six/eight weeks for a hobby journal and the attraction for the less rigorous researcher becomes clear.

Unfortunately, this allows the possibility of one worker usurping what is the intellectual property of another. This has, in fact, occurred, to my knowledge, several times recently. Whether this has occurred intentionally or not is irrelevant; had the research been thorough, the activity of another worker would have been apparent. Publication is not a race for fame, but a permanent record of presumed fact.

Taxonomy is beset with totally inadequate Victorian descriptions, but this is no reason to carry on this confusing tradition today.

David Armitage  
Bucks

## Another satisfied customer

I would like to thank *Aquarist & Pondkeeper* and T.F.H. Publications for the first prize that I won in your August issue competition.

I was presented with the books a short time ago by Janet Hardy of T.F.H. and am sure that they will give me hours of pleasure as I read them. They are of excellent quality and every bit as good as your book reviews said.

This letter also gives me the opportunity of congratulating you on an excellent magazine.

Phillip Laws  
South Woodham Ferrers  
Essex

### Editor's Note:

Pleased to see how well the books have been received (you did look quite satisfied in the photo we published last month!). Thanks for entering the competition, and thanks to T.F.H. for sponsoring it.

John Dawes

## COMPETITION WINNERS

### Tetra STAMP CALENDAR COMPETITION WINNERS

Fifty lucky *A & P* readers will be celebrating the New Year in style with a fabulous Stamp Calendar from Tetra. Space dictates that we cannot publish the address of the winners, but for the record, here are their names:

V. R. Meadow	Terry McCreery	G. Kerr
Martin Burns	Desmond Smyth	S. J. Hart
S. Luck	F. Croot	K. Plimmer
Mrs A. C. Middleton	Jacqueline Bell	B. Cheney
Roy Bryan	Chris Atkinson	L. T. Khoo
Alan George	Keith R. Smith	L. Dance
Josanne Hutchinson	K. Maer	Keith Hine
Miss J. Harris	J. R. Penley-Martin	W. D. Arthwaite
Jason Armstrong	M. Hughes	Ray Terry
Bryan Wyatt	B. C. Cleary	Keith S. Songhurst
Craig Foster	A. R. Hill	Brian Haycock
Nigel Hudson	P. Beason	Matthew Riley
Philip Davis	T. R. Maloney	Miss J. Tiley
Paul Bunyan	Miss T. Thompson	Peter Daniels
E. J. Pearce	James Clarke	Joseph Scott
Stephen Stone	James C. Kerr	Andrew Coventry
Simon Ruthven		Robert Potts

Congratulations to all our winners whose entries were the first 50 correct ones drawn from the 'notional' hat on 5 December.

Answer Check:	C. Goldfish Sticks
A. Doromin	D. Marin
B. Ruby	E. Tetramin

Sincere thanks to the hundreds of readers who entered and to Tetra for sponsoring such an original competition.



Even from this angle it is possible to see that this female has the characteristic chin pouch which confirms that she has a mouthful of eggs or fry.



As the mouth is gently prised open, the first fry can just be seen against the white tissues of the female's throat.



A writhing ball of very healthy 1½-month-old baby Dragon Fish.



The striking body markings and vividly coloured yolk sacs of the fry are well displayed against the blue background of the "transfer" bucket.



From the side, the ample supply of food that will take these fry through the next two weeks can be clearly appreciated.

## THE DRAGON FISH EXE

Magnificent, imperious, spectacularly beautiful . . . and protected by law — that's the Dragon Fish (*Scleropages formosus*). It is being bred in captivity quite legally, though, and *A & P* editor **John Dawes** is among the small handful of Westerners to have witnessed the results of one such scheme at close quarters. (Photographs by the author).

**"Y**ou mustn't call it an Arowana!" He was quite adamant. "It's either an Asian Boney Tongue or a Dragon

Fish, but certainly not an Arowana. Arowanas live in South America and Australia. In the Far East, we have Dragon Fish."

If anyone knows the name of these magnificent creatures, it has to be George

Tay, enthusiastic and respected one-time head of the Freshwater Division of the Singapore Government's Field Research Station, and now in command of Singapore's largest fish farm. After all, George was about the first person to breed *Scleropages formosus* in captivity using completely natural methods back in 1980-81.

In fact, his efforts were so successful that his department ended up with a surplus which was eventually released into the large lakes of the city's spectacular botanic gardens.

So, Dragon Fish it is! Anyway, whatever the name, *Scleropages formosus* is one of those fish which, once seen, is never forgotten. To say that it is beautiful is a gross





A stunning display of Dragon Fish at the Van Kleeef Aquarium in Singapore.

## EXPERIENCE

understatement in every sense.

Further, it exists in three distinct forms — all spectacular: silver, gold and (more rarely) red. Irrespective of its colour, this fish is much sought after in the Far East as a bearer of good luck, health and wealth. So much so, that it isn't regarded purely as a fish, but more as an integral part of Far Eastern culture.

### Prohibition

There is a snag, though: *Scleropages formosus* is listed in CITES Appendix I. CITES stands for Convention on International Trade in Endangered Species of Wild Fauna and Flora, and its Appendix I lists endangered species whose "commercial im-

port, export and sale is normally prohibited."

The "normally" bit refers to some possible exceptions where "the specimens . . . (are) of a species bred in captivity", or where "the specimens are intended for research, teaching, breeding or propagation purposes."

As a result of this prohibition, *Scleropages* has long been something of a challenge to some hobbyists and dealers — several of whom have landed in hot water as a consequence of their activities.

### Verification problems

Be that as it may, there is nothing preventing the captive breeding of the species nor, in theory, should there be any problems in

selling off fish bred in captivity. In reality, though, how do you prove to the satisfaction of the relevant authorities that you have met their requirements and have actually bred Dragon Fish in captivity for two consecutive generations (the minimum requirement)?

When you take into consideration the unequivocal fact that the time gap between generations is about five years for this species, then the problem is compounded even further.

In fact, it's so difficult to prove the two-generation factor that not even an official Government body such as George Tay's Field Research Station was able to convince the powers that be that the feat had actually been achieved. Verification is, clearly, a problem that is not peculiar just to the Superpowers!

So, what chance has a private operator got? I am absolutely convinced that the breeder I met had done what he claimed he had, but I can just as clearly see how easy it would be for an unscrupulous operator to make a false declaration. Therefore, for the moment at least, the problem seems insurmountable. However, as an optimist, I must believe that a workable formula can be found and that we can eventually enjoy the challenge and delights of buying and keeping captive-bred Dragon Fish, LEGALLY.

### Best laid plans

Now back to the story . . . as they say.

The breeding season for *Scleropages formosus* extends roughly between November and February. Despite my original plans to visit Singapore during that time of the year, circumstances made a date change unavoidable and I found myself there in August — more than two months before the "official" breeding season.

I therefore didn't hold out much hope that the to-ing and fro-ing of the previous year, plus the slow build-up of contacts even prior to that, were going to yield any results.

How wrong I was! My good friend Lim Kim Kiat of South Island Aquarium had worked hard at setting things up and had managed to arrange for me to visit Lee Ah See, who had been breeding Dragon Fish since the early 80's, in the company of Lau King Seh (David).

The process of arranging the meeting had taken several months because of the "delicate" nature of the subject and (as I subsequently discovered) because of an earlier and somewhat unfortunate experience that Lee Ah See had had with a visiting writer/researcher from Taiwan.

Further, the only reason that the meeting had been agreed was that Lee Ah See had known David since he (David) had been a little boy. Therefore, he trusted David implicitly and knew that he wasn't going to do anything irresponsible.

In the end, Lee Ah See agreed to allow David and me, along with Yong (Lim Yong Kwee), Hua (Lim Yong Hua) and Ang to visit him.

Diplomatically, Lim Kim Kiat stayed away. As a trader (and therefore a potential competitor of Lee Ah See), he felt it would be prudent to keep out of the picture.



David (in the foreground) helps Lee Ah See to check the fry over for signs of damage.

### Incomparable experience

What he missed was an incomparable experience that will remain imprinted in my mind for the rest of my life.

Lee Ah See took us to a natural-looking, odd, established pool at his farm in the Ulu Sembawang part of Singapore. The pool measured some 30 metres by 20 metres and was waist-deep. Swimming in the murky waters were, I was assured, four large Silver Dragons — two males and two females, which had already spawned the previous year.

To my delight and relief, I was told that one of the females was brooding a mouthful of fry. She had, in fact, been brooding them for about one and a half months, so we were getting pretty close to the time when she would release them — two more weeks at most.

As we talked, I took the pH (6.8) and temperature of the water (84°F — 29°C). Not that I'm ever likely to replicate conditions in my pond, of course — but purely through force of habit.

My mind wasn't really on the readings, but on the offer that Lee Ah See was in the process of making through David and Yong, my interpreters. He said that he would gladly net the female, open her mouth, remove the fry and raise them in a tank up in his fish house.

### Damage worry

Excited though I was at this unique offer, I expressed my concern about the fry. Wouldn't they get damaged? If not, would they survive? What about the female? Would she resume her normal way of life?

The answers were all reassuring. The fry should not suffer any damage because the females tend to protect them very adequately inside their mouths. At 1½ months, they were now at the stage where they could be reared quite satisfactorily in tanks. As far as

the female was concerned, Lee Ah See's vast experience had taught him that she would resume normal feeding without any trouble.

I asked why he was willing to show me the fry. His flattering response showed that, despite our very different cultures and levels of involvement with fish, we had a great deal in common.

Basically, he said that, in true fishkeeping tradition (which states that we are all a bit crazy!), I had travelled half a world in the hope of seeing Dragon Fish fry being brooded, and, on top of that, I believed him! I couldn't for the life of me see why I shouldn't — until he said that the Taiwanese gentleman I referred to earlier, had adopted a very different approach which virtually challenged Lee Ah See to prove that he was actually breeding the fish. His reaction was that he knew he was breeding the fish and therefore didn't need to prove anything to anybody. If he (the Taiwanese visitor) didn't believe him, that was his problem, not Lee's. The outcome of the exchange was that the Taiwanese writer returned home without catching even a glimpse of a single Dragon Fish fry.

I must admit that I felt honoured... I could also feel the adrenalin building up inside in expectation of what was to come.

Gently, Lee Ah See and David stepped into the pool with a long drag net and started their slow, patient back and forth trawls up and down, and then across. Six or seven unsuccessful attempts later, there was a shriek of triumph as they finally netted the desired female.

She was huge, and was very definitely "chinny" — showing a brood pouch not dissimilar to that seen in African Mouth-brooding Cichlids... only much, much larger.

As the female gradually settled down, Lee Ah See reached down and in a series of almost hypnotic, quasi-slow-motion moves,

effortlessly prised her mouth open.

Out poured a mass of writhing, perfectly formed, two-/three-inch, glistening bodies, each with its part-consumed, orange-pink, pointed yolk sac. What a sight that was! I kept having to control my breath as I focussed and re-focussed, first my eyes, then my camera lens, on this rarely-seen spectacle.

Then, in a flash, it was over. The female was duly returned to the pond and the fry gently tipped into a bucket and taken up to the fish house. There we counted them as we picked them out individually and checked them over for any signs of damage prior to releasing them into a tank containing acriflavine-treated water. Lee Ah See had been right; none of the fry were damaged in anyway. They were also very active and perfectly capable of swimming... just as if they had been practising for 1½ months inside the safety of their mother's cavernous mouth.

One thing that Lee Ah See got wrong was his prediction that there would be between 30 and 50 fry. We counted 93! This was a mammoth brood — even by Dragon Fish standards.

Relaxing over an ice-cool drink of chrysanthemum tea once we felt satisfied that things were OK with the fry, I gradually began to discover just how special a breeder of fish and other exotic animals Lee Ah See really is.

He was, apparently, the first man to breed Plecos in Singapore. He also raises millions of Fancy Goldfish. He even has a 10ft crocodile that he rescued as a 1ft youngster way back in 1969. And, of course, he has hundreds and hundreds of Dragon Fish — the fruits of his dedicated labours with these challenging fish since he started breeding them some six years ago.

### Uncertain future

The future, however, is uncertain. Like so many other breeders in Singapore, Lee Ah See is having to give up his present farm because it is situated on land that is being re-claimed by the Government. He already has a new farm elsewhere on the island where he is building several large ponds for his beloved Dragons. While he, his staff, family, pets and countless other fish will no doubt negotiate the move without difficulty, there is no knowing how the Dragon Fish are going to take to the new ponds. Even if they settle down quickly, no-one can foretell just how soon, if ever, they will return to their now-established pattern of annual spawnings. It would be a terrible shame if all the success which has been so patiently achieved over the past six seasons were to disappear in the name of progress.

We can only hope that the vast body of knowledge that Lee Ah See has acquired over the years will allow him to re-establish his breeding programme without any major setbacks. Time will tell...

My most sincere thanks go to this remarkable pioneer who shuns publicity like the plague, but who was nevertheless generous enough to share some of his secrets with me and, in so doing, provided me with an experience that I will never, ever forget.





DAVID ARMITAGE



DAVID ARMITAGE



DAVID ARMITAGE



DAVID ARMITAGE

Above, An adult pair of *Ctenopoma pellegrini* displaying to each other . . . or is it a pair of *C. nigropannosum* (see Postscript for explanation). Below, *Ctenopoma ashbysmithii* may well turn out to be made up of juvenile specimens of *C. pellegrini* following the latest information I have received. My thanks go to the British Museum (Natural History) for allowing me to photograph this specimen.

Top, This three-week-old *C. pellegrini* shows the markings found on *ashbysmithii*. Above centre, A fully grown specimen of *C. nigropannosum* in a display tank at last year's AAGB Members' Weekend. If the details in the postscript turn out to be correct, then the species is *C. pellegrini*. Above, At eight weeks this *C. pellegrini* has very attractive body markings.



DAVID ARMITAGE

# THE SLIM BUSHFISH

(First import and spawning of a little-known *Ctenopoma*)

**W**hen I wrote my first article on the *Ctenopomas*, in the August 1984 issue of *Aquarist & Pondkeeper*, I could only refer vaguely to the streamlined Bushfish, as I had no first hand experience. However, since then I have kept two of the species, so a few further notes are appropriate.

## The free-spawning bushfish

To recap, there are brood-caring and free-spawning *Ctenopoma* species. If we leave aside the former, we discover several distinct groups of the latter. There are the leaf-like predators; deep-bodied with a pointed snout and large eyes; the nocturnal *C. acutirostris*, and *C. ocellatum*, and the more out-going *C. oxyrinchum*. There is the *C. kingsleyae* group, including *C. petherici* and *C. argenteus*. Finally, there are slender-

bodied fish, similar in appearance to the Asian Climbing Perch, *Anabas*. These are *C. pellegrini*, *C. nigropannosum* and *C. multispinosa*, which, for convenience, I shall call the Slim Bushfish.

## Description of the species

My introduction to these fish came when I encountered two, 7cm (2.75in) light tan, elongate fish at Thames View Aquarium, Eton Wick. Their fins were clear and there

were two smudges on the body; one just behind the gill cover, and another, clearer, one just in front of the tail.

They were sold by the wholesaler as *Anabas*, although they clearly weren't. (Not least because they came from an African shipment). The apparent solution came when consulting H. J. Richter's '*Buch der Labyrinthfische*' (Neumann, Leipzig). There was a specimen clearly labelled as *C. nigropannosum* (but see **Postscript**), the



Twin-spot Bushfish, and this was confirmed by consulting Sterba's *Freshwater Fishes of the World* (Vista, London). They apparently grew to 17cm (6.7in). My first fish were all females and perfectly compatible, sharing a 20 gallon tank with *C. acrostictus*. Subsequent experience with males showed they were very aggressive towards each other.

The second species was obtained for me by Chris and Denise Brook, from the Pet Shop of Petts Wood. The fish were of similar shape to the above, but the body was dark, with faint bands, and the fins were also dark. There was no clue in the hobby literature; they had never been imported before, and it was a full year before I formed a firm idea as to their identity. The candidate name was *C. pellegrini* (see **Postscript**), usually dismissed as a synonym for *C. nigropannosum*. I arrived at this conclusion, partly because of a process of elimination (the only other large Slim Bushfish is *C. multispinnis*, which is marked with body spots), and partly because of the description by Boulenger. These 10 cm (3.9 in) fish were quite incompatible and would spend all their time mouth-wrestling, with consequent damage, so their 60 cm (24 in) tank had to be divided. Their size in the literature was given as 11 cm (4.3 in).

There is apparently a fourth species of Slim Bushfish, *C. ashbysmithii*, described as a dwarf by Banister and Bailey. They admit to its meristic similarity to *C. nigropannosum* and *C. pellegrini*, but point out its small size and colour pattern are unique. In life, their fish had a bronze sheen; 13-15 chain-like vertical bands and an elongate dark spot on the caudal peduncle which became lengthened in larger specimens.

### Distribution

*C. nigropannosum*, *C. pellegrini* and *C. ashbysmithii* all come from Zaire (Congo). Boulenger found *C. nigropannosum* in the region of Yangambi, near Kisangani, Gabon and the Congo, and *C. pellegrini* in the tributaries of the Ubanghi, in Zaire. Mathes found both species in swamps and flooded areas around Lake Tumba in the region of Itala. *C. ashbysmithii* was found south west of Kindu. *C. multispinnis* comes from further south; Zimbabwe (Rhodesia), Mozambique and S. Africa, often associated with the Zambezi River, although it does occur in headwaters of the Zaire River.

### Feeding

In the wild, these fish eat midge and other insect larvae, adult insects such as beetles, and aquatic organisms such as worms. Filamentous algae have also been found in their stomachs. In the aquarium they will eat anything; pellets, flakes, worms, etc., but are not particularly hard on plants. It is not advisable to give any of these Slim Bushfish too early a view of their food if the cover glass is off, because they are likely to leap up to meet it and it is highly inconvenient to chase them around the floor!

### Behaviour

Fish of these species not only look, but also behave, like *Anabas*. Mathes gave a

vivid account of the terrestrial perambulations of *C. pellegrini*. "They progress along the ground with a remarkable rapidity, using the irregularities of the soil, twigs and plants which furnish a very effective support for the pectorals and opercula. The fish's progression occurs by alternate contractions of the muscles of the left and right sides of the body; the pectoral advances and the operculum pivots like a veritable hinge on the pre-operculum which opens on one side when the body is curved toward the other. Afterward, the opposite side of the body contracts, the pectoral is brought back and the operculum re-closes. The same process is repeated for the pectorals and the operculum on the side". Later, he adds that it can really climb banks and cross considerable distances in this way.

The same has been noted of the other species. For instance, Glenn Merron says that *C. multispinnis* is known as the fish that falls from the sky, due to its appearance as much as 9 Km (5.6 miles) from the nearest water, usually after rain. His alternative explanation, that the fish walked there, was quite understandably treated with derision by the natives.

Of course, it is the highly developed labyrinth organ, possessed by most anabantoids, that makes them particularly adept at surviving with little or no water. I recall a *C. nigropannosum* of mine that leapt out of its tank and spent the night on the concrete floor. Discovered in the morning, totally dry and apparently dead, it nevertheless started to breathe within a few minutes of immersion in water.

### Breeding

With free-spawning Bushfish like these, the only way to determine the sex of the fish is by special spines behind the eye and in front of the tail of the male which help him hold the female during the embrace. These are quite easy to see, once you get your eye in. These Slim Bushfish only have the spines behind the eye (not the tail, as I said in Aug '84). Although I had determined my *C. pellegrini* were a pair on this basis, I had no hope of spawning them because of their hyper-aggressivity (the female dominated the male), and also because I assumed they and their accommodation were too small. However, I had occasion to remove the female to exhibit in February and when I returned her to the 60 cm (24 in) tank at 73°F (23°C), I removed the partition. Apart from a couple of Amazon Swords and two flower pots on their sides on the gravel base, there was no decoration.

I noticed no special courtship, other than the usual, excited rushing of the aggressive fish about the tank, usually apparently engaged in near mortal combat. However, four days later, I was surprised to see the tank swarming with thousands of tiny, newly-hatched larvae, which the adults ignored. In most free-spawners, including *Anabas*, several males pursue a female, trying to embrace her, but only succeed in doing so when she chooses to stop. Mathes found 3-4.2 thousand yellow eggs measuring 0.5-0.75 mm (0.02-0.03 in) in female *C.*

*pellegrini* found at the end of September.

Fed on Infusyl for two weeks, with Micro-worm added from the second, the fastest growing fish achieved 1.2 cm (0.5 in) in three weeks when they were already taking air.

### Possible synonymy

Watching the development of the fry allowed me to test my suspicions as to the identity of *C. ashbysmithii*. You will recall its authors claimed its colour pattern was unique. What made me suspicious was the tail blotch, shared by the much larger *C. nigropannosum*. Could *C. ashbysmithii* be a juvenile?

Like *C. ashbysmithii*, my young *C. pellegrini* had a copper/green sheen with chain-like vertical bands on the body, which have slowly faded with age. In fact, *C. multispinnis* young also have these bands, which degenerate with age to leave traces as spots on the flanks. Therefore, in view of the similarity to *C. nigropannosum* of *C. pellegrini*, the bands on the juveniles of the latter, which we can assume also occur on the former, as well as *C. ashbysmithii*, which shares the tail blotch of *C. nigropannosum*, I believe *C. ashbysmithii* to be juvenile *C. nigropannosum*. This will only be confirmed however, by publication in a refereed scientific publication after examination by a competent professional of specimens held throughout the world.

### Postscript

I have lately been informed, based on extensive examination of the literature and of type specimens worldwide, that the fish the hobby calls *C. nigropannosum* is *C. pellegrini* and, therefore, my newly-imported species is the real *C. nigropannosum*. *C. ashbysmithii*, which I refer to, above, as juvenile *C. nigropannosum*, is therefore in reality, juvenile *C. pellegrini*. As often in taxonomy, confusion rules! (See Letters Page in this issue for further details.)

### Acknowledgements

Thanks to Steve Norris, Arizona University, for advice and information.

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Note: For further details on *Ctenopoma* and other labyrinth fish, contact: Anabantoid Association of Great Britain, c/o Tim Groom (Secretary), 44 Springwell Gardens, Balby, Doncaster, South Yorkshire.





Slim and low in body shape, the Spade-headed Catfish is perfectly suited to survival in fast-flowing streams.

# Introducing THE SPADE-HEADED CATFISH\*

**Bill Tomey's** occasional introductions continue with a beautiful, highly specialised and rare catfish for the connoisseur.

\*The very appropriate common name, Spade-headed Catfish, was coined by David Sands in 1984 while researching Loricariid (Armoured Catfish) for one of his books.

**Scientific name:** *Pseudohemiodon laticeps* (Regan, 1904).

**Common names:** None.

**Origin:** As so many other armoured catfishes (Loricariidae) *Pseudohemiodon* originates from South American streams and rivers, being known more definitely from Paraguay where they have been recorded from the Río Paraná. However, it also seems that they have been caught in the tributaries of the upper Amazon system and



Ventral view of the mouth — a perfect example of superb precision biological engineering.

The spade-shaped head which is characteristic of the species can be fully appreciated in this shot.



in the border areas between Brazil and Bolivia within the Río Guaporé and Paraná systems.

**Year of import:** Although *Pseudohemiodon laticeps* has been known as from 1904 — the original description by Regan dates back to this year — it was only in 1986 that specimens of this species reached Europe in

good enough condition to be kept alive in aquaria successfully.

**Sex differences and size:** As long as *Pseudohemiodon* has not attained the adult size, differences between males and females are not easy to assess. Full-grown, however, the males show a much greater lengthening of the upper-tail filament, which is one of

the typical characteristics of these fishes. Besides, the males appear less broad and considerably slimmer than the females, and usually possess longer extremities around the lips. Adult fish could reach a size of 20cm (c 8in), the tail filament not included.

**Colour/Shape:** As pure bottom-dwellers, their colours agree completely with their surroundings in waters possessing a swift current. This, of course, depends on the dry and wet seasons. Specimens are very hard to detect, even in shallow waters. First, because, by day, they live more or less buried in the upper sand layer of the bottom. Secondly, their sandy colour, combined with dark stripes and specks, provides them with an excellent camouflage.

With their tapered shape and typical "sucking mouth" these fish are excellently equipped to maintain themselves in position in the swift currents of their natural waters. *Pseudohemiodon* live mainly on sandy bottoms, locally strewn with stones, pebbles, rocks, driftwood and roots in which shelter is found during the daytime. At twilight, they will wake up, after which they search actively for food.

**Biological/aquarium arrangements:** This short description of their natural habitat should be sufficient to show that *Pseudohemiodon laticeps* cannot be kept successfully in an aquarium purposely furnished with dense groups of decorative aquarium plants. In such circumstances, they can barely exist, let alone function properly or come into breeding condition.

This is only possible in an artificial environment which more or less imitates their natural habitat. Therefore *P. laticeps* is a fish for specialist hobbyists only. These fishes are nice study objects for those hobbyists who know a lot about a little, rather than for the hobbyists knowing a little about a lot!

**Water conditions and temperature:** Since *Pseudohemiodon laticeps* originates from swift-running waters it doesn't need a very high temperature, ranging from 21 up to 24°C (70-75°F). Regarding the water conditions, this species has proved strong and does not require specially prepared water; tapwater with a pH around 7 will do just fine; the total hardness should range between 12 and 16° dH.

**Nutrition and Diet:** The tell-tale sign of the fringed sucking mouth, and the rows of small teeth inside, indicate that *Pseudohemiodon laticeps* is what I call an "opportunity feeder". Wrongly, such fishes are often considered as eating only vegetable matter and, while this is an important part of their diet, nothing could be further from the truth. In the swift currents wherein these fish live, there is not much choice other than being an "opportunity feeder", which means that, in aquaria, they must receive a completely omnivorous diet. Another very important fact is that they are night dwellers, coming into activity at twilight, so they have to be fed in the evening.

There is evidence that in the aquarium *Pseudohemiodon* spp. "graze" and feed on

the layers of algae and overgrowths on stones. Of course, there is a "micro cosmos" of small organisms between the algae, where they search and hunt actively for slow-moving water slaters and other slow-moving water organisms dwelling about the bottom. They also feed on carrion (dead fishes) as well as rotting plants. Maybe surprisingly, I feed them everything, even minced beef heart mix and well cooked white (plain) rice, green peas from a tin, and so on . . . and they are very healthy!

**Reproduction:** As far as known, captive breeding has not been reported in the continent of Europe, but there is every sign that some specialised hobbyists will reach much the same results as with *Sturionoma parvum*; first tank-bred by Dave Allison in the UK.

**Condition profile:** The skin should be free of parasitical organisms, yellowish brown or straw yellow, with clearly defined brown or blackish specks and stripes forming a current pattern. The fringe along the lips should be clear whitish and not appear slimy or glutinous and, most of all, a healthy fish should exhibit bulging eyes (which enable them to bury themselves in the bottom sand with the eyes clearly above "level" so as not to blur their vision). Sunken eyes point in the direction of an undesirable condition, indicating that the specimen in question has already suffered so much that only a "small miracle" can help.

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# CENTRAL HEATING FOR KOI

**O**f all the things I have learned about Koi-keeping there is, perhaps, one fact that is totally undeniable — Koi do not thrive, do well, or need temperatures of less than 50°F (10°C).

This is fine if you live in Mihara, Isawa, Bangkok or Singapore where it is quite an event for sub 50°F temperatures to be recorded for a continuous period of more than 10 minutes! However if, like me, you live in an area like Cheshire, whose winter temperatures range from freezing cold to very freezing cold, you've got a problem.

The biggest problem in the UK is not the intensity of the winter cold, but the LENGTH of our winters. Over the past five years, I have recorded temperatures of less than 50°F for almost 33 months out of 60! In addition, the highest pond temperature I have recorded was 73°F (23°C), and that, only for a very short period in one year. The realistic average "summer" temperatures are nearer 60°F (15.5°C).

Winter in the UK can expect to see an unheated pond drop below 50°F some time in early November and not rise above it again until late May the following year. This is just no good for Koi.

Some people will be reading this thinking ... my pond freezes up every February until March and I have no problems. But how many do have problems in late April, May, and June? "Spring Fever", as it is colloquially referred to, claims the lives of countless Koi each year and is really nothing to do with spring; it is the results of your Koi spending six months freezing!

Low winter temperatures are bad enough but the real "double jeopardy" courtesy of our UK climate is low summer pond temperatures. Koi are genetically incapable of efficiently converting consumed nutrients, fats and proteins, into body bulk at temperatures lower than 65°F (18°C). This means that, for most of the summer, when temperatures only rarely rise much above 65°F in most people's ponds, Koi are unable to use this time of plenty to gain significantly in weight and growth.

It is this combination of extended periods of cold pond temperatures during the very long winter months, and the lack of sufficient summer warmth to allow our Koi to grow and build up body weight, that is at the heart of many of our problems.

## Importance of summer heat

It is for this reason that I advocate that, not only do you consider heating your ponds during the winter to maintain a reasonable minimum (50°F), but, just as

Nigel Caddock continues his series of thought-provoking articles with his characteristically personal thoughts on keeping Koi happy and healthy during the winter months.

(Photographs by the author).



In my opinion, you can't expect to produce and maintain top-quality Koi like this Gin Rin Kohaku owned by Ed Clarke without the extra help provided by a good heating system, at the very least, during the winter months.

important, and maybe even more critical, ALSO HEAT YOUR PONDS IN THE SUMMER(!) to provide the supplementary heat necessary to give your Koi at least four months of consistent temperatures of 65-75°F (18-24°C) and an opportunity to develop to their true potential.

In addition to the health problems associated with prolonged low pond temperatures, I, for one, would like a hobby for twelve months of the year, not six. There really is nothing more depressing than gazing out on a freezing January day at Koi lined up on the bottom of one's pond like tin soldiers. Not only is this bad for Koi, but it's not much fun for hobbyists either.

Jumbo Koi in Japan are not uncommon, but how many true Jumbo Koi can you think of in the UK? Very few. A contributory factor is the inherent UK problem of low water temperatures. I can't afford Jumbo Koi, but I would like my Koi to have the opportunity to grow and flourish and reach their real potential, rather than struggle from brief summer to brief summer and playing Russian Roulette with their lives each winter.

## Heating Options

With this objective in mind what are the options? Like every other aspect of the hobby, you pay your money and take your choice. The state of the art at present offers the following options:

### Electrical Pond Heater Sticks

A range of inexpensive aquarium and pond heaters are available ranging up to 300W. These are designed to maintain a small hole open in frozen ponds, but, to maintain a mean temperature of 50°F through an average uncovered or part-covered 2000gal (9000 litres) pond would need about 10 x 300 units providing 3KW.

### Electrical Immersion Elements

These come in a range of sizes up to 5KW. Again, they are relatively cheap, but require expert installation and are expensive to run. One 3KW unit would maintain a level of 50°F in our 2000gal example pond.

### Electrical Heat Exchangers

These elements are fabricated in stainless steel tubes and come in a range of sizes. 10KW is the largest I have seen, but no doubt, they come larger. They are expensive to buy, expensive to run and install, but are the most efficient of the electrical options.

## WARNING

If you decide on an electrical appliance of ANY TYPE, I would strongly advise you seek professional help, as the potential for





Small unfrozen holes like this are fine for dispersing toxic gases and aiding winter survival but they won't ensure continued growth of fish at freezing temperatures.

disaster where electricity and water are in close proximity, is obvious. In addition, it is paramount that you fit a proprietary earth leakage device to cut off the supply of electricity in the event of a fault.

I would advise all hobbyists with ANY electrical appliances in their ponds to fit such a device. **IT MAY JUST SAVE YOUR LIFE.**

#### Central Heating Extension

Several of my fellow hobbyists have engineered an ingenious extension to their domestic central heating system, running a loop of stainless steel from their house central heating system into the pond filter. This is relatively inexpensive and, although, clearly, it puts pressure on the house heating system, it does seem to work very well.

The disadvantage is that these systems are not very controllable and, of course,

only work when the house heating system is on. This option is a very cost-effective one which is being successfully used by numerous hobbyists... and it works.

#### Pond Boilers

These are widely used in Japan and are run by a variety of fuels from coal to Liquid Petroleum Gas (LPG) or Calor Gas. In the UK proprietary pond boilers are offered by a range of suppliers and they are spectacularly successful. They are easily fitted into existing systems and provide total temperature controllability.

The bad news is they are expensive to buy and expensive to run. However, if you want control, this is the option for you.

120,000 BTU systems specially designed to stand outside in the elements have been available for some time. Smaller 60,000 BTU models that will provide total control for up to 7500 gal (33,750 litres) ponds and



Sheeting stretched over the top of a pond will help keep things under control, but will do little or nothing to help fish grow over winter — unless ample supplementary heat is provided.

are significantly cheaper than the 120k BTU models to buy and run are now available from selected suppliers. For those who do not have gas, LPG models are available, although these would involve additional costs of storage tanks.

#### Perspective is important

Whatever system you choose, it is important to keep the price in perspective. The one-off installation cost of a gas boiler is really only the price of a good-grade 22in Koi, and the compensations such heating systems offer are immense.

It is also clear that the efficiency of any heating system can be enhanced by devising some form of cover for your pond, but that's another story. Enjoy your winter Koi-keeping and DO heat your water one way or another. It will help your Koi and allow you to enjoy this amazing hobby all year.

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# DEEP-FROZEN KOI

Jerzy Gawor re-tells the incredible story of his back-from-the-dead beloved Shusui.

It was interesting reading John Cuvelier's column (*A & P* October 1988) entitled 'Resuscitating Walkabout Koi'. It reminded me of an experience I had with one of my Koi two years ago. Read on . . .

I was working fairly late into the night on the usual backlog of *Aquarist's* paperwork and correspondence. Being early December it was quite cold and I distinctly remember savouring my mug of hot chocolate. By the time I had closed my books it was about 1 a.m. Although there was still work to be done I felt that enough was enough.

I still don't know why to this day, but for some reason, I pulled back the curtain on the window which overlooks our back garden, just to have a look outdoors. Frost was gathering on the lawn. I scanned the familiar shadows and shapes of the pond which resides some twenty feet from the window and is raised above the concrete patio floor. Not a bad pond I thought, a modest 1,500 gallons, boasting a dozen or so 'pretty' Koi. I thought of all the work that I and my wife had spent in building the pond the previous year; the digging, the mess, the cement mixing, but it was worth it.

## Mysterious shadow

As I peered into the blackness my eyes passed over a shadow unfamiliar in shape and position. Did it move or was it the poor lighting? As I strained my eyes to focus, I could just make out the shape of a fish! My fish?!!!!

Thinking nothing of the icy chill outside, I unlocked the back door and darted out to where the shadow lay. It appeared that my little blue and orange Shusui had taken a leap, for whatever reason, found its way over the top of the pond, and, no doubt, landed with a thump some three feet below on the concrete patio.

It was lifeless, almost rigid with cold, and covered in dirt and dust. I can't imagine how long it had been out of the water. An hour, two, three . . . or longer? I will never know.

Although I was convinced it was dead, previous experience including one with some *Corydoras* catfish brought to my laboratory (but that's another story!) prevented me from leaving the fish and going to bed.

## Freezing First Aid

Just as John describes in his column, I picked up the fish, held it loosely in my hands and immersed it into the water. The shock of the icy temperature numbed my hands with painful jolts shooting up my arm. It was bitterly cold; Jack Frost was about and he was definitely no Koi-keeper!

However, I held on to my Shusui and gently rocked it back and forth in the venturi stream of my pump. After about four or five minutes I took a close look . . . nothing. Not a movement, not a gasp,

nothing that told me 'I'm alive. Help me live!'

Undaunted I immersed it again into the black water and just held on while the air/water jet from the venturi bathed its body.

Although my hands had lost their feeling I distinctly felt the fish quiver. My imagination? No, it flapped its tail suddenly and actually slipped from my hold! I picked it out of the water and looked closely. One gill was now moving up and down, and shivers of life were just visible from the tail.

By now, commonsense was dictating I should cut my losses and go to bed. It must have been below freezing-point and here I was dressed in pyjamas with my arm immersed in my pond at well past 1 a.m.

Had a neighbour looked out of their window they may have called the police about some lunatic leaping around the fish pond in the middle of the night! After what seemed like half an hour, I decided that it was either my life or the fish's! I felt that there was little else I could do. The rest was up to Our Creator, who I'm sure has a soft spot for Koi (otherwise why create something so beautiful). I let the fish go and with a silent prayer crawled indoors and to bed. By now it was actually 2.40 a.m. (so much for my half hour — my brain was obviously frozen in time). I had stood by the pond nursing my little fish for over one and a half hours!

Next morning, however, I was first out of the house to see the fish. I was none the worse for the exploits of the previous night but I wondered about the Shusui. There was no immediate sign of death, no corpse floating on the pond surface. After a few anxious moments I could not contain my excitement when I saw my Shusui swimming on its own at the far end of the pond. It did not appear lethargic or, indeed, any the worse for the ordeal.

## Grateful Koi

Instinctively I put my hand in the water and flicked my fingers as if to beckon it over. What happened next just defies explanation, but makes one stop and think that there is more to this world than the scientific 'eye' can ever hope to see. My Shusui, who only a few hours earlier had been 'dead', swam over to where my hand

was and brushed against my fingers in such a manner as if to say 'Thanks mate! This is a manoeuvre that it had never performed before . . . or has, since.'

## Long convalescence

After about a week I noticed that both flanks of the fish had become heavily fungused. Microexamination of tissues taken from these areas indeed showed a typical fungal infection with a total absence of protozoans or fluke parasites. It was far too cold for these 'higher' organisms to thrive anyway. Bacterial involvement was not suspected. I had to do something even though treatment in cold weather is not recommended. I could see that the fungus would otherwise frustrate all my lifesaving attempts.

I decided to net the fish and dab a 5% solution of malachite green directly onto the fungused areas, which by now extended from pectoral fin to the tail on both sides. I continued daily application for six days, by which time the fungus was receding. I was jubilant when all traces of the fungus had gone, but dumbfounded when the underlying skin peeled off like a banana-skin revealing raw flesh underneath.

For this degree of tissue loss I felt that a warmer temperature was required if skin was to regenerate quickly. I transferred the fish into a 30-gallon quarantine tank (with filter) indoors, allowing two days for the change in conditions and temperature. Fortunately, the increased temperature allowed the fish to feed and together with an occasional dose of Eradick, it was back in the pond by the following May. Yes, five months in quarantine.

Today, almost two years on, this Shusui has attained a size of approximately 18 inches. It shoals with the other Koi and is as lively now as the day I acquired it.

There are no marks on the skin betraying the dreadful skin loss that had occurred. I can certainly say, with some experience, that the Koi is a very hardy animal and, in many instances, survives in spite of, not because of the aquarist!

I was lucky with my Koi. I fear a different ending would have occurred had I not found it in time by sheer chance, or indeed if it had been the middle of summer and not the cold (but literally life-preserving) middle of winter.

The 'victim' photographed in a quarantine tank about two months before the 'ordeal'. The Kohaku (pictured) is now approaching 14" in length.





# News

## 'Aquarian' boost their USA business

Throughout last October, Dr David Ford was sponsored by Thomas's, the manufacturers of 'Aquarian', on a State-wide American tour to help their USA distributors, Mardel Laboratories Inc., in a distribution drive for the product.

Many British aquarists have heard David's lecture on the development of 'Aquarian' and 'Aquaria International — fish-keeping in 16 different countries'. Both these lectures were given in 10 venues, necessitating 14 flights across 3 time zones during his trip!

Dr Ford met aquarists in Buffalo, New York State; Long Beach, California; Canton, Ohio; Indianapolis; Dallas, Houston and San Antonio in Texas, and in the Shedd Aquarium, Chicago. En route home, he also lectured at the famous Bermuda Aquarium.

David (who is head of the 'Aquarian' Advisory Service\*)

reported that fishkeepers' problems are much the same all over the world, so he was able to help many of the American hobbyists. "They also showed me many new ideas, especially with their love of technology."

He noted that there is a wide range of North American fishes that are numerous, hardy and colourful and would make ideal aquarium specimens. Any importer who wants an American contact address, or any reader wishing to obtain a copy of *Fishkeeping Made Easy* and/or further information on fish-keeping, should write to Dr David Ford at Thomas's, Oakwell Way, Birstall, Batley, W. Yorks WF17 9LU.

\* The 'Aquarian' Advisory Service has now produced the perfect solution for novice fishkeepers, *Fishkeeping Made Easy*, a step-by-step guide to the fascinating and beautiful hobby of fishkeeping. This is a full-



Dr David Ford

colour booklet with vivid pictures conveying the colour and beauty of fishkeeping. It shows the ease and pleasure of a hobby which is the perfect pastime for all the family, and demonstrates how one can get maximum fulfilment out of an aquarium.

## The Yorkshire Aquarist Festival returns to Doncaster!!

'Good news for all — The ever-popular Yorkshire Aquarist Festival is to return to the Exhibition Centre at Doncaster, otherwise known to us all as 'The Racecourse' on the 15 and 16 April, 1989.

Preliminary enquiries have shown that the Racecourse is the most popular venue, and the majority of Traders appear to favour a spring date.

The 1988 Festival at Bridlington sported a fabulous exhibition of Tableaux, and the Committee are hoping for a repetition, although last year's standard will be hard to beat."

Already the Show Secretary, Mick Tomkinson, has reported a large increase in the number of fish entered for the Fish of the Year stand and he is expecting keen competition among the exhibitors.

The YAF organisers have been promised that the Caravan Site will be open for the Festival and this should alleviate any problems among our supporters who bring their 'vans', tents, etc.

The Yorkshire Aquarist Festival Committee would like to take this opportunity of wishing everyone all the very best for 1989, and look forward to seeing new and familiar faces at the forthcoming 1989 Festival.'

## FBAS celebrates its Golden Jubilee Year

Over 100 guests gathered at Twickenham Rugby Football Ground's West Pavilion Suite for a dinner dance to celebrate the Golden Jubilee Anniversary of the forming of the Federation of British Aquatic Societies.

A large number of eminent aquarists (both past and present), together with representatives from the Trade, heard FBAS Chairman Joe Nethersell

thank all those who had worked hard over the years to consolidate and maintain the comprehensive services which well over 100 member and associated member societies now depend upon and enjoy.

In response to a toast to the Trade, Dr Neville Carrington (after pondering awhile on why he had been nominated to reply) gave a witty resumé of the hobby's progress over the past 50 years, coming to the happy conclusion that many aquatic costs had plummeted in real terms, notably fish prices.

Alastair Agutter, for Sharp Image Publications and Promotions Inc (Sponsors for Fishworld '89), paid tribute to the Federation's contribution to the fishkeeping hobby and was confident that the FBAS would equally rise to the challenges in

the future of new areas of international co-operation once the official link-up with Europe came into force in 1992.

Highlights of the evening included vibrant and toe-tapping music by the group, Casablanca, together with excellent comedy-magic from Keith Fields.

## Fishworld '89 Update

With immediate effect, the organisation of the Fishworld '89 Exhibition will be transferred to: Reflex Advertising & Publicity, Brockley House, Endwell Road, Bexhill-on-Sea, East Sussex TN40 1EA. Tel: (0424) 219565.

All enquiries regarding the ex-

hibition should be directed by Mr Alastair Agutter at the above address.



**FOR MORE NEWS FROM THE SOCIETIES SEE PAGE 16**



# THE TOADY — OR HOW TO SWALLOW POISON WITHOUT REALLY TRYING

The things some people do for a living! Dr Andrew Allen reports on the weird, unsavoury, and potentially hazardous life of 17-18th century toad eaters.

**N**o fair in 17th or 18th century England was complete without a toady, or toad-eater: a man who swallowed toads for his living.

Toadies or toad-eaters were ill-paid hirelings who travelled from fair to fair, market to market, and village to village, in the retinue of a mountebank or itinerant quack doctor 'swallowing live toads, popularly supposed to be poisonous, in order to make their employers effect seemingly miraculous cures' (Sir Thomas Browne, *Vulgar Errors*, 1646).

After the toady had swallowed a toad, slumped to the ground in a theatrical faint, had a dose of the quack's patent medicine forced through his dying lips, and come back from the threshold of death, the triumphant mountebank would make his way through the gaping gullible fairground crowd doing good business selling little vials of his marvellous cure-all elixir.

Mountebanks were popular figures in the Merry England of ballad singers, bear wards, buffoons, charlatans, clowns, comedians, geomancers, hocus pocus men, jugglers, merry andrews, minstrels, puppet masters, rope dancers, tooth drawers, and tumblers. But their servile dependents, the toadies, with their nauseating trade of swallowing live toads, were the lowest form of life conceivable:

'Be the most scorn'd Jack-Pudding in all the pack,

And turn Toad-Eater to some foreign quack'

sneers Browne in his *Satires on Quackery*. Before the 18th century was halfway through, the words toady and toad-eater had also taken on the metaphorical meaning (fawning flatterer, sycophant, creep) they



Hans Buling was a mountebank who, like all the others, was accompanied by a 'toady' on his travels through 17-18th century England. (Photograph of 1793 engraving from *A collection of four hundred portraits*, London, Reeves and Turner, Vol I, reproduced by kind courtesy of the Wellcome Institute Library, London).

have today:

"David begged an explanation of what she meant by a Toad-Eater", writes Fielding in *David Simple* (1744), "and Cynthia replied 'it is a metaphor taken from a Mountebank's Boy's eating Toads, in order

to show his Master's skill in expelling poison. It is built on a supposition that people who are in a state of dependence, are forced to do the most nauseous things that can be thought on, to please their Patrons".

In her *Life and Letters* (1766) Lady Lennox writes 'I have got Charles into such order that he toad-eats me beyond conception'; Stanhope's *Pitt* (vol. 3, 1799) tells of 'the delight of being toad-eated by all India from Cabul to Assam'.

Of course, toads really are very poisonous, and if you or I made the serious mistake of trying to swallow a toad the consequences would be unpleasant and possibly (depending on the size of the toad, state of health and heart of the swallower, etc) fatal.

But strange though it may seem, a skilled and practised toad-eater was in no great danger when he swallowed toads.

## Munition factory skin

The warty skin of the common European Toad *Bufo bufo* is a marvellous miniaturised munitions factory producing a battery of irritants, deliriants, hallucinogens (eg *bufotenin*, the active ingredient of the witch's ointment), and heart-stopping cardiac poisons (bufadienolides such as *bufogin*, *bufotalin*, etc). When the toad is attacked by say, a dog, muscles around the warts contract, squeezing out bead after bead of acrid milky venom until the toad is covered with a foul froth of poison. The dog takes a bite, retreats foaming at the mouth and bowling with anguish and, if it has any sense, learns its lesson: THIS ANIMAL IS TABOO!

But the toad with its equable temperament only secretes venom when it is very, very frightened. And its poisons, unpleasant and potentially lethal when absorbed through the mucus membranes of the mouth, are rendered all but harmless by the acid gastric juices of the stomach (the poisons are there to deter predators, not to exert a pyrrhic retro-active revenge). These two facts taken together explain why toad-eaters could swallow deadly poisonous toads without really dying.

The art of toad-eating consists in pampering the toad so that it stays calm and then swallowing it down nonchalantly and all of a sudden, before it has time to become alarmed and sweat poison.

We know something of the practice of toad-eating because there are still frog- and toad-eaters in South and Central America swallowing a variety of small bufonids and other frogs and toads, some of them decidedly dangerous. Friedrich Morton, for example, describes his conversations with the toad-eaters of Guatemala in his *Xelokuk: Abenteuer im Uruvald von Guatemala*.

In Sicily the *gratoli* or 'wanderers' were healers specialising in the cure of, and sale of cures for, snake-bite who used to swallow down freshly-milked viper venom to show their immunity to poison. They were in no great danger either. Viper venom, potentially lethal when injected into the bloodstream, is quite harmless when taken by mouth or swallowed, which is why — provided your lips are not cut or chapped — it is safe to suck venom from a wound.



## PRODUCT ROUND-UP

BY DICK MILLS

### NEW PRODUCTS



#### SOCIETY FOR COMPANION ANIMAL STUDIES

Nowadays 50 per cent of households own a pet of some description, and there are many reasons for doing so including companionship, security and protection reasons.

An added bonus, especially so with aquatic pets, is as a stress-reducing aid. To give a closer insight into the human-animal bond, SCAS has (in conjunction with the British Small Animal Veterinary Association) produced a slide presentation on this very subject. The show, which lasts approximately 20 minutes, has been designed for veterinary surgeons and animal experts to show in schools, clubs and community groups. You can learn something new by asking your local vet or SCAS member to come along and speak to your Club.

For further information contact: ANNE DOCHERTY, S.C.A.S. (Tel: 041-945 2088) or PIPPA TRETOWAN, S.C.A.S. (Tel: 01-255 2424).

#### AQUA-SOIL

Swiftly following up their specially formulated medium of five soils and slow-release fertilisers for the growing of pond and bog plants, AQUA-SOIL have just introduced TROPICAL AQUA-SOIL for aquarium use. The soil has a neutral pH, and is contained in specially-

designed and coloured growing trays.

The trays have a large rim to the base, similar to that found around the base of some designs of undergravel filter plates, and this anchors the tray beneath the gravel; a special lip around the top of the tray ensures that the gravel stays around the plant and is not dispersed by the action of the fishes. There is ample room for root development and it is recommended that each tray has a limited 'population' of five plants.

The 'Standard Pack' (suitable for a 2ft tank) contains two triangular 'corner' trays and two 'straight' trays for background use; the 'Extender Pack' contains four extra straight units so that, in conjunction with a Standard Pack, three and four foot tanks can be completely furnished. Full pictorial and written instructions are enclosed with each pack. RRP is £2.99 for each Pack.

Available from most aquarium shops and garden centres having aquatic departments. Details from: AQUA-SOIL PRODUCTS LTD, Mount Zion Mill, Diptford, Totnes, Devon TQ9 7NG (Tel: 054 882 592).

[NOTE: Please use this new address, and not as quoted in November's *A & P*].

#### UNDERWORLD PRODUCTS

A falling pH is something that freshwater fishkeepers don't worry about unduly (in fact, many would be only too delighted at the occurrence), but to the marine hobbyist it is almost equivalent to the appearance of the Four Horsemen of the Apocalypse.

To continue the frivolous metaphor, galloping to the rescue come SEATEST — Alkalinity and SEABUFFER — pH and Alkalinity Booster.

SeaTest Alkalinity is a simple test kit to determine the alkalinity or buffer capacity (resistance to pH changes) of the marine aquarium water. The kit has three components — a measuring vial, a titration vial and a dropper bottle of titration reagent. The Alkalinity test kit

## FRY FOODS

Feeding young fishes need not be the worrying experience it used to be and, with fish-breeding becoming more of a deliberate planned event on the part of the hobbyist rather than a surprise spontaneous action on the part of the fishes, this is just as well.

In preparation of the hoped-for 'happy event' you should anticipate the feeding requirements of the young fishes. Make sure that you not only have the correct type of food, but also that you can maintain a regular supply in the weeks to come. This will entail setting up consecutive cultures of live foods, for instance.

The difficult part (knowing what to feed and when) depends largely upon what species are

bred. Livebearer young are large enough to fend for themselves and are capable of taking relatively large particles of food right from the moment of birth. Egg-laying fry, on the other hand, take a longer period to hatch and develop to the same stage and, consequently, require far smaller foods. Additionally, different egg-laying species produce different-sized fry so that you cannot reliably settle on one 'egg-layer' particle size and expect it to suit all species.

An old adage was to gauge the size of food particle required by comparing it to the eye of the fry — this was all very well if you could see the fry in the first place! You cannot always depend on fishes providing fry proportionately-sized to that of



retails at £14.37 and there is a reagent refill available at £5.74.

Once you have confirmed the level of alkalinity, should corrective measures be needed then you just reach for SeaBuffer: a single dose of this special blend of bicarbonate, carbonate and borate buffers will increase and maintain alkalinity and pH in marine aquariums in steps of around 0.1-0.2 units without the risk of shock or stress to the fish. In short, it is a safe and easy way of controlling dangerous low pH levels. SeaBuffer retails at £5.99.

Details of these and other Aquarium Systems (the In-

stant Ocean people) products from: UNDERWORLD PRODUCTS, Units 1 & 2, Belton Road West, Loughborough, Leicestershire LE11 0TR (Tel: 0509 601 310 Fax: 0509 610304).

#### HILLIAN INTERLOG

If you can cast your mind far enough ahead (or have sufficient imagination) to spring and summer days, what could be more pleasant than sitting around a small pool in the garden?

If you haven't got a pool, then you can make one, complete with seats too, in around ten minutes (plus filling time)



the adult either; for instance, the fry of the Honey Gourami (*Colisa zota chana*) are easier to feed than that of its larger relative, the Dwarf Gourami (*Colisa lalia*).

Again, some adult fishes develop a nourishing mucus on their skin on which the fry graze in the early stages of life. With these species care must be taken to ensure the parents are also in the best of health and well-fed, too (and left in with the fry, of course!). The time to feed egg-layers fry is after they have absorbed their yolk sac and are free-swimming. At this point it is vital that they can obtain food at all times: leave a dim light burning over the fry tank to encourage round-the-clock activity and feeding. If food is provided too early, there is a real possibility of polluting the aquarium and, of course, depleting the oxygen levels.

First foods for fry come in many guises, both manufactured proprietary brands and hobbyist-cultured live foods. Manufactured fry food include

liquid foods, powdered and crumbled flake, especially formulated for rapid growth (crumbled-up normal flake may be readily taken, but it will not necessarily have the same effect on growth rates).

Liquid and powdered foods are available in alternative particle sizes and different 'recipes' for livebearing and egg-laying species. There are other liquid foods based on various preserved live-food or vegetable ingredients. In addition to providing actual nourishment for the tiny fishes, some foods also actively encourage the development of plankton-like life in the aquarium water.

Natural foods range in form from liquid (green water or now outdated 'infusions'), microscopic aquatically-based live foods up to small-sized cultured worm food. The best-known cultured live food for fry is Brine Shrimp, *Artemia salina*, which can be easily hatched from either the traditional dry-stored eggs or from the more recently-developed

shell-less cysts. Care should be exercised to match the correct size of Shrimp to the size of fry. There is some appreciable difference in size (as far as fry are concerned) between San Francisco and Great Salt Lake newly-hatched nauplii — those from San Francisco are smaller. Feeding over-sized shrimps may result in the fry starving.

Another recent introduction for first-foods for fry has been Rotifers: these can be hatched and raised in almost astronomical numbers using algae cultures. One advantage of using Rotifers is that, although they may be used for feeding freshwater fry, they are eminently suitable for marine fishes' fry, whose reports of hatchings seem to be on the increase, in sympathy no doubt with the increase in this area of the hobby.

Minute aquatic live foods such as Cyclops, *Daphnia*, etc can be caught from the wild but, while these help to fulfil a much-required nutritional role, they must be carefully screened

to prevent the introduction of predators.

'Worm type' foods are reasonably easy to culture (although temperature plays a big part in success or failure) and, if you can bear it, then shredded earthworms are also excellent foods for fry that can cope with these larger particles.

Judging how much to feed is important. Rather than quote 'a little and often', resorting to examination with a magnifying glass will show better how the food supply is working out; the fry's stomach should always be full!

It is also important that you do not keep the fry on the same size-level of food too long: try to 'upgrade' the size to larger foods as soon as the fish will take them; this will help maintain the rate of growth.

Water changes should also be rigorously carried out (sponge filters are safest for fry tanks) to keep pollution from 'food leftovers' down to a minimum.



without any digging, plumbing or the need for special tools. The HILLIAN INTERLOG system makes construction simple: components quickly interlock together, a pool liner is fitted, seating planks are added and the pool filled.

The basic concept is easily adapted to make other garden 'furniture': over the pool a Wishing Well and Trellis transforms the structure into a major garden feature. Instead of water,

the simple pool 'enclosure' can be filled with sand for a play area or, used on its own, fitted around a tree trunk to make a shady garden seat. Planters or indoor gardens and fountains are yet more ways to use the Interlog idea.

A colour brochure is available from: HILLIAN INTERLOG LTD., Eagle House, Oakwood Lane, Port Talbot, West Glamorgan SA13 1DF. (Tel: 0639 684139).

## KING BRITISH

"If you've got it — flaunt it!" used to be a familiar phrase, and we're all only too aware of the advertising material coming at us from all directions. Now, you can tell the world about your aquatic interests by using one or two car window stickers from KING BRITISH. The 'I LOVE MY TROPICAL FISH' and 'I LOVE MY POND FISH' legends will not only let people know that you are a fish-mut (or have fish in transit) but will help

to spread the word about the hobby, thus helping aquarists and the Trade alike.

The stickers are free, so write off to KB for some for your Society members (please be considerate and enclose a sufficiently large S.A.E. if you are ordering in this manner). KING BRITISH AQUARIUM ACCESSORIES CO LTD., Hayfield Mills, Haycliffe Lane, Bradford, West Yorkshire BD5 9ET. (Tel: 0274 576241/573551).



# Coldwater jottings



Stephen J. Smith

## Variations on a theme

Regular readers of *Coldwater Jottings* may remember that I featured a filter system in these columns over two years ago (June 1986), designed by Northern coldwater aquarist Jack Larter.

Jack's system has produced a great deal of ongoing interest, and this latest variation is suggested by regular correspondent Leslie Johnson of Plymouth. Les writes: "This is based on a pond filter design and utilises a Mothercare sterilising unit for the main box."

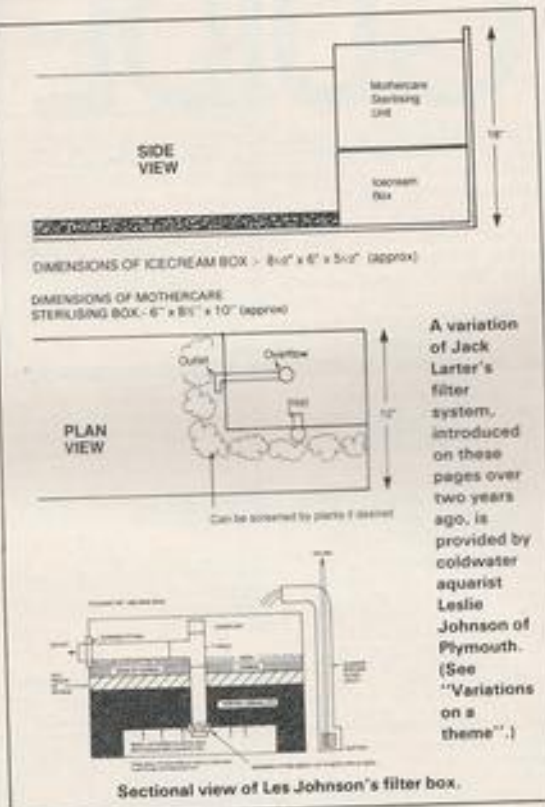
He continues, "The idea came from the need for a portable filter and cost only 50 pence to make — the box was purchased at a car boot sale, while odd pieces of scrap were used for the remainder."

The system is powered by a standard airpump and has, apparently, proven extremely effective for a tank of Fancy Goldfish.

"I undertake partial water changes every two weeks," added Les, "and the filter wool needs to be rinsed every so often. That is all the maintenance it needs, and the beauty of it is that the filter is portable and easy to dismantle."

## Goldfish on show

A great deal of enthusiasm was shown in the Fancy Goldfish display which I presented



A variation of Jack Larter's filter system, introduced on these pages over two years ago, is provided by coldwater aquarist Leslie Johnson of Plymouth. (See "Variations on a theme".)

at last October's Brighton Festival of Fishkeeping.

The festival provided the perfect forum for visitors to see — in many cases for the first time — some of the Goldfish varieties which enthusiasts sometimes take for granted.

As an example, just about every visitor to the Goldfish stand remarked on the, to them, "unusual" hood development of the Orandas on show; while the lesser-known varieties, such

as the Pearlscale and Jikin, also produced keen interest.

Which only supports an ongoing question: "Why do so few retailers make good quality Fancy Goldfish available to the public?" Perhaps, as the Brighton experience suggests, few people realise such animals exist. But, maybe if more retailers were to offer fancies, more people would become aware of them, thus increasing demand...

## A question of balance

As I pointed out in my reference to last year's Sandown Park exhibition (*Coldwater Jottings*, October 1988), one of the commonest "problems" faced by coldwater fishkeepers is that of overcrowding.

My subsequent comment was slightly misunderstood by some readers. It read, "Somehow, there exists a dangerous myth that two dozen Goldfish can survive quite happily in a twenty-four inch aquarium, fed three times a day with only occasional maintenance!"

I stand by those words. The myth does exist and it is dangerous. Visitors to the various exhibitions I support will have noticed that, for example, when I display my Fancy Goldfish, no more than four or five specimens are displayed in a three-foot tank — indeed, as is the case with my larger Orandas, only two are displayed in one aquarium.

My personal "rule of thumb" for the permanent quarters of my fish, is to allow only one adult fish for each square foot of water surface area. Thus, the fish are given every opportunity to develop to their full potential.

As I have often stated: "Far better to have just two thriving fish in a three-foot aquarium than two dozen suffering in a twenty-four inch tank."

## Greetings

Finally, my belated seasonal greetings and best wishes for the New Year are extended to all readers of *Coldwater Jottings*. Have a great fishkeeping 1989.

## FRED THE PIRANHA.



ELIZABETHAN TRANSLATION: ① BURE 6971 ② YOU REARED. ③ ARE YOU TAKING THE PILLER, PAL? ④ WE'RE TAKING G-BEE. R.