

The NEW

# AQUARIST & PONDKEEPER

JUNE 1996

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The Better Fishkeeping Magazine



## INSIDE

**STUART TURNER COMPETITION  
TETRA COMPETITION**

## PLUS

**PREVIEW OF  
HAMPTON COURT PALACE  
FLOWER SHOW**

## ALSO

**Free Supplement  
PRACTICAL  
WATER GARDENING**





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JUNE 1996 VOL 61 NO 3

## AQUARIST PONDKEEPER

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### COVER PICTURES



MAIN PICTURE: GORDON WIGENS  
INSET PICTURE: IGGY TAVARES

Ever optimistic that our weather will eventually get into its expected pattern, we are presenting a Practical Water Gardening Supplement which provides plenty of ideas for adding water to your garden in many guises and ponds proper to smaller (and safer) water features. This cover photograph should be all the encouragement you need to get started.

Every fish 'family' has its recognised favourites and the Tiger Barb, *Barbus tetrazona*, is just such an example. Even so, there are other colour strains available, too, thanks to the aquarist's skill and perseverance.

## Comment

One thing that fishkeeping does not suffer from is 'pedigrees'. That is not to say that there are no obviously quality-bred fish around but there are no registration forms to fill in, nor long, overly decorative names to invent (it also seems irrelevant when the family call the animal 'Rover' or 'Puss' anyway!)

Another feature of our wet interest is that you never know quite who you're talking to at exhibitions and shows — they could be a Company Director or a Lollipop Lady for all you know. Fishkeeping allows everybody to participate at whatever level they want to (finances allowing, of course) and the social scene is simply great.

Naturally, there is some rivalry between competitors at fish shows (thank goodness for that) and this necessarily extends into the trade side where Companies strive their best to keep ahead of the opposition. In our own sphere, we are quite happy to face up to the challenge of attracting, and keeping, readers and whilst acknowledging that having competition does keep us on our toes we genuinely mourn the demise, or decline, of any aquatic publication that would otherwise help to maintain the interest in our hobby.

How sad, then, to see at the recent Petindex Exhibition what can only be deduced as a whiff of 'politics' creeping in when, in the face of many new equipment products on display, the top award went to an artificial Water-lily. Maybe consolatory messages outweighed the congratulatory but let's acknowledge the winner all the same, otherwise we'll be accused of bringing another feature into fishkeeping — bitchiness — which brings us almost back to where we came in.

EDITOR

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# TIGER BARBS

IGGY TAVARES, PHD, HAS FOND MEMORIES OF HIS FIRST ENCOUNTER WITH THIS AQUARIUM FAVOURITE.

• PHOTOGRAPHS BY THE AUTHOR •

**M**any years ago, I restarted my fishkeeping exploits by setting up a community aquarium. There are a whole range of Barbs to choose from, but at the fish shop I was instantly attracted to the Tiger Barb. Having read many fish books I knew that Tiger Barbs have a reputation for troubling other fish species unless they are kept in a shoal. When there are a minimum of six Tiger Barbs they usually confine their fin nipping to their own kind. I bought six and got endless hours of pleasure from watching the antics of the playful, boisterous Tiger Barbs.

*Capota tetrazona* (Bleeker, 1860), the Tiger Barb comes from Sumatra and Borneo, two large islands in the Indian Ocean. The wild-type Tiger Barb is a deep bodied pink fish with four vertical black bands, one running through the eye. It can reach 3in (7.5cm) in total length. Males tend to have more colourful fins and a cherry red nose, while mature females tend to be plumper. A number of colour mutations of tiger barbs are now available. Several albino varieties of Tiger Barb have been produced, one where the cross bands are white and another these bands are hardly noticeable (Blushing albino, Hong Kong type). Another strain

popular in England is the moss-green variety. In this strain, the black bands merge together and give of an iridescent green sheen. I have yet to see any long tailed varieties of the Tiger Barb. I must say that the wild-type Tiger Barb is my favourite and I would never consider purchasing any of the mutations, simply because I feel that this original cannot be bettered.

## AQUARIUM MAINTENANCE

I maintained my small shoal of Tiger Barbs in a three foot tank, which they shared with shoals of Zebra Danios and Harlequins as well as spawning pair of *Laetacara curvipis*. Tiger Barbs are infamous for their fin-nipping of slow moving, long-finned species such as the Siamese Fighter, Guppies and even Angels. I never had any problems in my set-up, since most of the other species were fast swimming shoaling fish. Fortunately the Tiger Barbs never bothered the *L. curvipis* pair, but although the cichlids spawned frequently, no fry ever survived for

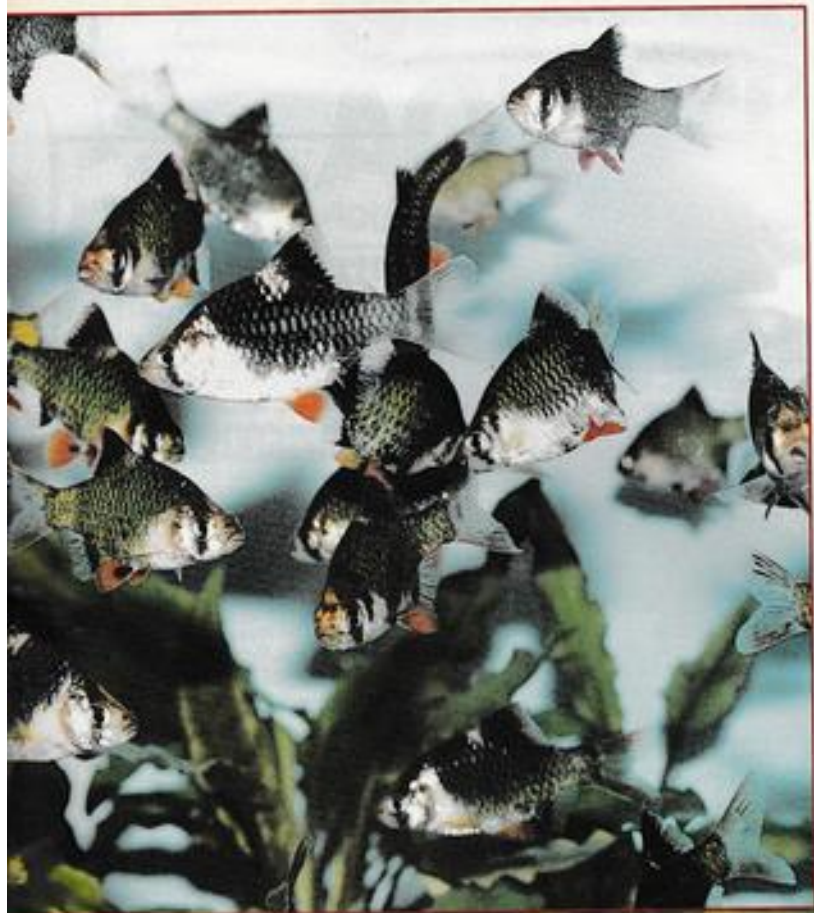
long in this tank.

Temperature was maintained at around 24°C and the water kept clean by an undergravel filter and an air pump, with partial water changes every two weeks or so. The Tiger Barbs and all the other species, happily took Tetramin Flake which formed their staple diet.

## BREEDING

The female Tiger Barbs would regularly fill up with eggs and I would often see them spawning among the plants. The male and female barb would come together side-by-side, with the male usual throwing his tail over the female's back and grasping her, while she released her amber coloured egg. The eggs made a ready feast for other fish in the aquarium. One while cleaning the aquarium, I looked at the underside of my aquarium. I was surprised to see





## TIGER BARB FACT FILE

**Scientific Name:** *Capoeta tetrazona*

**Common Name:** Tiger Barb

**Distribution:** Borneo and Sumatra

**Size:** Male and female 3in (7.5cm)

TL

**Footnote:** Within the popular aquatic literature, the Tiger Barb is referred to by several generic names — *Barbodes*, *Barbus*, *Capoeta* and *Puntius*. Most European hobbyists settle for *Barbus* whilst New World aquarists seem to prefer the others.

**LEFT**

A shoal of moss green Tiger Barbs showing a lot of green.

**BELOW**

Tiger Barb wild type.



small Tiger Barbs swimming around under the under gravel filter! Some of the eggs had obviously got sucked through the gravel and under the filter. Here they had hatched and were living off any food scraps which came their way. These small fish were siphoned out via the uplift tube, reared in a small tank, and turned out to be fine Tiger Barbs, none the worse for their start.

However, the usual way to breed the Tiger Barbs is to separate the sexes, while feeding them heavily for a week or so. Females fill up with roe, and males can then be introduced to initiate spawning. The aquarium should contain soft water and fine leaved plants for the best results and large numbers of fry, although my success was in hard water.

When spawning is complete, the barbs must be removed as soon as possible in order to prevent them from eating their own eggs. The latter, hatch in about two days and the fry are free swimming in another four to five days, at which time they can be fed on powdered Tetramin

and newly hatched brine shrimp.

They do, of course, need to be moved to larger tanks to keep them growing well. Your local fish shop will usually be glad to take them off your hands when they reach a size of about 1/4in.



## TROPICAL *Tiger Barbs*



Tiger Barb — Albino.

### AQUARIUM CARE

Aquarium size: 36x15x12in  
(90x37x30cm)  
Aquarium decoration: Well  
planted tank  
Temperature: 26°C-28°C  
Water: Soft water preferred (pH  
below 7.0, 10°DH  
approximately)  
Diet: Tetramin flake, some live or  
frozen food

### CONCLUSIONS

Tiger barbs are an active, colourful fish will add sparkle and life to any community aquarium. Tiger barbs must be kept in a shoal of at least six to retard their fin nipping tendencies, since they then spend all their time chasing each other. Tiger barbs are a hardy fish, eat all offered food, and are a joy to have.

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# SHORE WATCH

## An ABC of



BY ANDY HORTON

# Rockpooling

June is the most problematical month in the whole year for forecasting what is likely to be found on the shore. Many of the intertidal breeding fish like the Blenny will have returned to deeper water. Young fish will be found in the pools. The shrimps will be at the end of their life span, but the large edible-sized prawns are not yet likely to have moved in en masse from offshore.

On Sussex shores the presence of plankton blooms of *Phaeocystis* can colour the water brown and the fauna can be disappointing. South-western coasts are usually worth a visit, but even the richest shores can be surprisingly sparse after a period of unfavourable weather.

the weed gets washed up on the shore. Kelp forests are an important and biodiverse marine habitat.

The **KELVIN SCALE** is the measurement of colour temperature in units of °K. This scale is used in colour photography with standard colour films balanced at 5500°K, which is the same as natural sunlight. Light with a low value has a red cast and light with a higher value appears blue. Red light is absorbed first in the sea. Lighting in marine aquaria looks best with values higher than natural sunlight. Ordinary tungsten bulbs produce light at about 2800°K.

The **KEELWORM**, *Pomatoceros triqueter*, is a small worm that constructs limestone tubes on rocks on the shore and in deeper water. It feeds with a display of red or blue tentacles that need to be viewed with a magnifying glass.

The **KILLER WHALE**, *Orca orca*, is a toothed whale of the family Delphinidae found in all the oceans of the world. The best time to see these marine mammals in the deeper seas off western Britain is between April and October.

**KINGDOM** is the highest category in taxonomic classification. There are five kingdoms of Monera, Protista, Fungi, Plantae and Animalia.

A **KNOT** is a unit equal to 1 nautical mile per hour. This is 1.15 mph.

**KRILL** are well known as the food of the large baleen whales. This is the euphausiid *Euphausia superba* which is about half the size of a brown shrimp. This crustacean is not found in British seas, where there are 15 species of euphausiid found offshore. They are about 50 mm long and an important food for marine fish.

**KYMATOLOGY** is the study of waves.

The top of the kelp forest can be seen in the shallow sea at low tide.

PHOTO: ANDY HORTON

## k

**KELP** is the common name given to members of the Laminariaceae family of the largest brown seaweeds called Laminarians. Two large species found nearshore in British seas are *Laminaria digitata* and the Darweed *Laminaria hyperborea*. Both species are so large and buoyant that storms can uplift their attachment rocks so that







**L** The **LABRIDAE** are the family of fish known as the Wrasses. A **LAGOON** is a permanent body of water which is partly or completely separated from the sea by a strip of land. Around the British coast, lagoons will be brackish with salinities below 3.0‰.

The **LAMINAR FLOW** is a term used for the smooth (not turbulent) movement of gases or water.

**LAMPHELLS** belong to a phylum called the Brachiopoda that evolved up to the Jurassic period. They were replaced by the bivalve mollusc and are now restricted to deep water habitats with a few species still recorded in British seas.

The **LATERAL LINE** runs from the head down the middle of each side of bony fish and is used as a sensory organ to give the fish information about water vibrations which it can use to detect prey and to avoid predators and obstacles.

**LARVAE** are the young stages of fish and invertebrates, after hatching and before maturity.

**LEEWARD** means the side sheltered from the wind. These habitats are often more conducive to rock pool life.

The **LENGTH** of an organism is a frequent cause of misinterpretation. In scientific and fishkeeping circles a fish is measured from the tip of its snout to the beginning of the tail fin. A crab is measured from between its eyes to the rear of its carapace.

**LIAS** is a geological epoch in the Jurassic period. Limestone rocks on the Dorset coast were laid down about 200 million

years ago and yield a variety of marine fossils including ammonites and belemnites.

**LICHEN** is an organism made up of an association of microalgae or bacteria with fungi. Some species are to be found in the splash zone on rocky shores.

**LIGHT** is extremely important in the sea. It is essential for photosynthesis at the beginning of the food chain. The amount of light effects the behaviour, migrations and sexual cycles of fish and invertebrates.

In aquaria it is the intensity and duration of light that is important. Light levels are measured in lux. Snakelocks Anemones, *Anemonia viridis*, with symbiotic algae may require levels at 4000 lux to survive in the long term (over 6 months), but rock pool fish from British seas may only require 250 lux. Tanks should not be kept completely dark and a minimum of 15 lux is required to stop some free swimming fish from panicking.

Most British rock pool fish and invertebrates survive quite happily in tanks with two 40 watt fluorescent lamps. With the smaller tanks even this level may result in the growth of unwanted microalgae.

**LIMPETS** are a conical mollusc of the class Gastropoda. They are very important rocky shore grazers of the early growths of seaweeds. Shores where limpets have been killed by oil pollution show excessive weed growth.

**LINNEAN** pertains to the Swedish naturalist Linnaeus who was the originator of the Linnean system of biological classification in use today. The Linnean Society of London is a learned natural history society,

*If a worm is living in the keeled tube, it will emerge to feed when it is immersed in water.*

PHOTO: ANDY HORTON

**LITHIC** pertains to rock, e.g. epilithic, growing on rocks.

**LITTORAL** means the shore, the Littoral Zone being the Intertidal Zone, although misleadingly the Sublittoral refers to sea above the Continental Shelf below the low tide mark.

**LITTORINA** is the genus of snail-like molluscs called winkles.

**LIVE FOOD** refers to living organism fed to fish and invertebrates in aquaria. Many species like the seahorses feed exclusively on live prey of larvae and small prawns.

A **LIVING FOSSIL** is a species that evolved in its present form at a time when fossils were laid down in the geological record e.g. the Coelacanth, *Latimeria*, from the Indian Ocean.

The **LOBSTER** is a large decapod crustacean. There is a single British species, *Homarus gammarus*, which is blue when alive.

**LOCOMOTION** is the method of movement of an organism. Fish swim in a variety of ways; some like the Tompot Blenny, *Parablennius gattorugine*, propel themselves forward by

undulating their whole body, whilst others like the Mackerel just flex the caudal peduncle or rear part preceding the caudal or tail fin.

**LONGEVITY** of a species refers to the average life span in a habitat, e.g. in the wild, or in captivity.

**LONGSHORE DRIFT** is the movement of shingle or sand along a coast driven by the waves. Erosion is prevented by the construction of groynes and other sea defences.

**LOW TIDE** is the twice daily period when the tide recedes and uncovers the shore. (See Tides in the forthcoming October 1996 issue).

The **LUGWORM**, *Arenicola marina*, lives in a burrow on sandy shores. Its presence is revealed by distinctive casts of sand.

**LUMINESCENCE** is the emission of light by life forms, also called bioluminescence. An oar splashed into a sea inlet on an overcast day can reveal the silvery phosphorescence of millions of planktonic plants.

**LUNDY ISLE** is the first British statutory marine nature reserve in the Bristol Channel.

**LUSITANIAN** is the Latin name for Portugal. Lusitanian Fauna is marine life from a zone south of the British Isles reaching its northernmost point of distribution in the English Channel and south-west seas of Britain.



*Limpets are very common on rocky shores the length of the British coast.*

PHOTO: ANDY HORTON



June is the month containing the longest day. This probably means many evenings will be spent by the pondside admiring our lovely fish. I hope that my new pond will be up and running by now and, hopefully on a hot summer's evening, I will be relaxing with friends by the pond, with glass in hand, as reward for a hard days effort. For me this is the lighter and very pleasurable side of the hobby of Koi keeping. Another part of the hobby is visiting the Koi shows that are held around the country on most weekends throughout the summer months; it is the time when Lyn and I meet with friends whom we would seldom see otherwise, look at some great Koi in the show ring and talk, talk, talk Koi. Much can come from a visit to a show, apart from the social aspects as mentioned above. By close observation of the Koi in the show vats our appreciation will develop and the next time we consider buying a new pet for the pond our eye will be that much more knowledgeable. Much credence is placed upon body shape, skin quality and colouration, etc and the show scene is the ideal place to see just how the good differ from the less good. Observing two Sanke, say, in different vats is difficult but, with the Japanese method of judging, where competing Koi are placed in the same vat alongside each other, then the quality

differences will be more readily ascertained and our appreciation improved.

The June show scene should satisfy most Koi keepers (both visitors and exhibitors) in the UK with five shows notified and taking place from Leeds in the North to Billericay in the South East and with the Middlesex & Surrey Borders Section holding their show this year indoors at Kempton Park Racecourse. Please remember that if you are entering Koi into a show then it would be prudent to cease feeding your collection at least three days before the event; five days would be preferable. The reason for this is to minimise the amount of waste produced by your fish such that it will at worst only slightly pollute the water in the show vat into which it has been placed. Quality of water in show vats will be kept high by a team of people dedicated to this task for the period of the show but we are each responsible for the water quality in our own ponds and, particularly at this time of year, it should be monitored closely. Feeding will be at its peak and waste produced commensurately high. If heating is employed in your pond system give consideration to having it maintain a minimum of 20°C (70°F) through June, July and August (longer if possible) to ensure a good stable period for growth and health of your Koi.



DAVID TWIGG'S

# KOI CALENDAR

## 1996 SHOW CALENDAR

### JUNE

- 1/2 Yorkshire Section BKKS. Open Show at Lotherton Hall, Leeds. Contact Phil Swallow on 01422 343674  
15/16 Crouch Valley Open Show. Barleylands Farm, Billericay. Over 3,000 people are expected over the two days of this show that is expected to attract up to 30 dealers who specialise in fish, or fish-related dry goods. The show, housed within modern steel framed marquees, is considered one of the best on the circuit. Contact Vic Boreham, 01268 524232  
16 Northants Section BKKS. Closed Show at Kennelys Garden Centre, Doddington, Wellingborough. Showground is just off A45 and only four miles East of Billing Aquadrome. Contact John Byles on 01604 718648  
29/30 Middlesex & Surrey Borders. Indoor Open Show. Kempton Park Racecourse, Sunbury. 20+ dealer Stands for the Koi keeper as well as Bouncy Castle, Swing Boats, Shooting Gallery and Face Painting for the children. Mobile catering units will be on site and a full indoor Restaurant facility will be serving snacks and all day breakfasts, etc. The bar will be open for the full two days. Contact Cynthia Hudson on 01372 453215  
30 Suffolk & North Essex Section BKKS. English Style Open Show. Langham Community Centre, Nr. Colchester. Contact Mavis Carter, 01206 866011

### JULY

- 7 South Wales Section BKKS. Closed Show. Pughs Garden Centre, Morgenstown, Nr Cardiff. Koi and Bonsai dealers attending. Contact Keith Horwood on 01222 540775

### AUGUST

- 4 Yorkshire Koi Society Open Show. Harewood House, Leeds Contact J.A.Thomson 01723 864867  
10/11 BKKS National Show. Billing Aquadrome, Northampton. Contact Lou Jackson on 01322 463669  
25/26 South East Section BKKS. Open Show at Ravenswood School, Oakley. Contact Alan Maskell on 0181 6985779

### SEPTEMBER

- Leicestershire Section BKKS. Annual Show at Stoughton Farm Park. Contact Mick Reffin, 0116 2712517  
29 Northern Koi Club 4th Annual Open Show (Japanese Style). Cascade Water Gardens, Radcliffe, Manchester.  
Preceding this Sunday show on the Saturday afternoon, 3-5pm, is a celebrity speaker. Further details from Tony McCann on 0161 794 1958

My thanks go to all Koi club Secretaries or PROs' and others who send me their latest calendar for inclusion in this column. Although I do my best to ensure all events are mentioned it may be that some information, which arrives a little late, misses my deadline. Ideally I need to have information at least 10 weeks before the date of the event to guarantee publication. You may of course ring me direct on 01926 495213 or fax on 01926 403500, which will allow a little leeway. This request also applies to dealers with special events, auctions, etc. I look forward to hearing from you.

All Koi keepers are welcomed to the events mentioned in this calendar (an entry fee may be payable). Further details can be obtained from the contact telephone number quoted alongside the diary entry.

Please write to me at your earliest convenience via the Editor at MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent, TN24 8ET. Thank you.



# BACK TO THE FUTURE?

**NICK DAKIN FINDS AN OLD FILTRATION METHOD THAT APPEARS BRAND NEW.**

• PHOTOGRAPHS BY THE AUTHOR •

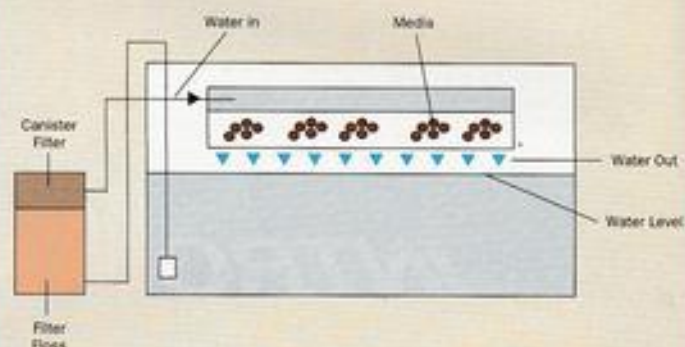
**Y**ou may be wondering just what an article concerning 'modern' trickle filtration has got to do with a title like 'Back To The Future'. In fact, more than most people are aware, for trickle filters are not a recent invention as some would have us believe. Indeed, they have been processing human waste in this country since the turn of the century! Yes, the good old British sewerage farm was using the technology well over 90 years ago (albeit on a very small scale and to a rather elite few, but nevertheless it did exist). It is only relatively recently that the techniques have been adapted for use in the aquarium, and in particular the marine aquarium.

So, how do trickle filters work in the aquarium? The process is surprisingly simple and not completely unrelated to that which we have already previously discussed in this series. Water, containing various nitrogenous compounds (i.e. ammonia and nitrite) is trickled or sprayed over a bacteria-friendly media, usually inert coarse granules or plastic 'shapes'. As it makes its progress through the media, aerobic (oxygen-loving) bacteria utilise the dissolved substances as food and convert them into less toxic substances. Nitrosomonas bacteria convert ammonia into nitrite and Nitrobacter bacteria convert the nitrites into nitrates. Yet another bacteria can be called upon to convert nitrate into free nitrogen gas, but this can only be achieved under anaerobic (oxygen-free) conditions and is not usually encompassed by the term 'trickle filtration'.

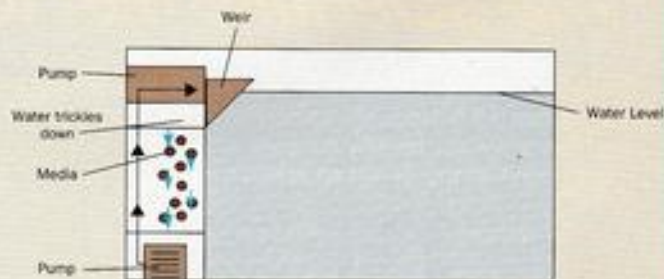
The beauty of trickle filters is that they are far more efficient than normal undergravels, whether downflow or reverse-flow. Again, the

## TRICKLE FILTER DESIGNS

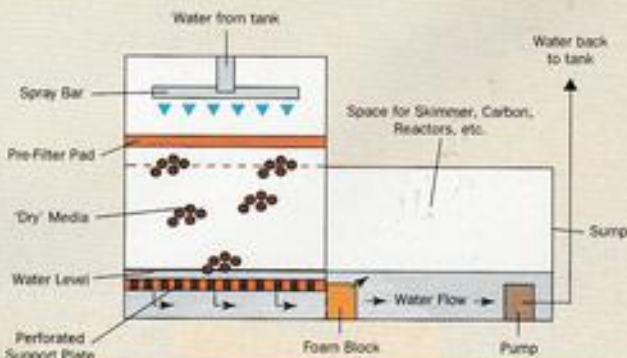
(1) ABOVE THE TANK



(2) INTERNAL/INTEGRAL FILTER



(3) EXTERNAL BELOW THE TANK





**RIGHT**  
Filtration for  
90x26x26in ALS  
T-3000 filter,  
skimmers, etc.

**BELOW RIGHT**  
Trickle Filter.

reasoning is very simple. Useful Nitrosomonas and Nitrobacter bacteria require access to copious quantities of oxygen to perform their tasks efficiently; with undergravels the friendly bacteria can only call upon the available oxygen dissolved in the water. If this is low then the bacteria count will be correspondingly low, making the filter far from efficient. Trickle filters, on the other hand, have access to unlimited supplies of free atmospheric oxygen and the bacteria can not only perform their functions at peak efficiency but have a favourable environment in which to multiply massively. The only limiting factors would be volume of media and amounts of nitrogenous food. Some years ago, my own experiments led me to conclude that trickle filters could operate up to twenty times more effectively than undergravels, especially if designed and operated correctly. Needless to say, such improvements, where marines are concerned, must be cause for very serious consideration.

This is not to say that undergravel filtration should immediately be disregarded or seen as unworkable. On the contrary, it has proved the mainstay of the hobby for many years and I dare say will still be around for a good number of years to come. In fact, many aquarists use a combination of undergravels and trickle filters on the same tank with exceptional results.

There are four main types of trickle filtration design: above the tank, internal, externally below the tank, and specialised trickle canisters.

## TRICKLE CONFUSION

Trickle filters are seen by many as 'high-tech' and complicated, much in the same way as personal computers were regarded when they first hit the market. Nothing in fact, could be further



from the truth. With all the information to hand, installation is usually very straightforward. However, there are a number of frequently asked questions that occur to potential purchasers and these can easily be answered.

**(Q)** Trickle filters are expensive, aren't they?

**(A)** Not really. Many systems now compare very favourably with the prices of full undergravel filtration. It is well worth pricing up both systems before making any decision, the outcome can be very surprising!

**(Q)** Is it worth fitting a trickle filter to a small (say 3ft) tank?

**(A)** Undertank trickle filters are probably only cost effective on tanks of 4ft+ and I would tend to support smaller aquaria with an over-the-tank model whilst still relying on an undergravel.

**(Q)** Does it matter if plastic, ceramic, inert granules, coral gravel or sintered glass filter media is used?

**(A)** Each model will come with a recommendation from the manufacturer as to what media works best for their product and this should be followed for best results. However, most of the media mentioned is perfectly acceptable in many cases.

**(Q)** Is a trickle filter a good excuse to increase fish stocking levels?

**(A)** Absolutely not! Trickle filters are an excellent method by which water parameters can be substantially improved. This advantage will be lost fully if extra fish are introduced.

**(Q)** I have been told that I need not carry out any more water changes if I install a trickle filter. Is this true?

**(A)** Certainly not! A 15%-25% water change every two weeks should be standard practice for every tank whatever the filtration. By foregoing water changes, much of the advantage of trickle filtration will soon be lost.

**(Q)** Will nitrates be reduced or eliminated by a trickle filter?

**(A)** No. A separate denitrifying filter will be required to perform that function. There is no reason, however, why such a filter cannot be housed in a trickle filter sump in many instances.

**(Q)** Is trickle filtration the

same as 'wet and dry'?

**(A)** On the whole, yes. The 'wet' part is where the media is fully submerged all of the time and usually found at the bottom of the design, the 'dry' part is the non-submerged media over which the water trickles. To make things even more confusing, some trickle filters do not have a 'wet' part!

**(Q)** Trickle filters are for reef tanks only, aren't they?

**(A)** Fish-only tanks benefit greatly from trickle filtration and it should not be seen as the exclusive domain of the invertebrate keeper.

## THE OTHER SIDE OF THE COIN

Whilst trickle filters are undoubtedly a great advantage to the marine fishkeeper, there are a number of weaknesses in the strategy that also need consideration.

### NEXT MONTH:

I WILL BE HIGHLIGHTING THESE WEAKNESSES AS WELL AS PROPOSING A VARIETY OF LIVESTOCK THAT CAN BE KEPT USING TRICKLE FILTRATION.



# TOMORROW'S AQUARIST

BY GINA SANDFORD



Last month I mentioned breeding fish in my greenhouse during the summer months and that set the mind wandering on to the things that substrate spawners lay their eggs on.

The name 'substrate spawner' sounds simple enough — fish that deposit their spawn on the substrate. Oh that it were so simple, for 'substrate' read 'anything that is remotely flat'. In the wild, this can include such things as rocks, the roof of a cave, a plant leaf, wood or a pit in the sand or gravel floor of the lake or river. In captivity, however, we try and think for our fish and also try to make life easier for ourselves by setting up breeding tanks. Then the list of spawning sites increases: aquarium glass, roofing slates, heater/thermostats, filtration pipework and flower pots (inside and out) are a few of the items utilised.

At one stage I was trying to breed angels — *Pterophyllum scalare*. I had bought two youngsters and by a strange quirk of fate they turned out to be a pair but, more importantly a compatible pair that spawned regularly in my community tank. Although they didn't eat the eggs but guarded them diligently, as soon as the eggs started to hatch and the fry were at the 'wiggler' stage everything else in the tank had a wonderful feast on them! I consulted the books ... remove the eggs and hatch in a separate tank ... the answer was simple.

I set up another tank with water from the main aquarium and made sure the temperature was the same, otherwise it was bare except for an airstone to provide a current over the eggs and an air-operated sponge filter. The next time the angels obliged by laying their eggs on the leaf of a large Amazon Sword plant (*Echinodorus* sp.), I cut the leaf off and transferred it and the eggs to the hatching tank. A quick look at the book suggested the addition of a little methylene blue to deter fungal infection. I weighted the leaf down with a clean (scrubbed under very hot

water) pebble, positioned the airstone so that water flowed across the eggs and added a few drops of methylene blue. That was it, I would achieve instant success and get a full hatching of fry that would all grow to maturity ... who was I kidding?

The parents had spawned on

majority fungused.

I determined that the best way to breed these creatures was in a specially set up tank into which I would put the parents to spawn. I carried out the necessary preparations and gave them a choice (my choice you note) of spawning sites — pot, slate, pipes — and placed

for this purpose, I use a 3in (7cm) plastic flower pot filled with aquarium gravel. I've tried clay pots but these leach calcium and harden the water which is fine for hard water species but not so good for those requiring softer conditions because, although the parents may spawn, the harder water may reduce the hatch rate considerably. Alternative plants are *Cryptocoryne* spp. These can also go into plastic pots but this time I use the shallower half pots and put five of six small Crypts into the pot. Bear in mind that it takes longer for Crypts to establish themselves and grow into a reasonable clump.

Growing plants not only make natural spawning sites they also help maintain water quality, they are a natural filter system. It follows, therefore, that they can also be used in quarantine tanks where they give cover for nervous fish.

As a final thought on breeding Angels, I read in one of the magazines (can't find the article in question — Murphy's Law strikes again!) a couple of months back, a theory that parents may eat the fry because they know that the young have some form of defect and this intrigued me. I had a question about parental care which came about because some pairs of captive bred fish from stock that had been captive bred for several generations, did not practice parental care to any great degree. The adults paired, cleaned a leaf and laid their eggs but there it ended, the pair bond fell apart leaving one to fend for the eggs and then the parent concerned seemed to have little idea what to do. It was as though they hadn't been taught. Sex came naturally but what they should do with the eggs was a total mystery. I began to question whether or not young fish learn from their parents' behaviour and, by constantly artificially rearing young fish remote from their parents, have we inadvertently broken the learning chain? Has anyone else any experience of this?



Silver Angels like to pick their own partners for spawning. Here a pair spawn on a leaf despite the attentions of other fish in the tank.

PHOTO: M. SANDFORD

a rather tatty old leaf of the Sword plant and, under normal conditions, that is the parents tending the eggs in situ, this would have made no difference but I stepped in and, without thinking, mucked up the system. I cut the leaf off and put it in the hatching tank and everything seemed fine but, in less than 24 hours, all was not well, the leaf was disintegrating. The book never said this would happen ... panic set in. But it was too late to salvage much and soon the eggs were scattered, still attached to bits of leaf, to all corners of the aquarium and, despite the methylene blue the

parents in the tank — nothing! They didn't want to know. In desperation I ripped up a Sword plant and stuck it in a pot. The angels spawned on a leaf! Again they had chosen one of the outer leaves but, with the whole plant there, it did not fall apart until after the fry were free swimming.

The plant took several months to recover from its undignified uprooting and it lost many leaves along the way. I determined that, in future, I would keep a couple of plants growing in pots ready for transference to spawning tanks should the need arise.

To grow Amazon Sword plants



# Hampton Court Palace Flower Show

PREVIEW



The Tetra exhibit at last year's show.  
PHOTO COURTESY OF TETRA.

The **Aquatics Village** has become a popular attraction for visitors to the Flower Show, partly because of its location alongside the Long Water where picnic lunches can be taken, but also it's where the water garden displays can be found. Here, exhibitors well-known both in gardening and fishkeeping circles combine to bring the best in water garden design and fishkeeping expertise. This year's line up will include the following exhibitors who have kindly given **A&P** a few words about their plans.

**ANGLO AQUARIUM PLANT COMPANY** are obviously on a conservation kick for their display having given it the title **Re-cycled** although, with the subject matter being how a neglected small area of water can be transformed into an attractive feature, is there a chance that any 'before' section might feature a rusty bike or a supermarket trolley? Whatever the outcome, you can be assured of a fantastic display of aquatic plants for in or around the pond.

**COUNTRYSIDE WILDFLOWERS** are hoping to present the quintessential English garden with **The House at Pooh Corner**. Mamey Hall told **A&P** that they intend to feature all the waterside, wetland and

meadow plants that they can — along with Piglet's House and Wol's House (they particularly asked the Organisers for a plot with a large tree!) For any Christopher Robin diehards, yes, you will have access to the entire garden and perhaps play a round of 'Pooh-Sticks' with your friends on the bridge.

**EBB AND FLOW** will combine high-tech with natural processes in their presentation **The Flowform Water and Herb Garden**. The collecting and distributing units in the water flow are designed to optimise the natural processes in their handling of water; water remains for the maximum amount of time (whilst still flowing) within the bowls and thus become aerated and cleansed in the computer-designed flow patterns which aids the self-scouring action. The adjacent herb garden should ensure that there will be a scent in the air too.

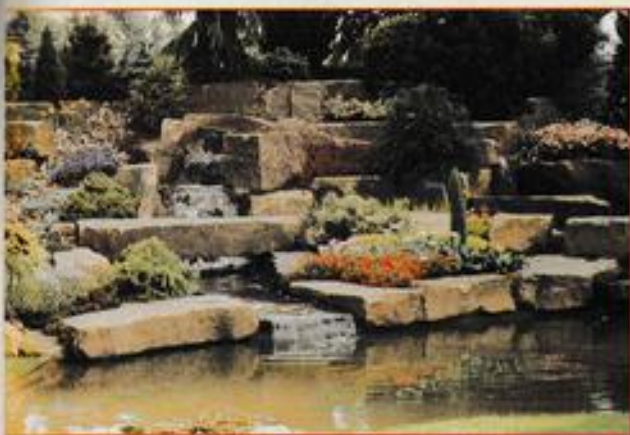
The **FEDERATION OF BRITISH AQUATIC SOCIETIES'** Exhibit has a long-standing reputation amongst regular Show visitors for reliable, practical advice on all manner of aquatic and water-gardening matters. This year its exhibit is entitled **Pool of Information** and reflects the wealth of advice available from its associates

including the **Aquarist & Pondkeeper** magazine whose Editor, Dick Mills, will be on hand throughout the Show, The Association of Professional Landscapers (Alan Sargent showing how to install pre-formed ponds), O'Clear (Aqua Company's Clare Stewart with advice on pond management, clearing green water and offering on-the-spot pond-water tests) and Bill Rundle, the FBAS President and plant expert. Also featured are decorative contributions by Chenies Aquatics and Anglo Aquarium Plant Company.

**LWL LANDSCAPES**, winners of last year's Gold Medal, are determined not to rest on their laurels and will be defending their title with vigour. A 12ft high waterfall, overlooking not only a grotto and large pool, ought to offer a magnificent vantage point from which to obtain a superb view of the Long Water. Unfortunately, mindful of the problems appreciative, but loitering, visitors would cause, LWL regrets that this display, entitled **High Waters** will not be open for access to the public.

You'll be able to see **King of the Pond** on the **TETRA** exhibit. This regal offering will feature some large and expensive Koi, some over 2ft long and valued at several





A selection of displays at the 1995 Hampton Court Flower Show.

PHOTOS: AAP LIBRARY

thousand pounds each. Keith Siddle, the renowned Koi Artist, will be creating another striking study of the Koi during the Preview Day (July 9) which will be the prize (worth around £1,500) in a Prize Draw; visitors can enter the Draw by making a donation to Tetra's nominated charity, the Whale and Dolphin Conservation Society, a cause already well-supported by the company's promotions in their products. You could also win a £3,000 holiday in the TetraPond Scratchcard Competition or buy a delightful 'Fine Art' Limited Edition Koi Calendar for 1997. Add to these attractions, the Tetra team of experts on hand throughout the Show to answer all your aquatic queries (indoors and out) and you'll find it difficult to go away empty-handed!



appeal to everyone as the design featuring twin waterfalls backed up by moisture-loving plants including Lilies can be installed both by professional landscape gardeners on one hand or alternatively by the DIY gardener, using readily available components.

Finally, what is the water garden without the movement of water? Each year the thing that brings the Show really to life is the constant movement of water in all directions, in every conceivable amount and in ever-increasing

displays — whether in the Aquatic Village or not. This has been made possible by the generous support and sponsorship of **GOULD PUMPS** who are, literally, providing the moving force behind any water displays throughout the whole Show.

The sights and sounds of water running wild is the theme of the **Rock and Water Garden** presented by **PETER TINSLEY**. Despite its natural look, much time and care have been taken to get just the right blend of stones, plants and water movement to make it look as if it wasn't man-made at all.

You shouldn't be too surprised to learn that the **WATER GARDENER** in association with Hadlow College, has come up with something quite artistic for this year's event. The aptly-titled **Water Colours** sets out both water and a multitude of colour in an imaginative design with the flower beds and pond based on an artist's palette.

Having a company name of **WORLD OF WATER** might be a drawback when designing a feature for public viewing as the possibilities for design appear to be endless, and knowing where to start or finish a debatable subject. John Went's **World of Water Feature** should





# Pond Diary

## JUNE 1996

Sun	2	9	16	23/30	
Mon	3	10	17	24	
Tue	4	11	18	25	
Wed	5	12	19	26	
Thu	6	13	20	27	
Fri	7	14	21	28	
Sat	1	8	15	22	29

### Susan Stephenson finds plenty of chores to do in and around the pond

June is a busy month for the pondkeeper as both plants and fish near the height of activity.

Fish will be preparing to spawn now and if you notice females becoming over harassed by eager males isolate them as this can lead to stress in the fish. If fish have spawned, separate the fry from the parent to prevent them being eaten.

Continue to remove algal growth but do watch out for young fish which may be sheltering there to avoid becoming a tasty snack for their parents. Blanketweed growth should become reduced as the leaves of floating plants spread and prevent excess sunlight reaching the depths. However if the growth of floating plants is excessive it should be controlled enough to allow sunlight to reach other underwater plants.

Watch for evaporation of water as the days grow hotter and longer, especially if you have waterfalls and fountains,

and top up as necessary using either a trickling hose or one fitted with a fine spray. This will reduce water temperature and will benefit in particular small shallow pools. Add new plants to the pond if you wish and build up the stocks of oxygenating and floating plants to encourage clear water.

Tender aquatics can generally be safely added now as there is only a remote chance of frost this month. If the growth of some of the plants appears sluggish boost them with fertiliser tablets.

Keep weeds, and unwanted seedling numbers, down in the bog garden by frequent light hoeing rather than use of

weedkillers and only use fertiliser if necessary now as any seepage of chemicals into the water must be avoided. To discourage new weeds and keep moisture in the soil put down a mulch of chopped bark or peat.

Be on the alert for fish parasites which will multiply readily in the warmer weather; treat with a specific medication if you can identify the problem, or obtain advice.

After thundery weather fish may lack oxygen; this can be overcome by allowing water from a hosepipe to gently splash into the pool to agitate the water, or you can leave the fountain on overnight if you have one.

Keep an eye out for aphids and deal with infestations as soon as they occur. If using pesticides, be careful where fish are present and always follow the manufacturer's instructions. Where infestation is not great, control can be achieved by pushing the affected parts under water and

weighting them with a plank to give the fish a live feed.

Control Chironomid midge (which can be a greater pest than aphids); it indicates its presence by reducing leaves of plants such as Aponogeton and Water Lilies to skeletons. This is very difficult although the same methods as for aphid control may be effective. In general, though, removal of all affected parts and destroying them is the surest way to ensure the infestation is controlled.

Prick out seedlings of February-sown Primulas in seed boxes ready for planting in September and divide clumps of *Orontium aquaticum* and re-plant if you wish.

Finish planting aquatics this month if you want a display in their first season.

June is a month when there is a lot to look out for (and a lot to do!) but with careful observation and work now the pond should be a major feature of the garden throughout the summer.



PHOTO: MP. & C. REDNOR

### Useful June Tips

(1) When spraying leaves to control aphids choose a hot still day and spray the leaves of the plant only. The aphids will die and die on the leaves without falling into the water and polluting it. The leaves can be removed safely then.

(2) Remember when introducing new fish to a pond to let them get used to the water temperature, in a floating bag before releasing them and if possible keep in a small separate pool for a few days to ensure no disease is present which could be disastrous for the other fish.

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# Growing Tips

BY BARRY R JAMES

## Planting the Aquarium

Last month I dealt with the "hard" landscaping of the aquarium. Now it is time to consider the selection and installation of the plants themselves. The diagrams show some suggested layouts. The degree of complexity will obviously depend on the size of the aquarium, in particular the dimensions of the base. The number of terraces will be determined by the width of the tank (front to back), a 12in wide tank will only accommodate one, a 15in wide whilst an 18in wide aquarium can have a maximum of three.

Avoid the impression of a museum collection with many species, as this not only looks unnatural, but is, in the wild one or two species dominate any particular ecological niche. In any case it is inclined to be self-defeating as most of the plants will tend to die out with just a few types surviving. Over the years when visiting aquarists' homes, it soon becomes obvious that *Cryptocorynes*, *Echinodorus*, *Sagittaria*, *Valisneria*, *Vesicularia* and *Microsorium* tend to survive as a monoculture. Most "leafy" species seldom last more than a couple of years. However leafy plants tend to add variety of shape and colour most of the survivor plants are inclined to have linear shaped leaves.

I find that it is better to fill the tank before planting just leave enough room to allow for the displacement volume of your arm to prevent spillages. Long roots should be trimmed back — most existing roots die off when re-planted. Dead or excess foliage should also be removed. Cuttings should be

trimmed back at the base and the lower leaves removed. Most cuttings root at the nodes so at least one node should be under the gravel. Up to five cuttings can be bunched together with soft lead strip, care being taken not to crush the stems. Planting is best done with the fingers, in my experience planting sticks are a waste of time. Tubers and rhizomes can be simply pushed into the gravel. Take care to plant them the right way up and leave the growing point exposed. Plants growing in rockwool in pots are best removed from their containers and most of the rockwool gently teased away from the roots before planting.

Most aquaria are meant to represent a small living community. The plants and hard landscaping act as the backdrop to the fishes. To this end the plants tend to form a semi-circle to leave a free-swimming area towards the front. In order to achieve this the taller plants will be placed around the back and sides. Plants which grow in the form of rosettes are placed towards the front, if they are small, or in the middle ground if they are to act as accent specimens. However a more fluid effect is created if these guidelines are not followed too rigidly.

A few bunches of taller plants set amidst medium growing species will take offset any tendency to formality. Certain plants such as *Microsorium*, *Bolbitis*, *Anubias* and *Vesicularia* can be attached and will grow on rocks and bogwood. This will create a charming and very natural effect and take away the

## A to Z of plants

### Ceratophyllum

*Ceratophyllum* is a small cosmopolitan genus containing just three species. They are submerged, rootless plants with the fine leaves arranged in whorls, somewhat similar to Milfoils. They are excellent floating plants for both pools and aquaria where they form tangled masses just below the surface. The flowers are inconspicuous and produce a tiny fruit which is technically classified as a nut.



LEFT IN PICTURE: *Ceratophyllum demersum*. RIGHT IN PICTURE: *Ceratophyllum submersum*.

PHOTO: BARRY JAMES

### *Ceratophyllum demersum* (Linne 1763)

**Common Name:** Hornwort.

**Description:** A harder plant and less brittle than the next species to be discussed. A native aquatic and an excellent oxygenator for the pool. However it will grow in tropical temperatures, becoming softer and more brittle. The colour varies from light to dark-green depending on growing conditions. If grown outside, Hornworts develop tightly packed buds at the apex in autumn. These 'turions' sink to the bottom and in spring develop modified leaves which anchor them to the bottom. The plant then grows upwards towards the surface. Later they break free from the bottom and form floating masses just below the water.

**Cultivation:** Hornworts demand clean water and strong illumination to succeed. The biggest problem is thread algae which infest the plants very quickly.

### *Ceratophyllum submersum* (Linne 1763)

**Common Name:** Tropical Hornwort.

**Description:** Very similar to the previous species. Imported plants from South-East Asia, where it is native, are very soft and light green in colour. The plants branch freely and often take on reddish tinges in bright light. An excellent plant for breeding certain species such as Anabantids.

**Cultivation:** As for *C. demersum*.

**Propagation:** By cuttings which break away naturally in nature and become independent.

**Note:** The only other species, *C. echinatum*, is native to North America and is not in cultivation in Europe.

starkness of these hard objects. These are best attached by elastic bands. In time the rubber will perish by which time the plants will have produced adventitious roots and attached themselves firmly.

Finally, a portion of a floating plant should be introduced. These will filter the light and are very helpful in keeping down unwanted algae as well as stabilizing the nutrient content of the water.



# Jackie's Juniors



Hi Junior Fishkeepers, it's time for some fun again. More jokes to amuse you and a fishy tale to solve. You can send in any funny stories as well; have a go at a fishy illustration or tell us about your fishkeeping. Don't forget those nice people at John Allan Aquariums are giving a prize for the best received: **DON'T DELAY — DO IT TODAY!** Don't forget your name, age, address and if you belong to a local Society when you write to me — Jackie Bradbury, c/o MJ Publications Ltd., Caxton House, Wellesley Road, Ashford, Kent TN24 8ET.

## ★ JUST FOR FUN ★



### HOW MANY FISH CAN YOU FIND IN THIS LITTLE TALE?



Christmas has been and gone. The angel took her plaice upon the tree. The dog watched the cat play with the bumble-bee. A Survival Special told us about the elephant, giraffe and zebra. Also shown were jaguars, panther and leopards. Dad stopped shaving for the

holiday and Mum called him a bristlehead. Grannie lost her glasses and Dad called her a blind cavefish. Mum went battle when Dad's tea went as cold as stone. We unpacked lots of boxes of presents and had a right festive time. Christmas dinner left us well bloated and puffer like. I was caught sword fighting with my dwarf of a little brother after calling him a pygmy. Dad whipped my tail and Oscar the parrot croaked like a demented frog. A drive in the car saw the head and tail lights fail us and another motorist flagged us down to offer us his hammer, but we used our sucker as a imitator for the screw we lost. We got to visit Auntie Molly before going home. Nearly back to normal now, after being upside down over the festive season.

ANSWERS: angel, plaice, cat, bumble-bee, elephant, giraffe, zebra, jaguar, panther, leopard, bristlehead, blind cavefish, battle, stone, festive, puffer, sword, dwarf, pigmy, whipped my tail, Oscar, parrot, croak, head and tail lights, motorist, flag, sucker, imitator, Molly, upside down.

## CRINGE CORNER

A huge fish knocks at the door and asks to see the piano. "Oh come in, you must be the Tuna!"

Patient: "Doctor, doctor, people keep thinking I'm a frog."  
Doctor: "I hope you haven't left any wet footprints in my waiting room!"

## DID YOU KNOW?

The shark produces an anti-coagulant which increases the amount of bleeding in its victims.

When highly-stressed, marine Boxfish give out a poison which can kill all the fish in the aquarium — including itself.

During his reign, King Henry I banned the eating of Sturgeon by everybody else excepting himself.

## MATCH THE NAMES

Can you match the Common Name to the Scientific Name?

1. Angelfish.
2. Swordtail.
3. Lionfish.
4. Archerfish.
5. Firemouth.
6. Pearl Gourami.
7. Silver Dollar.
8. Leopard Danio.
9. Four-eyes.
10. Bronze Catfish.

- A. *Trichogaster leerii*.
- B. *Corydoras aeneus*.
- C. *Pterophyllum scalare*.
- D. *Anableps anableps*.
- E. *Xiphophorus helleri*.
- F. *Brachydanio frankel*.
- G. *Pterois antennata*.
- H. *Myiosoma argenteum*.
- I. *Thorichthys meeki*.
- J. *Toxotes jaculator*.

ANSWERS  
1-C; 2-E; 3-D; 4-I; 5-F; 6-A; 7-H; 8-F; 9-D; 10-B

## CAN YOU NAME THREE FISH WITH NAMES BEGINNING AND ENDING IN 'K'?

Scoring — 1 point for each fish named (it's a place in Madock, Rhondda, N. Wales).

ANSWER: King Shark, King-Slave

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## TROPICAL *Discus are Cichlids*

once they have started to lay eggs they are impossible to halt. The way to delay a female laying eggs is to keep her in a tank with enough other fish to stop her getting territory of her own. If you have six or more fish this is relatively easy, but not so easy if you have just a couple. Females will start breeding (or at least start laying eggs) from as young as nine months old. This is not in any way a desirable situation because she will be nowhere near reaching her potential size and will not make good breeding stock.

(2) Male fish do not stop growing when they become viable breeders but, in the true tradition of Murphy's Law, they can take a year longer than females to become viable! Most Discus keepers that ask my advice on breeding tell me that they are having difficulty breeding their fish. They often think the male is sterile (it quite probably is). As many Discus keepers buy their initial stock at the same time, they expect the fish to become viable for breeding at the same time (and why should they think any different? — none of the popular books on the subject of Discus tell you this bit!). Don't forget you read it first in **Aquarist & Pondkeeper!**

In my view it is not worth building your hopes up with a male Discus as a breeding fish until it is at least 20 months old and even then they don't often get it right the first few times. I have a male fish that had eaten 15 consecutive spawnings and then "Eureka" one night I noticed eggs on the pot ... and the male was in one corner of the tank smoking a cigarette with a satisfied smirk on his face!! He is now one of the best breeding males I have.

The business of wire netting over the eggs or taking the parents away, etc., is, in my view, a purely commercial practice and is an attempt to make up for any shortfall the parents may have. You will

have much more pleasure from breeding Discus if you acquire a decent pair to start with, and the big secret is patience.

Before we actually broach the subject of breeding Discus, some thought, in fact, a great deal of thought should be put into the selection of breeding stock.

The first and most natural way is to let a male and female find each other out of a small shoal and let nature take its course. Assuming conditions are correct and a male and female fish have chosen each other they will breed with comparative ease and eventually they will produce fry. Again, as long as conditions are correct they make it easy, and rear their own young for the first few weeks, and then it is over to you and this is where it becomes more difficult. More about that later.

The second method is to artificially raise the young. By this I mean to let the female lay her eggs, then let the male fertilize them, then the parents and the eggs are separated and the eggs are hatched and reared artificially. I can assure you, to raise Discus artificially is a huge task which is incredibly labour intensive and requires virtual mini laboratory conditions. As with most things, nature makes a much better job of it than we can.



**ABOVE LEFT**  
First foods come from Mum and Dad ...

**ABOVE**  
... who take it in turns to provide 'meals on fins' ...

**RIGHT**  
... and don't the youngsters look well on it?



## ARTIFICIAL REARING OF DISCUS

I feel I should say at the outset of this section, WHY? I have never found the need to do so, and of the fish I have seen that have been artificially reared I would have to say they are nowhere near the quality of naturally reared fish. I personally feel that this is the main reason the Far East products such poor quality Discus. As far as I can understand there is only one reason for artificially rearing Discus and that is a commercial one, it certainly isn't the way to produce high quality fish. The reason for the lack of quality and vigour of artificially reared fish is the need of the hatching fry for trace elements and

various proteins. Probably the most important thing of all is the immunity that is naturally passed from parents to offspring. In my own experiments I would say artificially reared fry attain the same size in three months as naturally raised fry do in two months. These first weeks are the most important time when growth patterns are established. Quite frankly, I feel that Discus that can't or won't raise their own young are not fish worth breeding from anyway, as you would be breeding out the one thing that makes the Discus virtually unique.

## NATURAL BREEDING OF DISCUS

Discus need to be brought into condition to breed efficiently, and this can be done over a period of a month or so. It is done by providing optimum conditions and good quality feeding with Whiteworm, Beeheart and Bloodworm (not live under any circumstances). Adult Brine Shrimp, and best of all chopped Earthworms, the fish should be fed as much as they will eat during this period. A spawning substrate (spawning pot) should be placed in the tank if you have not done so. If you have a good pair of fish, usually, within a few weeks the male will start pecking and cleaning the pot, then the female will join in with growing intensity until, usually between 7pm and 11 pm they will lay the eggs, and with luck fertilise them.

At 86°F, the eggs will hatch in around 50 hours; you will see them grow darker over this period. The whole spawning will probably take about 10 hours to hatch fully which is when the parents will start moving them around by picking them up in their mouths and blowing them into small clumps. This goes on for another 50 hours until the fry will become free swimming and begin feeding from the side of the parents. If all has gone well, the parents will now be quite dark with mucus which will sustain the fry for the first couple of weeks. During this time the growth rate of the fry is nothing short of spectacular.

## PLEASE NOTE:

Some readers have been contacting me about the forthcoming International Discus Championships (October 3-6 in Duisberg) which I mentioned in my column in April's **A&P**. We are looking into the possibility of arranging a trip if enough people are interested but we need to know soon so that prices, accommodation, etc., can be arranged. Please contact me on 01873 880658

After seven days I feed brine shrimp in small quantities many times a day until the fry leave the parents' sides when they basically prefer the shrimp to the parents' food. It is now time to remove the parents. I have always found this a better method than removing the fry. You can now begin to breathe a sigh of relief as you are nearly done with the intensive care.

Now is the time to begin feeding. In conjunction with the Brine Shrimp, small quantities of finely-ground good quality flake, Grindal worm and, most importantly, liquidised and frozen Beeheart should be fed on demand. Your fry should now be approaching one month old. The need for more space will very soon become apparent; in my hatchery an average hatch of fry (approximately 100) will need to be split into two 50 gallon tanks at six weeks old and into 4x50 gallon tanks at 10 weeks old. At 12 weeks old they will be showing future colour and shape and this is when the breeder should be selecting what could become future breeding stock. At 12 weeks old healthy Discus should be around 3-4cm in diameter.

Red based fish do not colour up as quickly as turquoise based fish, so if you are breeding Red fish do not be disappointed if no colour develops: it can take as much as six months for the colour to start showing.

## NEXT MONTH:

I WILL TELL YOU HOW TO GET THESE FISH TO 'SCHOOL AGE' WITH AS FEW PROBLEMS AS POSSIBLE





# COLDWATER JOTTINGS

BY  
STEPHEN J. SMITH



## Koi delight

I think I've found this year's "book of the year": it's the latest offering from TFH Publications, *The Completely Illustrated Guide to Koi for your Pond*, probably the most comprehensive book about Koi-keeping which I have ever seen. Now, don't switch off if you are not a Koi-keeper: this is a truly magnificent book which will enthral fishkeepers of all persuasions, and is remarkable value for money with authoritative yet easy-to-understand information supported by superb illustrations.

The book deals not only with Koi (there are the inevitable 'nose-down' photos of some magnificent Koi), it also incorporates information beneficial to pondkeepers in general, with chapters on ponds, filtration, plants, animals which live in the garden, and suitable fish for the pond. However, the 'cherry on the cake' is the inclusion of several papers on the more technical aspects of Koi: I was particularly intrigued by the paper entitled 'Arguments for the Roman origin of domestication' and wondered what on earth Romans had to do with a Japanese hobby! In the first century BC, freshwater fish initially destined for the table were reared in piscine (formerly saltwater reservoirs for the production of oysters) but eventually these were turned into lakes for rearing fish as pets, one of which is said to have belonged to "Antonia, the daughter of Drusus, (who) had such a pet which was adorned with golden earrings". You will have to buy the book to find out more!

So, whether you want to delve deeply into pond- or Koi-keeping, or simply want a beautiful book with hundreds of wonderful illustrations, then *The Completely Illustrated Guide to Koi for your Pond* will suit both requirements admirably. What more can be said?

*Editor's Note: Stephen's appreciation of the new Koi book has had to be slightly trimmed, as readers will find another review on the same book elsewhere in this issue but, such is the impact the book made on both reviewers that it was felt (for once) you couldn't have too much of a good thing!*



PHOTO: AMP LIBRARY

## 'New ponder'

One of several email correspondents to Coldwater Jottings, Marianne (I still don't know her second name) has responded to a mention of her in the March issue. Marianne lives in California, USA, and has recently added a biological filter to her pond, which accommodates a collection of Koi and Goldfish. And, following the limits I advised in these columns, she has been able to add to her collections, with an American Fantail, a Calico Fantail Ryukin, and two Calico Fantails, as well as a Pearlscale which, unfortunately, she tells me, "passed on to the 'rainbow pond'".

Speaking of her filter unit, she adds: "I was concerned about using a poly container that was meant for plants, in case it would add toxins to the water. However, it is now full of lava rock as filter media, and I

plan to build a multiple tray fountain, and one of those Japanese things that tips and spills."

"One of those Japanese things" is called an shishi-odishi, or deer scarer, if I am not mistaken, and is one of my favourite garden ornaments. Constructed of bamboo, they almost the nearest thing to 'perpetual motion' for me, although they do need a small water pump to operate.

Of some concern, though, is Marianne's closing paragraph: "I have lots of copper pipe left over from a plumbing job, and wonder whether I can use this in a sort of sculptural way on the fountain. Do you know if it will contribute anything harmful to the water?" Full marks for asking the question, Marianne. But, please, the use of copper in any pond — or even aquarium — which contains fish will produce devastating results, as copper, brass, and

bronze, are all highly poisonous to fish.

## Now you can have perfection

Who'd have thought that you could get a recipe book for perfection? But that's just what is available in the shape of *The Perfect Pond Recipe Book* by Peter J. May from TFH.

Publications (ISBN: 0-7938-0487-6, £4.95).

Despite its almost underwhelming price — which might cause wouldbe purchasers to think again — it really does provide a wealth of information about pond construction. The fact that it does so in such a visually stimulating yet simple way is the book's main strength and attraction; things look simple and easy, everyone can understand the theory and practice, so confidence is established right from the start. There's simply nothing to misunderstand.

As a picture can convey more information than text occupying the same space, it should not come as a surprise to learn that most of the book is pictorial; line drawings vividly bring each task to life and the step-by-step sequences are reinforced by uncluttered instructions and handy, well-timed tips. The book concentrates on the installation of ponds, streams and water features using pre-formed units and/or flexible liners with the basic construction being formed from easy-to-use(!) building blocks rather than more difficult to use concrete. Ponds may be of the normal 'in-ground' type or of raised style; there's even a section on designs chosen for economy and safety in mind. Following the constructional stages, there are full details about planting, stocking and how to choose a suitable pump for whatever application you've chosen to install.

Although it looks simple, the author takes time at the beginning to lay out the guidelines for pond siting, and gives estimates on the amounts of materials required

## Feedback

Your questions, opinions, and information are the lifeblood of your hobby. So, do drop us a line about your enjoyment of coldwater fishkeeping by writing to me at Coldwater Jottings, A&P, Caxton House, Wellesley Road, Ashford, Kent TN24 5ET. If you have e-mail, you can contact me direct at: [jottings@sjspr.demon.co.uk](mailto:jottings@sjspr.demon.co.uk) - or, you can even see recent months' Jottings on the Worldwide Web at: <http://www.demon.co.uk/sjspr/aopm.html> — looking forward to seeing you there!



for various tasks. The only thing he cannot do is to take out the necessary hard work — but he does advocate taking things in easy stages, getting some help and minding your back! Such is the enthusiasm likely to be generated by this simple guidebook you'll want to be out and digging without delay.

## Avoid pollution

Indeed, pollution is usually the major factor with the majority of fish deaths in any pond. And it takes only a simple attention to care and maintenance to avoid your pond water from becoming polluted. Even with the use of a filter to keep the pondwater sweet, gravel and planting medium can become black and evil-smelling, so it is advisable to keep a special check on all your planting. Likewise, leaves and other debris can accumulate in the bottom of the pond, and the results of this can sometimes be seen by the production of bubbles rising to the surface.

If possible, when constructing

a pond, it is a good idea to install some kind of bottom-drain, and Koi-keepers will be familiar with this as a means of drawing "heavier" water, containing fish mulm and other debris, from the bottom and away to waste. Many Koi-keepers, indeed filter this water — I prefer to get rid of it completely rather than to place any additional load placed upon the filter (What? Come on Stephen, use it on your house-plants or garden at least! — Ed.)

A further factor which causes pollution is providing too much food for the fish to eat. Excessive quantities of food placed into the pond will result in much of this food sinking to the bottom of the pond. This will inevitably rot and again, will cause serious problems for the health of your fish.

So, feed only as much food as your fish will eat in a five-or-ten-minute period. Far better to feed your fish regularly with small amounts of food, than to ladle out huge quantities of food which will only be wasted. And, after all, one of the most enjoyable aspects of fishkeeping is watching them feed. So, the golden rule is: feed them a little — and often.

## Contributor right, Editor wrong!

A very regrettable error crept into Alex Stephenson's article last month (*Through a Telescope*) which was totally due to the Editor thinking he knew better. In Alex's reference to the Butterfly-tail variety, the name 'Tosakin' was appended to the text. This was wrong, as the caudal structure of the fish Alex was writing about and the one the Editor thought he was writing about are quite different, as can be seen from the accompanying sketches.

We apologise to Alex for this error, to all those readers who may well have reformed their esteem of Alex as a result, to all those who may have rung him up to tell him so — and especially to Alex's fellow members of the Goldfish Society of Great Britain, who know that he would never have made such an elementary mistake.

*Butterfly-tail:* The tail is well spread horizontally and, when viewed from above, forms the shape of a Butterfly's wings.



*Tosakin (Peacock-tail):* Caudal fin joined along upper margin, lower caudal sweeps forward then back.



ILLUSTRATIONS COURTESY OF ALEX STEPHENSON AND FEDERATION OF BRITISH AQUATIC SOCIETIES



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# frogs & friends

By BOB and VAL DAVIES



## Heads or tails?

A number of snakes — when threatened, use their tail to distract the predator. In some cases the tail is blunt, bearing a resemblance to the head as in the Rubber Boa (*Charina bottae*). The snake coils up with the less vulnerable tail raised to take the brunt of the attack.

In certain lizards the tail can also resemble the head. Primarily used for fat storage it could possibly function in the same manner as the snake's tail. This deception can be effective — one of us (minus his spectacles) recently tried hand-feeding crickets to the tail end of a fat tailed gecko (*Hemiteconyx caudicinctus*)!



Fat-tail Gecko — very deceptive shape and markings.

PHOTO: BOB & VAL DAVIES

## Holiday souvenirs

Previous articles have advised against buying holiday souvenirs made from animal derivatives and against buying/collecting animals to bring home. North Africa is a popular destination and holidaymakers might well be offered live tortoises. The trade in live specimens is reported to be more common in Tunisia than in Morocco but in the latter country souvenirs such as bellows and banjo-like instruments made from the shell of the Mediterranean Spur-thighed tortoises (*Testudo graeca graeca*) are a familiar sight. From a practical point of view these items are not much use — other materials would make better instruments but many people are apparently taken in, no doubt thinking they are buying 'genuine native artefacts'. Since the tortoises are on CITES Appendix II it is illegal to bring home live tortoises or objects made from their shells.

Before the import of *T. g. graeca* was banned an

estimated several millions of them were taken from Morocco to supply the pet trade. This reduction in the wild population plus subsequent habitat destruction had caused this species to be class as 'vulnerable' (threatened with extinction) by the IUCN. An estimated 10,000 tortoises per year are used in this souvenir trade — females, being larger than males, are preferred. Since tortoises have slow growth and reproductive rates such destruction must be disastrous for the species. Unfortunately trading in tortoises is still legal within Morocco although their exportation

*Testudo g. graeca*, frequently offered for sale as hatchlings or used to make souvenirs for tourists in several popular North African holiday destinations.

PHOTO: BOB & VAL DAVIES

was (theoretically) banned in 1975.

## Native herps

In April of this year the Daily Telegraph contained a report on the finding of a black adder (*Viper berus*) during a survey in Dorset. Although melanism is known to occur in adders it is apparently very rare. The caption underneath the photograph was 'dark and deadly', which is rather misleading as a human death



from an adder bite occurs only once in ten years — compare that with deaths due to traffic or other accidents — we are at far more risk just crossing the road! However, it pays to treat adders with respect and leave well alone just in case you happen to be one of the relatively few people who are vulnerable to their bite.

## Wildlife trade

The exact value of the trade in wildlife is not known — one estimate is five billion US dollars per annum. Added to this is an illegal trade in animals and products the exact details of which are anyone's guess but which must be substantial. The trade in reptiles and amphibians alone is thought to run into hundreds of millions. There is concern that this trade must be having an impact on wild populations which are also being depleted by other factors. In addition to the lack of details on the total extent of trade, information on many species in the wild is sketchy.

Since the demand for animals, for whatever purposes, is not likely to reduce, scientists at the Herpetology Conference in Adelaide last year called for more information on the trade and its effects on various species. One suggested goal was 'sustainable harvesting' —



setting up schemes to supply the international demand but protecting wild populations — a mammoth and costly task. One example is that of the Spectacled caiman (Caiman crocodilus). In 1995 quotas for export of almost 19,000 live specimens and 8,000 skins were allowed (from four countries). It is possible that some of these were 'farmed' — most of the skins were 'from 1992-3 production'.

It is often argued that the pet trade is a relatively small part of the total — huge numbers of reptiles and amphibians are used for food, medicine and hides. It is difficult to understand why there is such a demand for animal skin products but there is one 'positive' (if one can call it that) aspect — the American alligator was almost hunted to

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extinction for hides, meat, pleasure and through fear. When numbers dwindled to some 100,000 they were placed on the endangered list in 1967. No longer endangered (wild numbers estimated at one million), 100,000 pa are raised on farms which provide hides, meat and are a tourist attraction. Whatever one's views on this at least farming,

## CLUBS

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A juvenile Spectacled Caiman now farmed to protect wild specimens.  
PHOTO: BOB & VAL DAVIES

it can be argued, protects the wild population.

## Outdoors

For our garden frogs breeding this year seemed fraught with difficulty. The first pair seen in amplexus was on 4 February when the temperature of the water was 3°C (38°F). The first spawning did not occur until 10 March, it was then interrupted by snow which froze on the pond surface — the upper parts of some spawn clumps were actually frozen. By 16 March spawning activity resumed in a water temperature of 2°C (36°F) and reached its peak by 20 March when the water had risen to 4°C (40°F). Some unattached males actually clasped fingers when the water temperature was being tested.

The weather continued cool until 12 April when the first hatching was observed.

Development remained slow due to cool conditions — the first really mild day was 21 April when the tadpoles became free-swimming. Rather oddly, one freshly laid clump of spawn was seen on 13 April.

The ectothermic nature of amphibians means that they can be adversely affected by the vagaries of the weather — too long a period of activity before spawning can deplete their reserves. Freezing can kill spawn — low temperatures and delayed development may render it prone to fungus attack. A period of hard frost in the breeding season could also cause the adults to die. Summer droughts reduce food supplies — newly metamorphosed young may succumb and adults may enter hibernation in an undernourished state. We suspect the latter reason for reduced numbers of adults in the pond this year — 75 per cent of last year's total.

## HERP FACT FILE — METAMORPHOSIS

Even after many years of breeding amphibians the transition from larva to adult is still a source of fascination and a cause for wonder. Most amphibian species lay eggs in water or in suitable moist surroundings on land to prevent desiccation. Certain species retain the eggs and development occurs in the mother's body, the larvae being nourished either by the egg yolk or by material produced by the mother.

To effect this transition the larvae must undergo morphological, physiological and behavioural changes — the time taken can vary. Some desert species need as little as eight days or so (before their temporary pool dries out), whilst some other species may overwinter as larvae metamorphosis occurring the following summer (some may take two years). The various changes are controlled by the action of hormones especially those produced in the pituitary and thyroid glands.

In the most familiar example, the common frog (*Rana temporaria*), metamorphosis takes some 16 weeks,

although some tadpoles will often overwinter. The eggs hatch, according to temperature in about five days. Development is roughly as follows:

Five days after fertilisation — embryo is ready for hatching — mouth and external gills only just developing.

One day after hatching — respiration is via the skin, remainder of yolk sac provides sustenance.

Two-three days after hatching — mouth open, external gills functional, starts to swim and feed by rasping plant material from various surfaces.

Six days after hatching — external gills start to wither, operculum (a fold of skin to cover the gills) starts to grow.

Three weeks after hatching — external gills have disappeared, respiration by internal gills.

Eight-ten weeks after hatching — hindlimbs have developed, forelimbs apparent as buds (bulges), lungs have formed — air is gulped at water surface. Diet becomes more carnivorous — the larval rasping teeth are shed.

Twelve weeks after hatching — front

limbs developed, tail starts to shorten and mouth starts to broaden. The eyes become more prominent.

Sixteen weeks (approx) after hatching — the young, air-breathing froglet leaves the water, the tail will have all but disappeared. It will soon feed on insects, invertebrates etc.

The metamorphosis of salamanders is less noticeable. The larvae resemble tiny adults but with feathery external gills and a tail 'fin', both of which will be reabsorbed. Unlike frog tadpoles salamander larvae are carnivorous, eating small organisms. The frog tadpole's gut is extremely long and coiled to cope with a herbivorous diet — this shortens during metamorphosis to prepare for insect fare on land. This reduction may be as much as 85% of the original length. The salamander larva undergoes some internal changes in skeleton and musculature, loses its lateral (sensory) line and undergoes changes in the permeability of the skin as well as changes to the eyelids.



## Tetra COMPETITION

# Feed a fish and save a whale!

In many parts of the world whales, dolphins and porpoises face severe threats from whaling, pollution, habitat destruction and through fisheries. As the largest charity in the world devoted solely to the protection and conservation of these creatures the Whale and Dolphin Conservation Society on its own can only achieve so much. However with the support of every concerned person, and the weight of public opinion behind them they could achieve so much more.

A brand new and exciting development is now under way, by linking with Tetra, the world leader in fish foods, WDCS is seeking to bring the "Save the Whale" message to the many thousands of Tetra's customers, thus helping to increase public awareness of the serious threats facing these magnificent creatures.

Unfortunately no organisation can achieve anything without the necessary resources and much of the campaigning and conservation work undertaken by WDCS is inevitably expensive. The £10,000 minimum contribution from Tetra's Save the Whale promotion will enable the Society to fund at least one additional project.

As Tony Pease, Corporate Liaison Officer of WDCS says: "By selective use of incentives, all cleverly related to whales, including not one but two opportunities to win a whale-watching holiday, I am sure that Tetra's Save the Whale promotion will not only catch the imagination of fish lovers throughout the UK, but will also result in an increased supporter base for WDCS and increased sales for Tetra."

Purchase of certain clearly-



marked products within the Tetra range will help raise money towards the 'Save the Whales' fund, the more that is bought, the bigger the donation. There is also the chance to win a fantastic £3,000 whale-watching holiday for two. Full details relating to the promotion are in the tubs.

One particular idea may well appeal to schools and groups. By sending in 30 foils from the promotional packs Tetra will adopt a whale on your behalf. If you send in two gold foils plus a cheque or postal order for £1.40 a soft cuddly toy whale (approximately 7in long) will be yours.

We have 12 cuddly whales to give away to readers of *Aquarist* and *Pondkeeper*. Simply write the answers to the following three questions on the back of a sealed-down envelope or a postcard, put on your own name and address and send to: Dept CT, Tetra Competition, PO Box 2162, Bournemouth BH2 5ZA, to arrive no later than Friday July 5th 1996. The first 12 correct entries to be drawn will each receive a cuddly 7in whale.

### QUESTIONS

1. The WDCS was formed in 1957, 1987 or 1995?
2. The Balji is one of the most endangered species in the world of Whale, Dolphin or Porpoise.
3. The minimum contribution Tetra will make to the WDCS is £3,000, £5,000 or £10,000.

## A fascinating **FISH FACT!** by LINDA LEWIS

### Which is the front end?

Butterflyfish come in so many different, beautiful patterns that it can be quite bewildering. The variations help members of the same species to recognise each other, but many patterns have another, just as vital, use. In several species of Butterflyfish, the eye is camouflaged by a dark bar or stripe, which runs right across it.

Predators normally attack the front end of their prey, as head first is the easiest way to swallow a fish. When the eye is disguised, it becomes more difficult to tell which is the front end. This situation can be made even more confusing if the fish has a false eye spot, near its tail. Should the Butterflyfish be attacked in this area it only risks losing part of its fins, not its head. To add to the predator's puzzlement, the Butterflyfish will then seem to make its escape backwards!

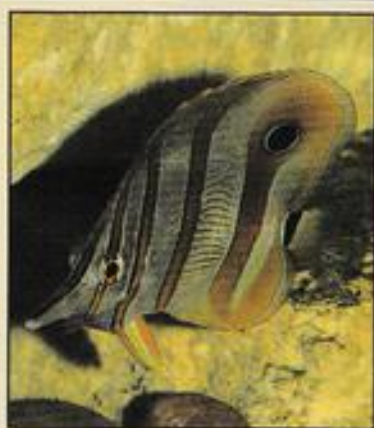


PHOTO: LINDA LEWIS



SUPPLEMENT



# AQUARIST & PONDKEEPER

PHOTO: M.P. & C. PIEDROH

PRACTICAL WATER GARDENING



**W**hilst the majority of our readers will be, by definition, 'aquarists' there is a growing band of 'pondkeepers' coming up fast if all the market research figures (and increasing number of water gardening outlets) are to be believed.

With all due respect, the physical side of pond installation is best not thought about; what is more important is the planning of the undertaking as a whole. In this Supplement we will be taking a basic look at the overall idea of putting in a pond with following sections dealing with separate developments once you've done all the hard work (sorry, I promised not to mention that!)

Brand new ponds can look a bit obvious so we tell you how to make it



PHOTO: KEITH LAMBERT

look less 'man-made' and also more secure. Coping with green water problems is always an early problem with new

pondkeepers and it's a subject with many remedies offered; here we tackle it indirectly with a collection of

floating plants and more directly with ultra-violet light. That the pond can change its appearance from season to season goes without saying, but it can also change its look depending on how it is lit, whether by daylight (choice of siting is important here) or by artificial light, long after the sun has set.

If you've got children around the place and are naturally concerned about their safety with any close proximity of very tempting water, then our feature on child-proof water features should set your mind at rest (they're also ideal for the smallest garden or roof-top patio).

Perhaps you can't be bothering with all this planning and discussions about equipment and livestock — well, we've got just the thing for you too... a pond with no fish!

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# LET'S BUILD A POND?



You can get many ideas for your pond design from professional gardens such as 'Pureland' (above) at North Clifton, Nottinghamshire.

**H**ow often does a husband ask his wife that question whilst looking out over the garden on a sunny afternoon? And how often does his wife's heart sink, as she thinks "Oh dear, here comes another eyesore project that won't get finished?"

It doesn't have to be like that however, as by following a few simple ground rules, you can create quite a presentable pond,

---

**BARRY GOODWIN**  
INVESTIGATES BRINGING  
WATER-GARDENING DREAMS INTO  
REALITY WITHOUT TEARS.

---

● PHOTOGRAPHS BY THE AUTHOR ●

that requires perhaps 1/4 to one hour of your time per week in the summer, and hardly any time at all in the winter to look after.

## EARLY DECISIONS

Your first decision must be what sort of fish you wish to keep, and this will decide for you how big your pond should be, and also how complicated (not to say expensive) its equipment







## PRACTICAL WATER GARDENING

### Let's Build a Pond?

certain extent, removing debris, which will necessitate regular cleaning of the sponges.

#### KEEPING THINGS RUNNING

Once established, a biological filter should never be switched off, summer or winter, but waterfalls should be bypassed, and fountains shut down, during winter to prevent excess cooling of the water taking place.

Keep a small area clear of ice, either by providing a small floating heater that can be purchased especially for this purpose, or by pouring a kettle of boiling water over the ice in one spot and melting it. This latter method is however seldom practical. Never break the ice with a hammer, or similar, as the shock waves generated could damage or even kill your fish.

Your pump can be situated in the pond, on a small plinth about 6in off the bottom to prevent it picking up the dirt that will inevitably accumulate there. If this dirt is drawn in by the pump, the impeller will liquidise it and keep it in suspension, which means you will always have cloudy water. The pump will



Filters are also now being made, such as the one above, that resemble patio tubs.

draw pond water and push it to the filter, and by cunning design all the pipework and filter box can be well hidden, but best of all — your nearest and dearest will now be looking upon the project with less scorn at this point and may actually become interested in its final outcome. When situating your pump, position it at the opposite end of the pond to that in which the water is returned from the filter. This will ensure

a good flow and exchange of water throughout your pond, but it may be a good idea to plant Water-lilies out of the main circulating water currents. Your waterfall will provide good oxygenation for your pond, and there are pumps available that will give a fountain display as well, which also aids good oxygenation.

#### PLANTING

You can plant your pond with all manner of water plants, and the design of the pond can be so that there is a marginal shelf to support the trays that such plants

come in. You can have underwater plants as well, but please be careful that you do not have too many of these.

You will hear people referring to underwater plants as 'oxygenating' plants, but beware, as what they contribute to the oxygen level during the day, they take back at night, and the resultant carbon dioxide produced could turn your nice pond into a death trap for your fish, causing them to suffocate.

Be careful where you buy your plants, as it is possible to bring all manner of fish parasites in with them, especially leeches, and if you should be unfortunate enough to encounter these, you will realise that eliminating them means almost starting again!

#### 'POPULAR' PROBLEMS

There are two things that you may be troubled with, especially during the first couple of years, and these are green water, and Blanket-weed.

Green water, which is caused by the growth of single celled algae in the water, is quite simple to combat as there are algicides on the market to aid you here, although I am not in favour of chemical methods.

Blanketweed, as seen here, can be a curse to a pond and every effort should be made to control it.





The installation of an ultra-violet steriliser will be very effective here as it eliminates the algae by other means without adding chemicals to the water.

Your pond will need about 10 watts of U.V. for every thousand gallons of water. The U.V. radiation causes the algae particles to flocculate and settle out,

where they can be siphoned away. A U.V. steriliser should be placed in the pump line from the pond to the filter, or in the return line to the pond if you have a



The garden pond can be small, as seen above, or very large, as shown below. It can be seen that both are very attractive additions to the garden surroundings.





## PRACTICAL WATER GARDENING

### *Let's Build a Pond?*

different type of filter known as a 'gravity fed' system. This type of filter, almost a 'necessity' in a Koi pond, is another of the differences in design that I hinted at earlier which are applicable to keeping Koi.

Blanket weed is another story however, as this, whilst still being algae, is a different type which forms itself into filaments, and can be a cause of pump lines and filters becoming blocked; it can be dealt with in several ways.

(a) The chemical solution, which I have already said that I am not in favour of, whereby an algicide is used in the pond water. The main problem with this method is that it will probably get rid of your plants as well. I have also found that it loses effectiveness after a period, and the dose has to be increased until eventually it must be approaching that level where your fish will be adversely affected.

(b) The plant solution, whereby sufficient marginal plants are provided to remove much of the nitrate content from the water. Note, I specify marginals here, and not underwater plants.

(c) The magnetic solution, where magnets are used on the water return lines to the pond. The magnetic flux thus generated then prevents the filaments of algae forming. This is successful only for some pondkeepers however.

### MINIMAL MAINTENANCE CHORES

Such a pond as I have described will require minimum regular maintenance. It will need an occasional siphon out of silt from the bottom; it will need the pump intake strainer cleaning as necessary, possibly daily during the summer, and it will need the filter sponges cleaning about once per week. Do not neglect this necessary maintenance.

When cleaning filter and pump intake sponges however, do not use tap water, as the chlorine will destroy the bacteria in them — use a bowl of pond water, and squeeze them out gently to remove the worst of the muck. Do not get them

'squeaky clean, and you will find that they work much better.

It will be an idea when carrying out maintenance to also occasionally change a certain amount of water, say 10% per week, as this will keep up the mineral content in the water, and keep diluting nitrates and phosphates that succour the blanket weed.

### A HAPPY ENDING

By spending about 1/2 to one hour a week on your pond in this manner, you will not only avoid a big 'annual clean out' which will mean your pond starting off from scratch again, but you will make your pond a more delightful addition to your garden, and obviate any personal stress that is otherwise caused by leaving tasks until they all get out of hand.

Better than that, it will keep your pond looking clean and nice, your fish healthy and growing, and you will have a wife who smiles at you every time she looks out of the window. What better note to finish on than that?

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# LIGHTING THE



**L**ighting, is an effective way of drawing attention to water features. The amount of light reaching and reflected from the water by daylight will be affected by the situation and surrounds. A pool sited near other features such as walls, outbuildings or plants will look very different from one in an open site.

It is at night however that the combination of water and light can be used to greatest effect. Lighting water features brings a whole new aspect to them and extends the use of the garden area. Fountains and cascades take on new lives if lit by night and ornaments and features will stand out. Underwater lights give a warm or eerie glow to the pond depending on the levels

**SUSAN STEPHENSON  
FINDS THE POND CAN CHANGE ITS  
MOOD DEPENDING ON THE  
PREVAILING ILLUMINATION.**

and create mesmerising pools of colour. Light shone at waterfalls turn them into glittering reflections and hidden spotlights can pick out details on fountains or sculptures. Strong jets are effective used with lights as the foaming water gives scattered light effects. Lights placed below cascades

transforms them into shimmering ribbons of light.

Lighting can be used to light bridges, stepping stones or steps to ensure safety in the dark hours. Equally, poor lighting can turn the pool area into a hazard by night. Lighting also offers extra security by illuminating the garden.

Garden candles and flares are cheap and some discourage insects. They are an effective way to provide summer lighting. They will need regular replacing as they burn down. Chinese Lanterns and bamboo flares with refillable reservoirs are available and these can be novelties for summer use.

For permanent and more sophisticated lighting electric bulbs provide the best available



# POND



PHOTO: SIBIAN STEPHENSON

systems. Lighting can be from above the water or below it. Floodlights can be attached to buildings, hidden in trees, bushes or spiked into the ground among plants. However care should be taken that the reflections do not dazzle as the desired effect may be ruined. Unless the light unit itself is attractive they are best not visible during the day. This can be done by placing them behind rocks, plants or shrubs so that the feature does not interfere with the beam of light.

The use of lighting, such as these low-wattage Pond Lights, can transform the pond after dark. They can be used separately or attached to the vertical outlet of a pond pump.

PHOTO: COURTESY OF HOZZLOCK

Pool lighting should be kept low-key so interesting shadows are not lost, whilst being enough to ensure safety. One way to achieve this is by using a series of down-lighters that stand 45-60cm high and can be used to create pools of light along paths. (One non-electric alternative is to use 'glo-sticks' that absorb energy during the day and give off a glow at night.) Lights of similar intensity should be placed at regular intervals, directing the light to avoid glare. These downlighters may also be hidden under bridges, illuminating water, plants and fish.

Uplighters can be shone into the trees to give a green light. The moving leaves will create changing patterns which will be reflected with great effect on the water.

In-pool lighting can be used in many ways. Light can be directed across the water to give a diffuse glow or in shallow ponds or swimming pools with clear water and pale coloured bases lights directed at the base will be reflected.

Submerged lights directed at fountains give bright jet streams contrasting sharply against their background which could be darkness or a different colour light.

Different coloured filters can be used to create shades and hues. Coloured bulbs can give stronger colours but care should be taken that they do not look gaudy. Design and choice of lighting should go with the rest of the garden. Lighting is costly and should be carefully thought out before going ahead. For security purposes, some lights can be linked to infra-red detectors which switch on with movement.

For general lighting the cheapest units are standard household tungsten bulbs preferably in a rainproof bulkhead. This type of lighting is non-directional and can normally use only lower wattage bulbs. These are ideal for illuminating patios and areas near the house where units can be fixed to walls. They cast a warm yellow glow but tend to run quite





## PRACTICAL WATER GARDENING

### *Lighting the Pond*



These low-voltage Shaded Lights have a snap-connect system which makes them quick and easy to install. They can be used to highlight paths and borders.

PHOTO: COURTESY OF HAZELLOCK

hot which limits the maximum size of the units.

Halogen (tungsten-halogen) bulbs are becoming more popular. They are reasonably compact but have a bright clear-white output. Though more expensive they give out more light so less units may be needed than equivalently rated tungsten bulbs. They have a fairly long life and types are available for use with low-wattage equipment.

Mercury-vapour bulbs give a bright-bluish white light that shows colour quite well but can be a little harsh.

Sodium lights give a warm amber-orange light. They are cheap to run, efficient and ideal for lighting large areas and floodlighting buildings.

Metal halide bulbs give an intense white light similar to daylight and although they are also useful for floodlighting large areas they are more expensive to run than either mercury-vapour or sodium bulbs. Mercury-vapour, sodium and metal halide bulbs all take a few minutes after switching on to reach full intensity which can be a slight disadvantage. All require elaborate

starting gear.

More specialised lighting units incorporate bulbs with built-in reflectors. These are named PAR 38 bulbs in some countries. They are tungsten bulbs with thickened front glass that will not shatter if rain falls on it when hot. Other floodlighting units use a reflector situated inside the rainproof casing, the light output depending upon the kind of bulbs used.

When purchasing lights be sure to ascertain if it is a spot or flood light. All parabolic reflectors are designed to give a particular spread of light eg 10-20 degrees or 40-50 degrees. This latter would be a narrow floodlight while 80 degrees would be a general floodlight. Spotlights are best suited to lighting specific features while floodlights are more generally useful.

Both mains and low-voltage forms of lights are available and mains voltage ones are usually more powerful (usually 80-150 watts). All electrical connectors must be sealed against water penetration and these types of unit tend to be fairly sturdy and use heavy-duty cable. All cable-runs from the units to

supply should be well protected.

Water penetration is likely to be less of a problem with low-voltage units (12-24v) but these tend to be less sturdy and fitted with a light two-cored cable. Low voltage cables may be disconnected and reconnected easily and so the lighting becomes more adaptable and portable. There is no need either to be quite so 'protective' towards low-voltage cables which, by definition, do not carry such lethal voltages.

Low wattage lights tend to be car lights lamps (20-25 watts) or halogen spots (expensive). The car lamps have a wide angle, limited light output and really are best used for small features. Higher powered low-wattage bulbs are available but they require the use of expensive transformers. The low voltage halogen types are a good compromise between these and the mains voltage lights and usually have a power output between the two.

All low-voltage lighting requires a transformer to step down the voltage between the mains and the lights, which must be positioned safely in a dry, ventilated position. Transformers have



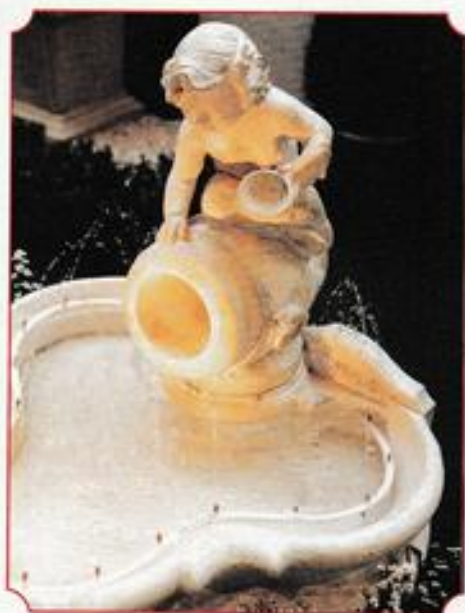
## PRACTICAL WATER GARDENING

### Lighting the Pond

limit to the number of units they can power so you may need more than one if several lighting features are to be used. Also, the longer the cable on a low-voltage unit, the weaker the light output although some can be extended up to 100 metres without deterioration in voltage levels.

Submersible lighting units are available in both mains and low-voltage forms. The higher voltage types are usually sturdier and more able to withstand contraction and expansion due to heat while staying waterproof. Some types need to be submerged beyond a minimum level to avoid overheating while other types can be used above or below the water. Coloured filters and lenses, can be fitted. All lenses and filters will need cleaning to remove accumulated algae and dirt.

Elaborate features are



Dramatic lighting can add to the effect of special features in the garden. PHOTO: AGF LIBRARY

available for use with fountains. These come with electronic programs which switch different jets off and on and vary the levels of illumination but these are only for ardent light fans. Make sure the control units are easily repaired as they are very expensive to replace.

Whatever your choice from simple small lights to elaborate systems using a mixture of different lighting features all electrical wiring must be fitted and tested by a trained electrician and the use of personal protectors (circuit breakers) is recommended for all wiring near the pool. The mix of water and electricity can be lethal especially when the human factor is added.

With safety in mind and careful planning your pool can be subtly lit to bring a wonderful display to the garden both day and night, all year round.

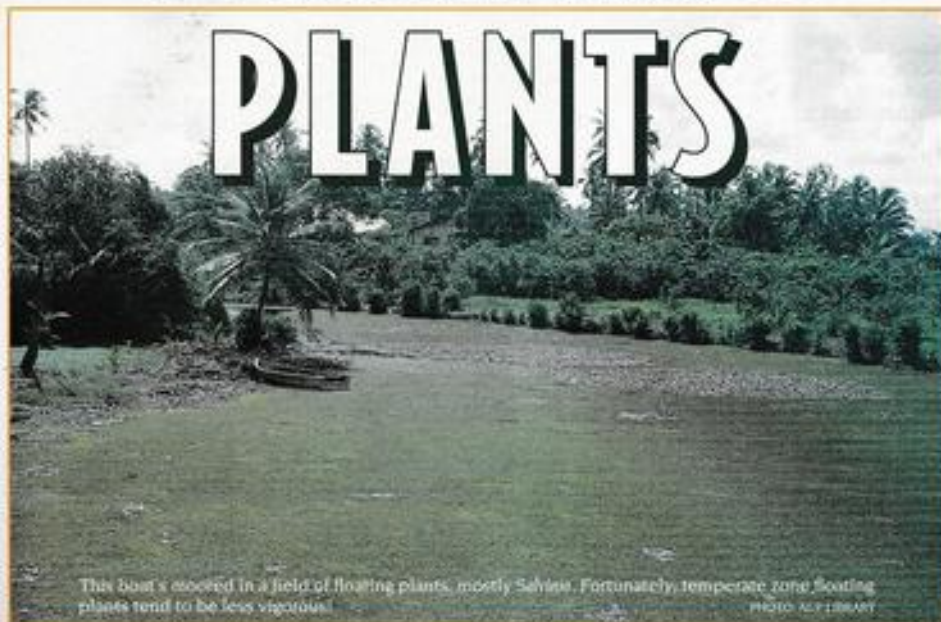


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# FLOATING PLANTS



This boat is moored in a field of floating plants, mostly *Salvinia*. Fortunately, temperate zone floating plants tend to be less vigorous! PHOTO: ALP LIBRARY

**F**loating plants play a very definite part in the wellbeing of every pond, which has sufficient light to maintain them. They not only form an attractive finishing touch but by filtering the light act as an inhibitor to the growth of algae. They also act as efficient filters mopping up surplus minerals which are detrimental to the animal life of the pond.

Floating plants, especially those with long trailing rootstocks, also act as a repository for fish spawn, and as a place of shelter for the fry.

A number of very attractive species are native to the British Isles, these being supplemented by sub-tropical and tropical species which are treated as annuals where winter frosts are prevalent.

When introducing floating plants to the pool care must be taken to place them on the surface the right way up. If not the plants will waste a great deal of energy righting themselves.

## BARRY JAMES LOOKS AT SOME TOP PLANTS – LITERALLY!

The mechanisms by which the plants maintain themselves on the surface have long fascinated botanists. Some species have sponge-like tissue in the stems and leaves which contain gas, rather like foam rubber. Others trap air in close-knit fibres which cover the surface.

Most species propagate themselves by runners, other by simple division or by producing offsets. *Trapa natans* is the only one regularly increased by seed. These peculiar seeds, shaped like the horns of oxen, are edible and go by the name of Chinese Water Chestnuts.

When conditions are favourable growth of floating

plants can be extremely rapid, the whole surface of pools, lakes or even slow-flowing rivers can become completely covered by a mat of vegetation. This often happens when new habitats are created. The most famous example occurred when the Zambesi Dam was constructed. Within months the lake created behind the dam was covered in a growth of *Salvinia* and *Eichhornia*. These plants by their sheer bulk impeded the movement of row boats and their roots jammed the propellers of the outboard engines of motor boats. Luckily in our climate this seldom occurs!

However, some very fine-leaved floating plants (such as some species of *Lemna* — Duckweeds) should never be introduced to small garden pools, especially if they do not contain any fish which might otherwise keep their growth in check. Incidentally, floating plants should be added to the pool at the rate of one portion (or plant) per 15 square feet)



# PRACTICAL WATER GARDENING

## Floating Plants

### VARIETIES OF FLOATING AQUATICS

#### *Azolla caroliniana*, Fairy Moss

These tiny plants are in fact related to Ferns. They form a bright-green mossy floating carpet. The individual fronds reach a length of 1/2in. In Autumn the plants turn bright-red and remain this colour until new growth starts again in Spring. Most individuals perish in the frosts of winter but normally enough survive to re-populate the pool in the spring. Because the plants form into mats they are easily removed if they become overgrown.

#### *Eichhornia crassipes*, Water Hyacinth



The showiest of all floating plants, the shiny rich-green foliage grows in perfect rosettes. The leaves are smooth and cordate with the leaf petioles being modified to an extraordinary degree. They are inflated and contain spongy tissue known as aerenchyma which renders the plant extremely buoyant. The showy flowers are a delicate shade of violet with a conspicuous blue peacock-eye marking on the upper petals. *Eichhornia* seldom blooms outside in the British Isles except in exceptional summers. In the conservatory however, with the increased heat, flowers are often produced. The long purplish roots hang down into the water reaching a length of a foot or more. Professional Goldfish breeders often use them to trap the eggs. Water Hyacinths are imported from Singapore every year. Old plants seldom survive the winter even under glass.

#### *Hydrocharis morsus-ranae*, Frogbit

This charming little aquatic is becoming increasingly rare in the wetland habits which are its home. The bright-green rounded leaves are pale-green underneath and filled with spongy tissue as with the previous species. The long petioles arise from a squat stem which also supports long dangling roots. The small dainty three-petalled flowers are white and born in early summer. Frogbit spreads quickly over the surface by runners. It is however a favourite diet of *Lymnaea* Snails which will quickly decimate this plant. You will seldom find this plant

popular plant if it wasn't so difficult to obtain. Native to the British Isles it is only common in southern counties. *Riccia* forms emerald-green masses of foliage which float just below the pool surface. Individual plants resemble small closely woven baskets. A very useful plant which affords perfect protection to fry.



in your garden centre, and may have to obtain it from specialist nurseries.

#### *Lemna triscula*, Ivy-Leaved Duckweed

As the saying goes 'do not be lobbied off with substitutes.' All

other Duckweeds spell trouble in the garden pond. This pretty little plant floats not on but just below the surface where it forms loose clumps of pale-green three-pointed leaves. It really helps to keep pond water free of the algae which causes green water.

#### *Riccia fluitans*, Crystalwort

This would be a very



#### *Stratiotes aloides*, Water Soldier

A most unlikely looking plant for an aquatic. Each individual closely resembles the head of a Yucca plant. The stiff rosettes have wicked spikes along the edge. The colour varies according to season. Young plants are pale-green but darken with age. Flowers are white, uninteresting and short-lived. Water Soldiers float half submerged on the surface in summer, but sink to the bottom of the pool in winter.



#### *Trapa natans*, Water Chestnut

Trapas are annuals with a creeping, floating stems and triangular dark-green foliage. They are made buoyant by the long, swollen petioles, which add to the attractiveness of the plant by their rosy-pink colouration. *Trapa natans* is almost extinct in its European habitat and has been entirely replaced by *Trapa ficornis* from China. The plant is propagated by seed but in the UK is imported annually from Singapore where it is extensively grown for both the aquatic and restaurant trades.



# SAFE, SMALL AND SMART WATER FEATURES FOR THE SMALLER GARDEN

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• GRAPHICS BY THE AUTHOR •

## PRACTICAL POINTS

The basic form of a self-contained water-feature is a sump which contains the pump and reservoir of water, a pipe that leads from the pump to the jet, spray, or fountain head, a water display to show off the flow of water and a tray to contain the splash and water movement and the return to the sump.

## KEEP THE SUMP CLEAR

In addition, a grille or screen should be used to contain gravel, cobbles or pebbles but allowing the water to run freely into the sump area.

A power line is needed to drive the pump, this can be either off the mains or reduced, through a transformer, to a low voltage to make a safer use of electricity.

These units can be fixed above or below the ground and, within reason, take on any shape or form that suits you and your garden.

The sump should be watertight, it can be ready-made from plastic, glass-fibre or other impervious material or you can build it yourself using concrete. Before starting, work out how deep the sump will need to be, it will have to contain the pump with its various pipes and flow controls. A 75mm (3in) slab of concrete will need to be laid larger than the sump and a suitable mould such as a plastic washing up bowl of the required diameter and depth placed in position, surrounded with a mould to make at least 50mm (2in) of concrete wall to the sump.

If a concrete tray is needed this is formed at the upper lip of the sump and should have a rim around the outer edge to contain both the water and the stones. The whole of the concrete structure should be finished with a suitable pond paint to isolate the cement from the water and seal any small leaks. Do follow the manufacturer's instructions for a trouble-free finish.

## PUMPS

There is a wide range of pumps available with a wide range of prices, generally speaking the cheaper the pump, the shorter its life. They come in a variety of sizes, some quite miniscule designed for the purpose of powering a small feature with a tiny sump, while others are just pond pumps that are small, but are quite tall in size.

To power the pump an electrical cable will need to be run through the system and linked to a power supply. It is recommended that all mains electrical systems in the garden are protected with a Residual Current Device (RCD) which immediately cuts off the current if the cable is cut or the appliance shorts.

Low voltage cables are normally quite safe and do not need to be protected against shock but the cable at the mains side of the transformer should

► Continued on page 70



# Safe, small and snazzy for the smaller garden



A stone figure with an urn pouring water onto a bed of slate piddlestones, the water drains into a sump for recycling. The whole is set into a hexagonal-shaped curb which is placed in hexagonal slabs.



This flat-bed fountain has a non-slip slab drilled to take a bubble fountain and sited in a patio area. The water runs across the paving surface and drains into a sump set below the slab to be pumped up again.



▲ A large concrete drain pipe has a bell fountain fitted into a bed of cobbles which are laid over a reservoir that contains the pump which circulates the water. The pipe is placed in a bed of stones laid in paving.

▲ Above right A free-standing wall feature using rough-hewn timber, the water falls from an outlet into a shallow saucer which overflows into a second container filled with cobbles for recycling.

◀ Set into grass this circular brick feature has a central rock drilled to take a foaming fountain, the water drains over the rock into a gully bounded with tiles set on edge to cover the sump and pump.

A simple plastic, stone or concrete basin is set on a pedestal with a small fountain which sprays water onto a bed of gravel laid on a fine screen to allow the water to return to the pump below. ▶





# Smart water features

Many gardeners want to have a water feature but hesitate building on an extra pond, fit additional plumbing and filter systems then plant up a spectacular array of flowers and foliage just to hear the splash of water and enjoy the sun sparkling on the droplets.

A self contained water feature could be the answer, an independent display that just needs to be primed with water, then plugged into an available power point and switched on for an instant show.

These designs are safe for children to play with, for them to splash and touch the water without any hazard. By using a pre-cast rigid liner, the base could be covered with stones, these allow the water to drain through into the sump

which also holds the pump. At a later stage, when the children have become aware of the dangers of water, the stones can be removed and the full glory of the water can be revealed.

Choose a design that will fit into the scale and character of your garden, a square pond will look decidedly out of place in a wild garden, just as a natural pond will look wrong in a formal layout, also you will need to blend in materials with existing bricks and stones.

You can have features attached to walls, free-standing, in-ground or raised up, you can have jets, foaming fountains, sprays, bubble or bell fountains to give variety to the water flow, all it needs is a little imagination.



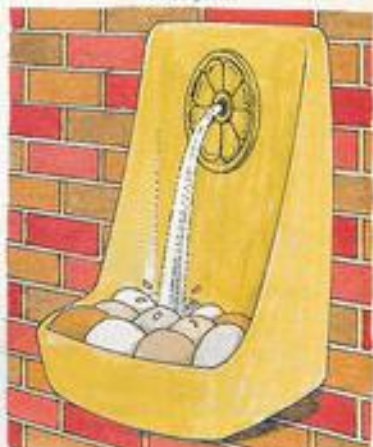
Small open ponds can be made childproof with an iron grille made to cover the surface. Gaps should be less than 100mm to stop a child's head from squeezing through. This is ideal for a raised pond.



A raised circular pond can be clad in timber and filled with large rounded boulders set over a sump to hold the pump to drive the foaming fountain. The water drains back into the sump for recycling.



Opposing fountain jets form a splashing spectacle, fixed in timber posts with a slate slab back, the water drops into a shallow timber basin lined with butyl rubber to be recycled through the jets.

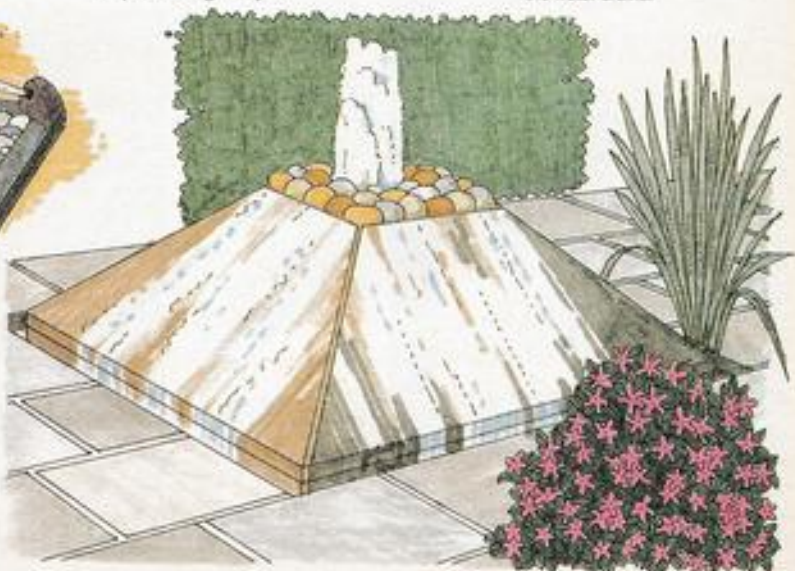


A wall fountain constructed from concrete, reconstituted stone or glass-fibre with the basin filled with pebbles to make plenty of splash. The pump is hidden under the stones where the water drains.

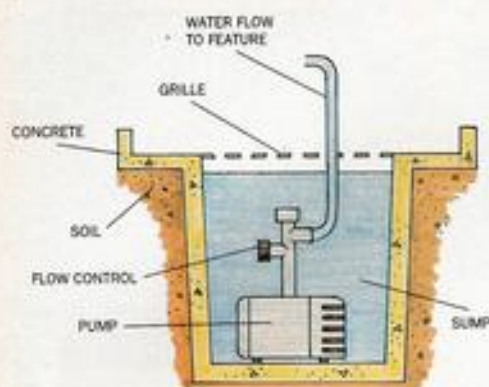


▲ This square feature has a fountain jet placed at each corner to splash onto a central stone, the water drains into the pebble base to be pumped through the system again. The whole is set in gravel.

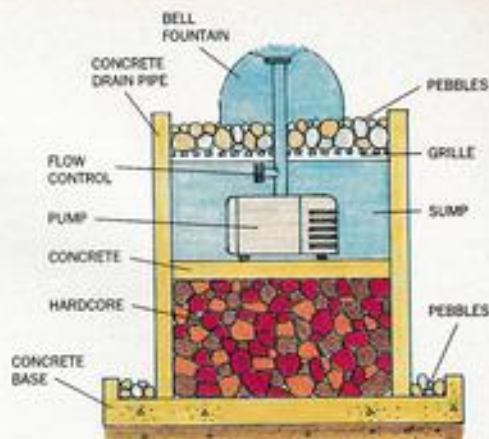
A pyramid of rough paving is topped with cobbles, the foaming fountain flows through the cobbles and overflows onto the slabs down into a gully to be recycled. The feature is sited in a paved patio area.



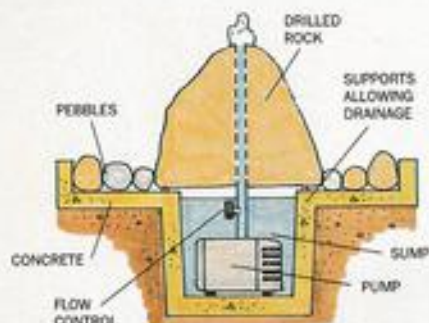




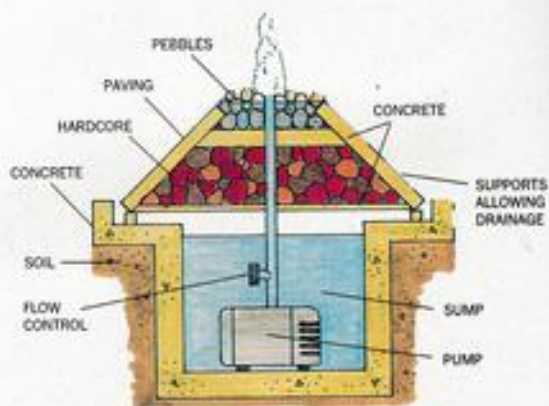
Cross section of sump showing pipe leading to water feature and grille to contain pebbles, cobbles or stones.



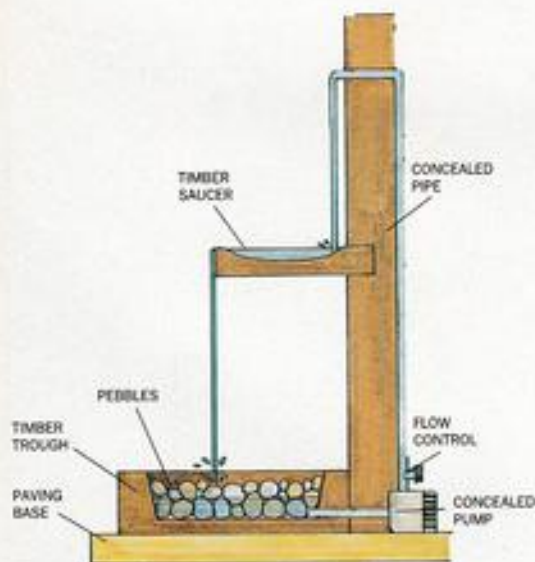
A raised bed using a concrete pipe holding a pump which powers the bell fountain, that drains back into the sump.



Cross section of feature with drilled rock surrounded with large pebbles set above sump containing the pump.



Cross section of the pyramid of paving and foaming fountain, the water flowing over the surface back into the sump.



This timber feature has a concealed pump and pipe to supply the water falling into the saucer and then the trough.

## CARE IN USE

One problem that often occurs is green water. This is quite normal and is caused by the action of sunlight on various nutrients in water. The ultra-violet light stimulates the growth of tiny organisms that turn the water green. This is not dangerous (just unsightly) and can be treated. The use of swimming pool chlorine, household bleach (this is not suitable for wildlife) or a proprietary chemical such as Interpet's Green Away will eradicate the algae growth but unless the chemical level is maintained it will return when the sun shines.

Dust can be another problem if you happen to live in a dusty area and will need the occasional cleaning of any sponge filter on the pump.

Damage to the pump and container with freezing during the winter can be avoided by draining down the feature and removing the pump. To avoid your display filling up with rain and snow it is important to cover it and protect it against the elements until the danger of frost has passed.



◀ Continued from page 65

be fitted with an RCD.

Mains cables used out of doors should be armoured or protected in a steel conduit to prevent accidental damage. Cables should be buried at least 450mm (18in) deep to stop them being cut through with a spade. Wall fixings should be secure and the wire well supported, as should overhead cables.

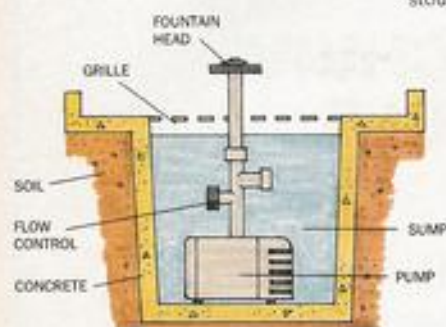
## TAKING THE WEIGHT

The weight of these water features, especially if built of stone, brick or concrete, should be well supported on strong foundations to stop any subsidence, never build on soft soil, it is far better to remove loose soil until solid earth is reached. A 100mm (4in) layer of hardcore topped with 100mm of concrete will be sufficient for most uses but if in doubt consult an engineer or builder for confirmation. Water features should be attached firmly to brick and stone walls: make sure that the wall is stoutly built and will hold the display

safely. Use wall plugs and rustproof screws to hold the feature securely, if in doubt use a small bracket under it to give extra support.

## WATER CONTROL

Some pumps are supplied with various pipes and fountain heads that are attached to the top of the pump, on one of the pipes there should be a control valve to adjust the flow through the pipe. This will need to be adjusted if the water flows too fiercely through your feature, it normally is quite simple to screw the valve up and this will slow the water flow.



Cross section of sump set below water feature with fountain display and showing grille to stop stones falling into water.



Diagram showing a cross section of a flat fountain using a drilled paving slab placed over the sump holding the pump.

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# WHERE HAVE ALL THE FISHES GONE?

**SUSAN BREWER**  
IMAGINES THE UNTHINKABLE,  
AND SUGGESTS SOME  
PRECAUTIONS.

• PHOTOGRAPHS BY THE AUTHOR •

**I**t's every pond owner's nightmare. You wake one morning, grab your tub of 'specially-enriched-extra-colour-super-nourishment-food-for-fish', saunter down the garden path, sprinkle the food into the pond — and lo and behold, no fish come churning up to the surface. They have mysteriously disappeared. Then you spot the bloated heron hardly able to raise his undercarriage, your neighbour's fat cat grinning smugly or perhaps a strutting portly magpie with the tail of your favourite goldfish protruding from his beak. So, what can you do to prevent it happening again? Well, Mother Nature bestowed birds and animals with great cunning, always ready to take



PRACTICAL WATER GARDENING



## PRACTICAL WATER GARDENING

### *Where Have All The Fishes Gone?*



a chance if they think they can get away with an easy free meal — so we fishkeepers have to be even more cunning and outwit them.

Heron are probably the worst pond predators. They are big and greedy, as anyone knows who has seen one of these birds, beak pointed skywards, neck bulging as a prized Koi slips easily down their gullet. Once they discover that your pond is an easy source of fish, they will keep returning until they have caught every one, right to the smallest tiddler.

However, usually herons are shy birds and tend to visit garden ponds only in the early morning or at dusk when there is less risk of meeting an irate human.

Electronic protector wires, seen above and below, encircle a pond.

Provided that your heron visitor is one of these shy types, you might find that putting a wire-mesh grid or net across your pond in the early evening and removing it after breakfast is all that is





## PRACTICAL WATER GARDENING

### Where Have All The Fishes Gone?

needed to deter it.

The main drawback with netting is that tall plants such as rushes or irises tend to grow through the mesh and so you have to consider your planting scheme carefully. Black thread attached to skewers impaled in the ground and criss-crossed over the pond works in a similar way, but can be routed around the plants.

Another idea is to install heat/movement sensitive floodlights, mounted on the wall or on a post near the pond. These should scare off most early morning and late evening predators. You can also buy these lights with a 'beeper' which will sound if they sense a bird near the pond; unfortunately, they might make you extremely unpopular with the neighbours if a passing cat, hedgehog or rat happens to be sensed by the photocell. The floodlights above my own pond seem to be ultra-sensitive, and I've seen them set off by frogs, bats and even large moths. Luckily for my neighbours, my lamps don't beep!

But what if your heron is an outgoing, life-and-soul-of-the-party type, who enjoys being floodlit while eating supper? Well then you need to try other measures. Herons don't like to feel insecure, so loose stones around the edge of the pond might well stop them from gaining a foothold. Thread stretched between canes all around the edge is another idea. They won't like the feel of cotton on their legs or wings, and if your pond is planned so that plants grow thickly around the

edge, herons won't easily be able to stand in the shallows. You'll probably soon find they'll give up on your pond and fly off to easier pickings elsewhere.

Some people swear by installing a plastic heron, the idea being that herons are solitary birds and won't invade another's territory. Beware! Make sure your plastic decoy isn't too glamorous or handsome — you might attract a whole amorous breeding crowd. Recently a gentleman stuck feathers all over his plastic heron to make it more realistic — and to his amazement, it was attacked and eaten by a fox!

I phoned a dealer of so-called 'heron scarers' recently, and asked, which, in

his opinion, was the best. He replied that the only sure way of frightening herons was to use a 12 bore shotgun, 'but unfortunately the Department of the Environment strongly disapproves.' I hope that he was joking.

Bamboo bird scarers are worth considering. These can be purchased in garden centres and consist of two pieces of bamboo, hinged together. The longest piece is pushed into the ground and a constant trickle of water is needed to power the apparatus. The shorter bamboo piece gradually fills until it dips and empties, then shoots back into place, knocking against the main section with a satisfying clonk. The trouble is that although these gadgets might scare off herons and magpies, they will also alarm the inoffensive blue tits, robins

and dunnocks who come to bathe.

It's possible to buy life sized 'pretend' cats made from shiny metal with gleaming eyes, the idea being that they scare off birds — but whether they'd frighten a heron is debatable. Once again, they could frighten off the smaller birds which most people welcome in their garden. On the other hand, birds aren't so stupid as we think — I have an ornamental owl in my garden, which is in constant demand as a lookout post for sparrows. They squabble for the privilege of being 'top bird', the one that stands on the owl's head! I've never noticed a bird frightened or intimidated by its staring yellow eyes.

Cats can be a pest near ponds, though, in their defence, many seem to enjoy watching the fish swimming around

A tempting sight for many predators.





## HINTS & TIPS

1. Remember that any external wiring, especially near water, should always be used in conjunction with a circuit breaker.
2. Any good garden centre will provide you with a good choice of prickly shrubs. Worth considering are Pyracantha, Berberis, Holly, Hawthorn and Blackberry.
3. Remember which stones you've left loose — or it could be you, not the cat, who tumbles in the pond!
4. If your garden is ever visited by small children, toddlers or babies, ALWAYS cover the pond securely with strong mesh.
5. Be careful when using netting or cotton — it can trap small birds.
6. If you're using canes around your pond, top each one with a rubber stopper. It only takes a moment to do, but can save an eye being poked out.
7. Finally — don't get so paranoid about predators that you forget to enjoy your fish. Fishkeeping should be fun!

but fail to master the required twirling flick of the paw and so never actually catch anything. Most of the above deterrents will work with them too. (But not a 12 bore shotgun, please).

Paving stones at the edge of the pond, cunningly arranged to overhang the water, give the fish places to hide out of cat view — as does covering much of the water surface with water-lilies, fairy moss or similar. And if the stones can be laid in such a way so that they rock when a cat stands on them, you'll find that all the moggies will learn to give the stones a wide berth — they won't want to risk getting dunked in the water. Another trick is to place pieces of pipe into the water so the fish can quickly take refuge.

Of course, one of the best cat deterrents is a dog, and as dogs don't normally enjoy angling, your pond should be safe. It's also worth considering keeping a cat of your own which you have trained not to dabble for fish. Yes, it can be done, with a bit of patience and judicious use of a water pistol. Hopefully your cat will regard the pond and garden as its own territory and repel any visiting felines.

It's now possible to buy an ultra-sound cat scarer, which scans the garden and emits a high-frequency sound when it detects movement. The makers claim the noise will frighten cats away but won't affect fish or other creatures. This device can be powered by a battery or, alternatively, powered by a mains adaptor. I've never had cause to try one of these gadgets as the only cat in my vicinity is a geriatric moggy who hates the taste of fish!

Several other electronic devices have come onto the market in recent years.

These normally consist of low voltage mains units or batteries connected to wires which encircle the pond. The wires are supported by vertical rods at regular intervals. If the wires are touched, they emit a mild electronic pulse, completely harmless to children, pets or wildlife — but even so they will make any predators think twice before brushing against the wire again. It goes without saying that any electrical gadget used by a pond should be connected to a circuit breaker.

The worst predators, however, without doubt, are human thieves, who creep into gardens to steal fish from ponds. Angry though we may be with cats and herons, at least we know that they are only following instinct and know no better. They aren't stealing for monetary gain.

So, what can you do to protect your fish from humans? Security lights are excellent of course if the burglar happens to come at night, but many thieves work in the daytime and you can't really put locks round your pond, or mark your fish with an ultra-violet pen as you do to your indoor property. It is possible, nowadays, to microchip or tag fish, but for the average fishkeeper this isn't really practical. Likewise, insurance can be considered, but the cost of premiums must be weighed against the value of the fish, and unless the more expensive varieties are kept, insurance might be found to be an uneconomic proposition.

It might be worth remembering, however, that thieves hate thorns — and a good thick hedge of Hawthorn, Pyracantha, or other prickly bush, planted around your garden's perimeter, could well be all that's needed to keep your fish thief-proof. Any DIY store nowadays has a good selection of alarms, ranging from the basic buzzer kind which can be wedged under a gate or connected to a shed door, to elaborate systems which can be placed around ponds and gardens using infra-red sensors, pressure sensitive pads, movement detectors, or a combination of all three.

Hopefully, some of the above ideas should keep the occupants of your pond safe, not only from the predators already mentioned, but also from marauding magpies, robbing rooks and even kamikaze kingfishers. Soon, however, all our problems might well be solved, because even at this moment my son is working on his brilliant new invention — a predator-ejector seat. Basically this consists of a fake paving stone, which is sited at the edge of the pond. Beneath the stone is coiled a powerful spring.

Watch this space for more details!

I am indebted to Starsmore & Co for photographic assistance.

## AQUAPLANTON



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## PRACTICAL WATER GARDENING

### To UV ... or not UV?

#### 3-POINT SAFETY CHECK

- Use RCD on electrical supply
- Never look at a lit tube
- Provide some protection against the weather

algae, as you would your dreaded Blanketweed. But you know they are there by the fact that you cannot say "there are my fish" either! As the nitrates build up, and the temperature shoots up, your alga bloom increases, and invisible become your fish, as they disappear into the pea soup, as the fog of green water is affectionately known. This also has the inherent danger of fish losses due to oxygen depletion, as algae join plants in consuming vast amounts on hot summer nights.

So how will the UV help? The single cell algae that we have established are frantically breeding in our water, are getting pumped or flowing through, our filter systems (but are much too fine to be filtered out) therefore returning to the pond to continue their frustrating work. But put a UV in the system and bombard them with the ultra-violet rays, and the enemy is coagulated. That is, clumped together. Now when they next pass through the filter, they do stick, and are filtered out.

#### WHAT IS A UV UNIT?

The coagulation process is begun inside the UV unit by passing the algae-laden water as close as possible to the UV light creating tube, this is made possible with the use of the quartz sleeve and the outer casing, as can be seen in the diagram.

So basically the UV unit is installed in the pumping system. With separate 'add-on' units, the usual advice is to situate it after the filter as in this way the unit is always dealing with clean water, thus preventing the build up of debris and limiting the effect of the rays. However, if doing so were to create a major plumbing problem, then an installation prior to the filter is acceptable, with the limitation in effectiveness being minimal as long as regular cleaning of the unit is carried out.

Many pond filter manufacturers offer either fully-integrated units or 'upgrade

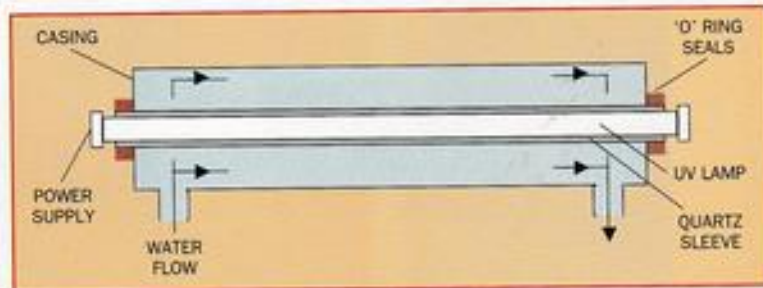
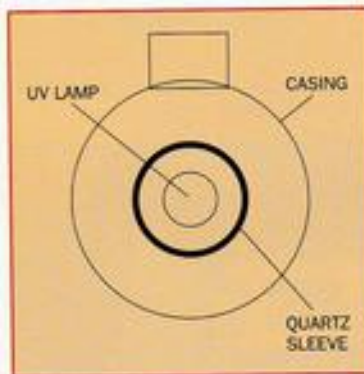
units' which can easily be fitted to existing external box-type filter systems.

A good point to bear in mind at installation time, is to make the unit easily removable, while leaving the system still pumping on a bypass. This allows for cleaning and most important winter storage. There is no advantage to be gained from running the unit in the winter and risking a freeze up, and damage, in severe weather.

#### MAINTENANCE

So an autumn routine should be to carefully strip down the unit. Clean the quartz sleeve, checking 'O' rings, and fitting a new lamp. The effective life of the lamp is only six months, so it makes sense to have a new one fitted for the start of each season. Then safely stored away from frost, your UV unit will be ready to reinstall in the Spring, and serve you well for many years to come.

The units are self contained, with integral starter unit and water-proofed electrics. However, it's a wise move to afford the unit some protection from the rain, as although they are water-proofed, but do not really want to be sitting in a puddle! It goes without saying these



#### TIPS

- Start each season with a new tube
- If in doubt go for the larger size
- Store for the winter

days, that an R.C.D. should be used during installation of electrical supply.

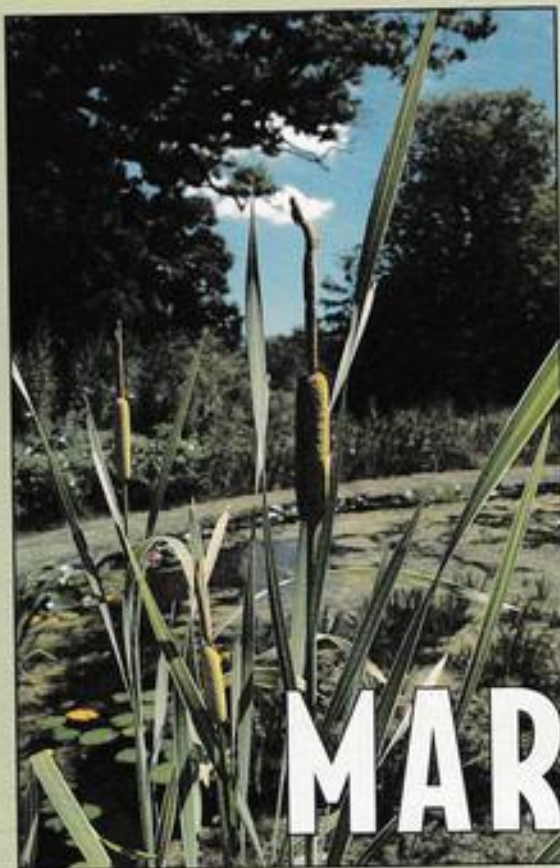
Manufacturers have almost standardised the sizes of UV units, that is in terms of power, eight, fifteen and thirty watt models are the norm. The physical shape has varied and some models even have internal turbulators in the water flow, to lengthen the water flow course thus improving contact time. Another way to lengthen the exposure time is, of course, to regulate the speed of the water flow through the unit, slowing the water flow by means of a restricting tap is one way or, alternatively, only allowing a smaller proportion of the main water flow to pass through the unit by means of a T junction feed and return.

The factor governing which model you choose being the gallonage of your pond. Fifteen watts is thought to be the size for a 3,000 gallon pond. From this you, with the help of your supplier, can estimate the size you require. Better to pump for the larger size if in any doubt. You cannot really do any harm with a unit that's too large (it'll simply clear the green quicker), but too small and it would be much less effective.

#### WARNING

A point of warning, do not be lulled into a false sense of security, believing that the UV is a cure all. This feeling comes about as they are often advertised as UV sterilizers. They have indeed been used in the water industry





Bullrush, *Typha latifolia variegata*.

# UNDER-RATED MARGINALS

**M**arginal aquatics are amongst the most decorative pool plants. They play second fiddle to the Water-lilies of course, but while rarely being as spectacular they often offer a much longer season of colour and interest.

## MARSH MARIGOLDS OR CALTHAS

These are amongst the earliest to flower and in recent years have become the most complicated for naming, botanists having moved them about until nobody but the expert knows which is which. I am going to continue referring to them by their traditional names, the ones that are mostly used by the aquatics trade.

There can be few people who are not familiar with our native Marsh Marigold, *Caltha palustris*, an outstanding swamp plant

PHILIP SWINDELLS PROVIDES PLENTY OF SUGGESTIONS FOR HIDING THE BORDERLINE BETWEEN WATER AND LAND.

• PHOTOGRAPHS BY KEITH LAMBERT •

*C. palustris*, 'Flore Pleno'





with dark green foliage that is garlanded during late spring with waxy blossoms of intense golden-yellow.

There are a number of variations of the common Marsh Marigold, the most popular being *C. palustris* 'Flore Pleno'. This is a plant of great beauty bearing a profusion of waxy fully double flowers of the deepest golden-yellow.

The white form of the Marsh Marigold, *C. palustris* *alba*, is a complete contrast. An over-rated plant with single off-white flowers with golden stamens and dull, rounded, scalloped leaves. Apart from not being as showy as its yellow cousin, it is also very prone to mildew, early attacks being seen by the end of April.

The much-neglected Mountain Marigold, *C. leptosepala*, is a far better proposition, producing broad white blooms with a distinctive silvery tinge above splendid dark green foliage. A variety of this, called *C.I. grandiflora*, has even larger white flowers.

However, it is not the giant of the family, this is the Himalayan Marsh Marigold, *Callia polyptala*. A handsome fellow with dark green leaves up to 10in across and huge trusses of flowers on stems quite 3ft high.

All the Marsh Marigolds are very tolerant, growing equally well in damp soil or up to 1ft of water, but being more neat and attractive under shallower conditions. They are increased by either seed or division, the double form being propagated from division alone.

## AQUATIC IRISES

Aquatic irises tend to follow marsh marigold in the summer parade of colour. The most popular is the bright blue-flowered, *Iris laevigata*, which sports its handsome blossoms during June amongst smooth green sword-like foliage.

There are many named varieties of

*Iris laevigata* 'Rose Queen'.



this lovely Iris, some of which are of dubious origin, but all being gathered under the collective name of the *laevigata* group. *Iris laevigata* 'Alba' is quite naturally white, 'Monstrosa' violet and white, and 'Rose Queen' pink. However, one of the most striking is 'Variegata' or 'Elegantissima' which has bright cream and green striped foliage and lovely soft blue flowers.

Our native Yellow Flag, *Iris pseudacorus* is too vigorous for most garden ponds, but it has yielded the refined primrose-yellow *I.p. hastanii* and the bright yellow 'Golden Queen'. Amongst the marginal plants grown for foliage the yellow and green striped 'Variegata' is superb.

## WATER PLANTAINS

The water plantains are most interesting acquisitions for both the manicured garden pool and the wildlife pond. The most familiar is *Alisma plantago-aquatica*, a handsome native with attractive ovate leaves and loose panicles of pink and white flowers. The broad towering spires become hard and woody after flowering and persist in skeletal form throughout the winter.

The North American, *A. parviflora* is of similar habit, but with distinctive rounded leaves that during autumn and winter fall into the water and become completely and most beautifully skeletonised. Its pyramids of pink and white flowers are shorter than those of our native kind making it a much better proposition for the smaller garden pool.

*Potamogeton nodosus* or Pickerel Weed, makes a lovely contrast. A superb North American native it produces numerous stems each consisting of an oval or

lance-shaped shiny green leaf and a leafy bract from amongst which soft blue flowers emerge during late summer. A most dignified plant, up to 3ft high, which is easily increased by spring division.

If you grow this, then you must also consider the Flowering Rush, *Botanophila umbellata*, for this blossoms at exactly the same time as the Pickerel and is most effective when



*Iris pseudacorus*, Yellow Flag.

planted in harmony alongside. A remarkable plant consisting of only one species in its own unique family, it produces spreading umbels of bright rose pink flowers from amongst clumps of narrow triquetrous foliage.

Underplant with the Bog Arum, *Calla palustris*, for good effect. This is a very useful creeping plant for establishing around the base of taller marginals and for masking the edge of the pool. It spreads by means of rhizomes which are clothed in handsome glossy heart-shaped leaves. Its flowers are very similar to those of the florists' Arum, being smaller and appearing as tiny white sails in a sea of dark green foliage.

They are followed by spikes of succulent red berries filled with viable seed, which if sown immediately it ripens, germinates freely. The winter buds which form on the long trailing rhizomes can also be used to increase your stock, rooting freely if placed in trays of very wet mud.

The Arrow Arums are related to the Bog Arum, but are much less known. There are two species available both of which have great similarities. *Peltandra virginica* is the one most likely to be seen at the garden centre, a handsome fellow with dark green, glossy arrow-shaped foliage amongst which narrow pea-green spathes are produced. These arise from a short fleshy rootstock which divides readily to form new plants.

*Peltandra alba* has slightly larger greenish or white spathes but it



## PRACTICAL WATER GARDENING

### Under-Rated Marginals



*Potamogeton alba*, Pickerel Weed.

otherwise the same. Although I feel that this is the better garden plant it is not as frequently seen for sale.

Nor is *Preslia cernisa*, one of my favourite marginal subjects. I can never understand why because it is a most useful plant and very easy to propagate. A scrambling plant it forms spreading clumps of slender erect stems which are densely clothed in small lance-shaped leaves.

In the summer this easy going little fellow is crowned with stiff-whorled spikes of dainty blue or lilac flowers. The whole plant is strongly aromatic and is happiest when growing in very shallow water. It can be easily increased from short stem cuttings taken during spring and early summer and inserted in a pot of very wet mud.

Water Mint, *Menka aquatica*, is aromatic too, but this is altogether more boisterous. It loves to colonise shallow water or mud at the poolside and when growing happily produces dense terminal whorls of lilac-pink flowers on slender reddish stems amidst an abundance of greyish-green foliage.

There are many hybrids between Water Mint and other species, however, they are all worthwhile plants if you can exercise some control. Propagation is by division or short stem cuttings taken during the summer and rooted in a tray of mud.

Water Forget-Me-Not, *Myosotis scorpioides*, is another unruly character for the waterside. It is not as invasive as Water Mint and is very happy when mixed in and amongst it. A perennial cousin of the popular bedding Forget-

Me-Not, this charming native becomes absolutely smothered in sky blue starry flowers. An improved variety called 'Semperflorens' is even better, being of neater habit and with many more flowers.

Water Forget-Me-Nots are easily raised from seed, although division of the emerging crowns in early spring is usually successful. The main advantage of seed raising is that occasionally a white form may appear, this can then be perpetuated by division.

The Bog Bean, *Menyanthes trifoliata*, is a fascinating late spring flowering marginal plant for very shallow water. It has decorative white fringed flowers above dark green trifoliate leaves which look remarkably like those of the Broad Bean. Both the leaf and flowers are protected by a short scaly sheath situated towards the end of each sprawling olive-green rhizome. If the rhizome is chopped into sections, each with a tiny piece of root attached, the plant is easily increased.

The Lizard's Tail, *Sagittaria arifolia*, can only be propagated by division, but it grows away quickly and forms lovely clumps of heart-shaped foliage, which often turns bronze or copper in the autumn. During summer it produces quaint nodding terminal sprays of creamy-white flowers. A great curiosity which is now becoming more popular, having until two or three years ago been on the international list of endangered species.

There is no fear of Brooklime, *Veronica beccabunga*, becoming threatened, for it grows with great gusto. The only truly aquatic member of this very popular genus of land plants, it has typical bright blue flowers with a distinctive white eye. Here the similarity ends, for these are not produced in familiar terminal spikes, but in the axils of the leaves of trailing procumbent stems.

Brooklime, although not a spectacular plant, has many uses and is invaluable for climbing out of the water and masking the area where the pool meets the surrounding soil. It will also spread across the surface of the water, providing shade for the fish

and its hanging roots an excellent place for the deposition of spawn.

Finally no review of marginal plants is complete without the mention of reeds and rushes. Not the tiresome Reedmaces or Free-Seeding *Juncus*, but the true Rushes or *Scirpus*.

The commonest is the true Bulrush, *Scirpus lacustris*, a useful if somewhat uninspiring architectural plant for shallow water. It has stiff dark green needle-like leaves which arise from short creeping rhizomes and during summer are crowned with pendent tassels of reddish-brown flowers followed by clusters of insignificant triangular fruits.

A close comparison is the Glaucous Bulrush, *S. tabernaemontani*, a similar plant, but with steely-grey foliage with a conspicuous mealy bloom. Although garden-worthy in its own right, it is its mutation known as 'Zebra Rush', which is the most remarkable of this important family.

This has stems which are alternatively barred with green and white. It rarely grows more than 3ft high and is one of the most outstanding marginal plants for the modern water garden. As it is a freak of nature, plain green stems will occasionally be produced and these should be removed immediately or the whole plant will revert back to type.



*Myosotis scorpioides* 'Maytime', Water Forget-Me-Not





The ponds with bog garden and 'meadow' beyond.

PHOTO: BOB & VAL DAVIES

## THE PUB WITH NO BEER

### BOB & VAL DAVIES FIND AN ANALOGY IN THE GARDEN TO WRITE ABOUT.

**T**o fishkeeping pond-owners the title may seem appropriate since we maintain a garden pond without fish — it was in fact constructed purely for native amphibians and any other wildlife which might colonise it and, unlike the pub in the old song, is anything but a 'dreary old place'.

Pondkeepers will know that a garden pond eventually becomes home to a variety of aquatic life and therein lies the fascination for us. One of us spent his childhood days in an area which boasted a huge number of ponds from small temporary pools to almost lake-sized 'flashes' caused by mining subsidence. Sadly some of them have been filled in over the years, including one that contained at least seven species of fish. However it left a lasting legacy in the form of an interest in all things aquatic, so when we moved to our present house, some 20-odd years ago one of the priorities was to sink two small pre-formed plastic pools in the rear garden and surround them with a small rock garden. The following Spring, to our delight, frogs appeared in them. The neighbouring garden had a huge depression which was used by the frogs for spawning but



tended to dry up in summer so it was an easy step to colonise our ponds.

The garden next door was eventually drained which meant that our little ponds were almost solid with spawn every Spring so it was decided to construct something larger. Articles on pond construction have appeared many times in *A&P* and there are several books on the subject, so without going into construction details, a pond some 7ft (2.15m) by 5ft (1.5m) by 2ft (60cm) deep was dug and lined with butyl. Having decided a small bog area would be desirable, the two plastic ponds and several old sheets of polythene were buried at one end of the pond thus producing a marshy area (very small in fact, as the garden is not very big). One end of the pond was made slightly lower than the other so the overflow would maintain the moist area. This was a mistake — it means that 2in (5cm) of pondliner are always visible at one end, but at least the bog garden flourishes. A small 'humpback bridge' was built over the junction between pond and bog to give access across. The pond was surrounded by a rock garden (another passion) with a path down one side for easy viewing. It was an instant success, producing large amounts of frogspawn every Spring.

Several cuttings of Canadian Pondweed soon multiplied — this plant needs frequent harvesting, and somehow Willowmoss also became established. Baskets were used for various marginal plants which include Marsh Marigold, Lesser Spearwort, Water Forget-Me-Not, Blue and Yellow Mimulus, Cotton Grass, *Iris laevigata*, Bogbean and *Loëlia*. A small red water lily, *N. fraxinifolia*, was added — this provides an attractive splash of colour on the surface every year.

The result was pleasing to the eye but many of the plants are so vigorous they were soon out of control. The *Iris* multiplied, split its basket and eventually had to be hauled out and divided. Even Water Forget-Me-Not and Lesser Spearwort need controlling and the Bog Bean subjected to savage pruning to avoid the pond becoming

choked. The small bog garden was planted with a selection of moisture-loving plants some of which, we discovered, need a larger area than was available. The tall, stately plumes of Purple Loosestrife made a beautiful centrepiece but runners were soon popping up all over the place. Three years ago it was decided to dig it out but even now we still find shoots emerging here and there. Another mistake was Square-stalked St. John's Wort which proved too prolific — it reproduces by runners and by seeding, not only did it start to take over the bog area it began to appear all over the rest of the garden. Eventually the bog garden was replanted with less invasive plants such as dwarf *Astilbes* which flower at different times, *Trollius*, Marsh Marigold, Cowslips and

Frogs spawning

PHOTO: GORDON WIGENS



*Primulas* for Spring colour, *Iris kareppferi* and *Iris sibirica*, *Zantedeschia*, *Hottentya*, Day Lilies, Red Montbretia, *Loëlia cardinalis* (for late colour) and *Primula vialii*. This latter plant is extremely attractive and worthy of a place in any garden.

The bog garden provides a suitable 'stepping stone' for newly-metamorphosed froglets when they leave the pond to disperse into the surrounding garden. Beyond the bog garden is a 'meadow' area which is planted with Popples, Cornflower, Corncockle, Corn Marigold and Ox-eye Daisy as well as more traditional garden plants. This also provides cover for the froglets during their dispersal as it is thickly planted.

Frogs would seem to be more opportunistic colonisers than the other native amphibians — they are usually the first to adopt garden ponds. Toads and Newts are evidently more reluctant to move but they will sometimes appear

in your pond. Although Toads of varying sizes are often seen in our garden during Spring and Summer they have never colonised the pond and throughout its existence only two female Smooth Newts have been observed one year. The surrounding area is quite well stocked with Great Crested Newts but they also have not been attracted which is probably just as well since Newts would prey on the Frog tadpoles.

Having finished the 'frog pond' it seemed a pity that fish could not be housed in it so out came the spade and a small 'fish only' pond was dug next to it. This houses four Goldfish and two Golden Orfe and is just as much a source of pleasure and interest as the other pond. Every Spring, one or two pairs of frogs spawn in this fishpond. If the frogs are removed when in amplexus they will often crawl back so the spawn is transferred to the amphibian pond as the Goldfish would make short work of any tadpoles.

Over the years a fascinating array of other creatures have colonised the main pond. The layer of fine mud on the bottom is home to *Tubifex* worms which can be observed wriggling in small volcano-like tubes, the Water Hog Louse is another inhabitant. *Daphnia*, *Cyclops*, *Ostracods*, *Glassworms* and *Blood Worms* also flourish at various times — in fact

areas of the pond are often red with *Daphnia*, which, together with the other items mentioned, are netted to provide food for baby Alpine Newts which we breed — thus the pond is not only ornamental but useful as well. In addition a host of other tiny inhabitants such as the small red water mites can be seen. For the pondkeeper interested in microscopy the pond is fertile territory — it is fascinating to observe *Hydra*, *Euglena*, *Stentor*, *Amoebae* and similar minute creatures.

Fortunately very few pests have ever colonised our pond. A Great Diving Beetle was netted and removed, Lesser Water Boatmen appeared one year — some were netted but the others eventually disappeared. The only other predatory creatures were a few Dragonfly larvae which were also removed. It could be argued that these predators are part of a natural system and should be left but in view of the size of the pond and the potential havoc they could cause it



## PRACTICAL WATER GARDENING

### *The Pub With No Beer?*

was decided to banish them. Soon after the fishpond was finished to our dismay we had four visits from a Heron who perched on the fence eyeing up the pond. Thankfully it has not been seen since — the potential pickings in our ponds must have been of no interest. Other creatures which seem to come and go are Pond Skaters, Whirligig Beetles and some small unidentified beetles — occasionally Caddis Fly larvae are spotted crawling around in their camouflaged tubes. Two other pests, plant not animal, have also taken up residence — the Common Duckweed and the Ivy-leaved form. The latter appeared only last year (1995), both are a nuisance and need frequent netting, first picking out any tadpoles which are caught up.

Green water is seldom a problem — as the sun's power in Spring increases so do the *Daphnia* and other 'filter feeders'. The growth of hairy algae on the liner is grazed to pristine condition by the large number of tadpoles so the pond is largely problem-free, the only maintenance being the control of plants and removal of dead leaves.

In the early days frogs which overwintered in the two small, shallow ponds were often killed when ice formed but these fatalities have been reduced in the deeper pond. A minimum depth of some 20in (50cm) or so is probably necessary to safeguard the frogs. One other fatality, regrettably, was a female Hedgehog and her four babies — following this the pond surround was altered to provide easy egress for such creatures. For froglets also it is important that they can leave the pond easily, formal ponds surrounded by a uniform layer of flagstones may make this difficult.

To sum up, a pond in your garden can be a never-ending source of interest.



Male Great Crested Newt.

PHOTO: BOB & VAL DAVIES

There is something peaceful and relaxing about a pond although there is usually some activity if one looks closely enough, except in the depths of winter. It is also gratifying to think that your pond and garden is a small haven for wildlife in these days of pollution and destruction. Natural ponds have disappeared at an alarming rate over the last few decades and some will continue to do so. We cannot stop 'development' but there are various local and national

initiatives to save and improve ponds — your local authority may have a wildlife department which you could contact. Garden ponds are now important refuges for native amphibians — why not make your own if you don't have one already? You will have to be patient as you await its colonisation.

Transferring amphibians from other ponds might be unsuccessful — they may or may not stay in your pond. Spawn transfers from other ponds can transfer disease and is not generally recommended nowadays — apart from habitat loss frogs in many parts of the world (not just Britain) are subject to mysterious diseases and wipeouts which are being investigated. You may think that you are doing the frogs a favour by removing spawn from an apparently overcrowded pond but large numbers of tadpoles in relatively small pools are a natural phenomenon.

The type of pond and its surrounding habitat may well determine its success as an amphibian haven. There are books, articles etc. on wildlife gardening — do as much research as possible before starting. Amphibians also have a terrestrial stage outside the breeding season and need suitable hiding places away from the pond. A tidy, formal garden is less attractive to them as it offers few refuges, although hiding places can be created. As with Hedgehogs it pays to examine rubbish heaps,

piles of leaves etc. before burning in Autumn — there could be amphibians under them. Since Slow-worms are spotted in our garden extra vigilance is required when digging. Take care also when mowing the lawn as the froglets could be on the move this has never been a problem for us as they usually set off via the bog garden into the 'meadow' and disperse into the surrounding area.



Smooth newt (*Triturus vulgaris*).

PHOTO: DAVID BEVAN

#### FOOTNOTE:

Great Crested Newts and Natterjack Toads are protected by law. They, their eggs or tadpoles must not be collected for introduction to your pond.



# COLDWATER Q&A

**Q** Most years my goldfish breed. There are now several generations of fish in my pond. Some of the offspring have changed to the same colour as their parents but, not all of them. Why is this?

**A** I must presume here, that we are talking about metallic-scaled, orange-coloured, goldfish and not the multicoloured or 'calico' Shubunkin type. The original colour of goldfish is, believe it or not, the olive-brown shade which we generally refer to as 'uncoloured'. By this we mean that the fish has not undergone the loss of black pigment which results in the fish becoming 'a gold fish'. Left to their own devices, a colony of goldfish will, sooner or later, revert to producing almost 100% olive-brown or bronze-coloured fishes. It is only by careful selection that we can maintain good strains which decolour early in life and so produce the brightly coloured fish we prefer.

This selection process began a long time ago in China, where a kind of carp was kept as food for the table. At some point it was noticed that gold-coloured specimens occurred and these were singled out and kept. Other variations, such as twintails etc. came later. Sports like this happen frequently in nature but, due to predation, rarely survive long enough to reproduce. By intervening, the fishkeepers in China were able to select these 'different fish' and soon developed the strains which were the ancestors of those we have today.

Even after centuries of controlled breeding, goldfish will still produce some offspring which closely resemble their ancestors. Allowing these fishes to interbreed with otherwise 'good stock' can quickly undo a few hundred years of painstaking selection.

If you are a fishkeeper who simply enjoys his (her) fish, whatever the shape or colour, then there is no problem. However, if your aim is to produce good quality goldfish, then selection and culling is essential. This is true not only for the highly exotic types, but for the common or primary goldfish as well.

All metallic-scaled goldfish, when young, go through a stage during which they are bronze-coloured. As they mature many of these fish will begin to change. With a good strain this can be better than 90%. How long this takes will depend on a number of things; in warm climates, fish grow and mature quickly and, under these conditions, decolouring can happen within a few weeks. Unfortunately the British climate is not so helpful, and so, fish produced in our outdoor ponds take much longer. Sometimes early spawnings can be sorted before the end of the season but, more often than not they will need more time. Personally, I expect metallics reared outdoors to decolour within 12 months; those reared inside the fish house need to prove themselves much sooner if they are to impress me. There is nothing wrong with letting fish reproduce 'at will' in the garden pond, however some form of control needs to be exercised if the quality of the stock is to be maintained.

**Q** Since I became a goldfish fancier, I have found that many fancy varieties seem to develop 'swim bladder trouble'. Is this condition a disease, or the result of breeding fish with round bodies?

**A** It is certainly true that developing Fancy Goldfish with body shapes which displace or distort the internal organs is a major factor causing this condition. It is not however, the only factor. There is plenty of evidence to show that some strains of 'round-bodied' goldfish are relatively free of this problem; at the same time, fishes with 'normal' body shapes can be affected. I am not an expert in this field, but I think it is safe to say that some fish

diseases can and do affect the swim bladder both directly and indirectly. The average hobbyist (of which I am one) does not have either the facilities or the expertise to properly diagnose such problems, therefore, if disease is suspected, professional help is needed. In any case, other aspects need consideration.

Many years of experience with Fancy Goldfish has led me to believe there are three main 'triggers' which can bring about this condition. The first one is the hereditary factor. Some deep-bodied strains have their organs so rearranged that a failure of some kind is almost inevitable sooner or later. Often the individual fish will appear quite normal when young. As the fish grows and matures it develops a 'swimming disorder'. Sometimes this shows itself when the fish becomes 'heavy' and can only rise from the bottom with a great deal of effort. More usual is the situation where the fish floats, either on its side or belly upwards, at the surface. In some cases this may occur only after feeding, and an hour or two later the fish may seem fine. This is because food has expanded the intestine which in turn has put pressure on the swim bladder. Careful feeding can help but, the prognosis is not good. This brings us neatly to the second factor.

Poor feeding can bring about digestive disorders. Be in no doubt that constipation can be serious in goldfish, as can any digestive malfunction. In such cases one of the many consequences may be a swim bladder problem, especially if the particular fish has a redesigned interior.

The third factor which seems to trigger this condition is temperature. Or, to be more precise, changes of temperature. It is well known that any sudden temperature change is harmful. The same can also be said when a fish is taken from one temperature to another in too short a time. Goldfish, like all other fishes, are complex living things which need time to adapt, adjusting their body chemistry to changes in their environment. Did you know, for instance, that a fish's blood chemistry alters to suit different temperatures? Failing to allow a fish time to make these adjustments is certain to create 'mechanical' problems. It is also my belief that upsets of this kind can be cumulative, with the effects showing themselves at a later date for no apparent reason.

Just occasionally a fish may show typical symptoms for a short time and then recover totally. I have seen this happen with heavily egg-laden females prior to spawning. Any such fish will need watching closely of course, and must be regarded as suspect. Various treatments have been suggested for this disorder, these include shallow water, raising the temperature, adding salt, etc. I have tried all of these at different times without any lasting success. In fact I think the only times I have effected a 'cure' is when the condition was only temporary and the fish would have sorted itself out anyway.

Generally speaking, goldfish are hardy and adaptable creatures, which is why they can often survive in spite of the adverse conditions we subject them to. In some cases, you might say that 'swim bladder trouble' was a fish's way of saying: 'I've had enough'.

QUESTIONS FOR THE GOLDFISH Q&A SHOULD BE  
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# out & about



**Tableau Winner:**  
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**Fish of Fish:**  
*Pterygoplichthys*  
*gibbiceps*, S. and S.  
Crich, Sutton AS  
**Best Exhibit:** Mr and  
Mrs P. Jones, CAST 88  
**AquaChamp Qualifier:**  
Anthony Fisher,  
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**Highest Society:**  
Lincoln & DAS  
**Best Trade Stand:**  
Aqaarist &  
Pondkeeper

## YORKSHIRE AQUARISTS FESTIVAL

**N**obody participating in them loves a long queue but, to the organisers of this year's 22nd Yorkshire Aquarists Festival, or Fish Fayre '96 as the sign said outside Doncaster's racecourse, it looked to be a good omen as it stretched back from the entrance and down the pavement. Even so, some were afraid to 'count their chickens' fearing that the Saturday crowd might have been at the expense of Sunday's. In the end, everything turned out to be fine with both days seeing larger than usual crowds coming in to see the attractions. But let **Marie Harrop**, Secretary, Yorkshire Aquarists Festival, tell you how it went:



YAF '96 Main Hall.

PHOTO: OED





YAF '96 Organisers.

PHOTO: GED

Something fishy is happening down at Doncaster Racecourse this weekend! was the introduction given on BBC's Look North programme, screened on Sunday tea-time at just about the same time as the YAF Chairman, Ray Stansfield, was announcing over the P/A System: "Ladies and gentleman. The Show is now closed, thank-you for coming. Will you please leave the hall as quickly as possible, etc., etc."

We obviously did not make any further financial gain in the way of extra people through the door, but what a great and popular weekend YAF is becoming when we can actually make tea-time viewing at the end of the news bulletin; as well as TV we also made two radio broadcasts on Saturday morning. It just goes to show that the interest is there and building all the time.

Hundreds of show fish had been judged on the Friday afternoon, and the winners were proudly displaying stickers

and rosettes on their tanks they positively departed with pride, and that was just the fish! Activities by the score were taking place: a pig-roast at Knitlot Castle from Lincoln Imps; Les Barker from EAC appealing for his lost birds, his winning Dovecote had been deserted or abandoned; Lilliput village had been re-created by Bradford complete with stream containing White Cloud Mountain Minnows; the home team, Doncaster, gave everyone a thrill with a Teddy Bear's Picnic; and we all learned a little about Origami and Japanese Gardens from the Lincoln & District team. Little wonder there was not much peace and quiet down at Sea-horse Farm owners and breeders. Cast 88 These were just a few of the many imaginative tableaux entered.

Three well-known and very popular gentleman, David Armitage, Brian Walsh and Dr David Ford, gave their time and conducted lectures over the weekend. The large room was packed to overflowing for all three talks and it really was a case of

and rosettes on their tanks they positively departed with pride, and that was just the fish! Activities by the score were taking place: a pig-roast at Knitlot Castle from Lincoln Imps; Les Barker from EAC appealing for his lost birds, his winning Dovecote had been deserted or abandoned; Lilliput village had been re-created by Bradford complete with

'Standing Room Only' — what a treat we had.

The ever popular 'Marine Corner' was well supported and had an even bigger and better display — watch it lads, you are only having the bottom end of the Hall, no take-over bids please and, next year, don't put the big snake next to our jewellery lady, it kept peeping at her and she's none too keen; not a reptile fancier I think! However, one Trade Stand specialised in reptiles of all varieties, and this proved to be a real crowd puller. There was plenty of interest being shown, so hopefully people will be able to learn how to care properly for the species which they decide to keep.

A new concept this year was 'Beginner's Corner'; this was born from an idea the Organisers had from watching the new hobbyist who seemed a little frightened to approach the 'professionals' and what a popular attraction this proved to be, perhaps it filled a little hole we were not fully aware of.

Prior to the Festival the Organisers had circulated a questionnaire, asking Clubs, Societies, Traders and Fishkeepers several questions on what could be done to improve the Festival. One point came over very strongly, move the Yorkshire Stand, Fish of Fishes and Trophy Stands into more prominent positions.

We took this on board and relocated



ABOVE  
The happy grin on this Pirgyppliktálys gákkúrs says 'I've won the Fish of Fishes!'



LEFT  
Best in Show was this Spadotris angelicus.

PHOTOS: A&P LIBRARY



# Tip



*Parachanna ineri*,  
Neon Tetra.  
PHOTO: MP. & C. PRZYMOR

# Top

## TETRAS

**A**quarists starting to keep fish for the first time usually have a mixed community aquarium containing a wide range of fish, including some Tetras. Later on this mixed community aquarium tends to be phased out in favour of specialist setups containing say, Malawi Cichlids, Livebearers or some other group of fish which holds a particular interest for the hobbyist concerned. This was the way my hobby went until about five years ago when I expanded my horizons again to include a wide variety of fish. Nowadays I have several large tanks devoted to a wide range of normal community fish, as well as my 200 aquarium breeding establishment. Of all the community fish which have made a "comeback," the ones which have taken strongest hold and which have gradually been increasing in number and diversity are the lovely Tetras.

Tetras come from both Central and

### DEREK LAMBERT LOOKS AT SOME LONG-STANDING AQUARIUM FAVOURITES.

South America as well as Africa. This natural distribution of Tetras both on the American and African continents has been used by scientists to back up the theory that these two continents were at one time joined together. Looking at a distribution map of Characins you will find the vast bulk of species concentrated around the Equator with the limit of northward distribution just to the north of the Tropic of Cancer on both the American and African continents. Fitting the two continents together you can clearly see how this distribution of Characins on both continents backs up this theory.

From a scientific point of view, the term "Tetra" really has little meaning. Unlike Rasboras, the fish which aquarists call Tetras (incidentally, the word Tetra comes from *tetragonopterus*, meaning square fin) belong to a wide variety of genera rather than just one or two. What aquarists seem to mean by the term Tetra is any small pretty characin which can be kept in a community aquarium. All have a single dorsal fin on the back, and many also have a second single dorsal fin, usually called the adipose fin, positioned above the end of the anal fin. The anal fin is usually large in relation to the body and in most cases is long-based (often concave in males) and much bigger than the main dorsal fin.

One thing which all these fish have in common is that they belong to the order of Cypriniformes which have Weberian Ossicles (also called the Weberian Apparatus). This structure is derived



## TROPICAL Tip Top Tetras

from the first four vertebrae and forms a link between the inner-ear and the swim-bladder. The swim-bladder acts much like a sounding board enhancing any sound or vibration which is then transmitted to the inner-ear. This means Tetras have much better hearing than many other fish and when coupled with excellent all-round vision they are acutely aware of what is going on around them. In the wild this enables them to find food very quickly and also to avoid predators making a meal of them. I know from past experience just how fast and difficult these fish can be to catch. It's bad enough trying to catch one particular Tetra in a 6ft long aquarium for a fish show, but in Mexico, when trying to catch *Astyanax mexicanus* when they have the whole of the river to hide in, it was nigh on impossible! It was as if they sensed the net long before it came anywhere near them.

Most Tetras are omnivores, eating all foods ravenously. A good quality flake or granular food can be used for their staple diet but try to feed some live food at least once a week. This improves general health and heightens their colours. Most species will only take food from the surface or in mid-water, once it reaches the bottom few Tetras will grub about in the gravel looking for lost morsels. For this reason it is a good idea to include some bottom-dwelling fish, such as *Corydoras*, in even a specialist Tetra setup.

In the wild, most species are found in moderate to fast-flowing streams rather than in still water pools or lakes. Therefore any aquarium which contains Tetras should include



*Tigarris herkleri*, Penguin Fish.  
PHOTO: DEREK LAMBERT

some form of filtration which creates a water current. You only have to watch a school of Tetras playing in an internal power filter outflow to realise just how much they appreciate this water movement. Another characteristic of these rivers is large clumps of growing plants and soft, acidic water which is stained light brown. For this reason I also like to include growing plants in my tanks containing Tetras, and some bogwood. This gives the fish places to hide in to rest and the bogwood releases an acid which stains the water brown and slowly softens and acidifies it.

The aquarium temperature should be kept at between 72°F (22°C) and 80°F (27°C) with sudden fluctuations up or down being avoided if possible. Unfortunately many Tetras are rather susceptible to White Spot and sudden

*Copella arnoldi*, Splashing Tetra — female.  
PHOTO: DEREK LAMBERT



changes in the temperature can cause them to succumb to this parasite. In most cases this is easily treatable with medication but it is always wise to keep an eagle eye open for trouble to catch it as early as possible.

The only other disease problem which can be a particular problem for Tetras is Neon Tetra Disease. Unfortunately

despite its common name this disease is not just limited to Neon Tetras but has been found in other Characins and Carp-like fish as well as Cichlids. Symptoms include loss of colour (in Neons the blue line may fade and become broken), weight and equilibrium. The affected fish will also swim sluggishly and continue to move restlessly about even at night, the muscles can also become reddish.

This disease is caused by a sporozoan called *Plistophora hypnoleucis* which attacks the muscles, liver, kidneys and skin. The complete life cycle of this parasite is not clearly understood but it is known that spores can leave the body via the kidneys and infect other fish in the aquarium. Since there is no known cure, as yet, it is best to remove and put down any affected fish as soon as it is seen (see Euthanasia in Fish, *AGP* May 1996). Fortunately, it is a rare disease which in over 25 years of fish keeping I have only ever seen three times.

There is a huge range of Tetra species available to aquarists today and many make fine additions to a community aquarium. It would be impossible to list them all but here are a few of my favourites:

*Copella arnoldi* — Splashing Tetra  
*Nematobrycon palmeri* — Emperor Tetra  
*Hypnoleucis*  
*herbertaxelrodi* — Black Neon Tetra  
*Hypnoleucis*



## TROPICAL Tip Top Tetras



*Nematobrycon palmeri*, Emperor Tetra — male. PHOTO: DEREK LAMBERT

Just a few specimens mixed in with other Tetras. I obtained some fry of this species from another aquarist who had bred them. Being such a rare fish in the hobby, he brought along the adult male which was a beautiful iridescent pink fish about 3in long. The breeder had decided to give them the common name of Pink Diamond Tetras because of the adult colouration and was selling them to any interested aquarists at an aquatic convention in America. After watching these little monsters chomp their way through every tail in a community tank of fish in less than half an hour, I think the breeder should have called them Pink

Diamond Piranhas! So the moral of this tragic 'tail' is, if you don't want tail-less fish, always be sure of what you are buying before you purchase.

*Iretodonis* — Loreto Tetra  
*Parachanna obscura* — Cardinal Tetra  
*Thayeria chohakui* — Penguin Tetra  
And, of course, the ever-popular  
*Parachanna innesi* — Neon Tetra

look like just another pretty Tetra but after a few months may grow into rampaging monsters. One such species is *Rivulus altipinna* which turned up as

The sight of a large school of Neon Tetras in a heavily-planted aquarium with black gravel as the substrate has to be one of the most stunning furnished aquaria easily put together by a novice fishkeeper.

Finally a word of warning: Tetras are close cousins of the Piranhas and certain species have similar tendencies. In every batch of wild imports some contaminants are present. These may



*Nematobrycon palmeri*, Emperor tetra — female.

PHOTO: DEREK LAMBERT

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I was initially attracted to the stand run by **Kent Marine** by the high standard of the product packaging. One product out of their large range of aquatic reagents and pharmaceuticals drew my attention: Pro-Clear clears green and cloudy water yet contains no algicides which the maker claims poses no threat to fish or plants. The formulation contains a long-chain polymer which attracts algae, bacteria, dirt and other organic materials. These are

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The main interest on the **Interpet** Stand was the new

This year's show was bigger and better than ever with so many innovative and eye-catching products it was difficult to know where to begin.

Although it did not win the coveted award of Best Product, the **Tropical**



**John Allan** were showing new ranges of tanks and furniture. The **Regency** range comes complete with cabinet, tank hood and waterproofed lights whilst the **AquaPuls** range is similar but with the extra luxury of the renowned **Eheim** power filter of that name. Flat-packs enable customers to take-away their purchases more easily; the **Easy-Carry Table**

Stands selection features **Horizon** aquariums and although **Easy-Carry Cabinets** are now available the associated aquariums are coming later in the year. New **Pendant Lights** come in four designs and mostly in three colours: brown, black and white; three models are switchable between 80 and 125 watts.

Details from: John Allan Aquariums Ltd, Eastern Way Industrial Estate, Bury St Edmunds, Suffolk IP32 7AB. Tel: 01284 755051. Fax: 01284 750960.

submersible **UV Filter** but elsewhere the new **Undergravel Filter** also caught the eye: it boasts the largest number of slots in its baseplate (for maximum water flow) but is still able to support the heaviest aquarium decor; activated carbon and zeolite-filled cartridges add to its water purification features. The small **Internal Power Filters** now have extra filter media capacity and are exceptionally easy to maintain and clean.

Details from: Interpet Ltd., Vincent Lane, Dorking, Surrey RH4 3YX. Tel: 01306 881033. Fax: 01306 885009.

**J&K Aquatics** are stocking a new range of CO2 diffusion equipment. The **Proflora CO2 Set** (from **JBL** of Germany) contains a 30gm CO2 bottle and all the necessary accessories including a unique spiral diffuser. At a retail price of £124.99 for the complete kit, this must represent the best value in this type of equipment on the market today. Also available are larger bottles up to 2Kg and the complete range of needle and solenoid valves and other accessories such as CO2 Test Kits and a range of Iron and other fertilisers. J&K have also increased their own treatment product range by eight new

formulations specifically designed for Koi. The products include: **Anti-Ulcer**, **Paracide**, **Anti-Fungus**, **De-Chlorinator**, **Algae Clear**, **Malachite**, **Formulin** and **Aquarivaine**.

Further information from: J&K Aquatics Ltd, Bridgewater Road, Bathpool, Taunton, Somerset TA2 8BA. Tel: 01823 327227. Fax: 01823 327226.

The **Anglo Aquarium Plant Company** had their usual luxuriant display of plants for pond and aquarium on display. One little gem which caught my eye was a variegated **Water Dropwort** (*Oenanthe japonica* 'Flamingo'). A dainty little marginal plant, it reaches a height above surface of 12-15in and will grow in water up to 5ft in depth. The pinnate leaves are variegated in green, white and pink.

Further details: Anglo Aquarium Plant Company Ltd, Strayfield Road, Enfield, Middlesex EN2 9JE. Tel: 0181 363 8548. Fax: 0181 363 8547.

**Norline Nets** have a new addition to their extensive range of British-made nets for pond and aquarium. The heavy duty **Koi Nets** are manufactured from 3/4in aluminium tube with a click-fitting universal joint to the 1/4in fluted aluminium



handles. The handles have various convenient lengths from 2-11ft 6in. The nets come in diameters of 19, 24 and 29in.

Further details from: **Norfine Nets**, 15 The Drift, Fakenham, Norfolk NR21 8EE. Tel: 01328 864959. Fax: 01328 851143.

Halfway round the Show, and time for something to eat. I popped into **Tropical Sea**. How about a Veggie-Burger? No, I'm not joking. Veggie-Burgers are now available for ... Iguanas! These frozen foods, developed by San Francisco Bay Brand Inc and Zoo-Med, come in two sizes, one for juveniles (a different formulation) and one for adults. On a more familiar front, *Discus Delight* is a special diet containing Turkey Heart instead of Beef; add natural vitamins, stabilised vitamin C, and natural pigments such as Canthaxanthin and Astaxanthin (from Brine Shrimp extract) and Chlorophyll, Phycocyanin and Beta Carotene from Spirulina Shrimp products (including Hatchers) were well to the fore as usual.

Details from: **Tropical Sea**, Suite 4, Horsehay House, Horsehay, Telford, Shropshire TF4 3PY. Tel: 01952 505052. Fax: 01952 597487.

The new **Arcadia** Fluorescent Lighting Control Unit continues the development of these units to incorporate the latest advances in technology. The new features are: a mains distribution block with three sockets to run other aquatic equipment; continental plugs fit directly into sockets; unit acts as a cable tidy.

Plug and socket has detachable lamp lead which enables lead to be detached for maintenance, replacement or extension. Other lampholder units can be connected to the system.

For more information contact: **Jemard Brods plc**, Cairo New Road, Croydon CR0 1XP. Tel: 0181 688 8222. Fax: 0181 681 3119.

**Underworld** have added a new water pump to their range. *Microjet* is designed for all sorts of applications — from indoor fountains to hydroponics. The pump body measures just 45x45x37mm. There are two models, the MC320 and the MC450; both are fitted with reducing outlets to determine the flowrate. The MC320 retails at just £15.75 and delivers up to 320lph whilst the MC450 is priced at £17.99 and has a maximum

flow of 450lph.

Further details from: **Underworld Products**, Units 1 & 2, Belton Road West, Loughborough, Leicestershire LE11 0TR. Tel: 01509 610310. Fax: 01509 610304.

**Batsford Products** added another model to their Simlstream range of glassfibre Streams and Waterfall units. The RE70 is the largest model offered to date measuring 84x102cm. The retail price is £55 inc VAT. Their aquarium Simlstone range now has a Grecian theme — *Six Column Facade*, *Side Columns*, *Corner Columns*, *Broken Columns*, *Temple Arch* and *Plinth* can all be used to good effect (especially when placed in front of another "Greek" external background, as seen on another stand). Now if only I could think of a Greek fish species to complete my underwater Acropolis!

Details from: **Batsford Products**, Brindley Close, Holly Lane Industrial Estate, Atherstone, Warwickshire CV9 2HA. Tel: 01827 713730. Fax: 01827 718679.

**Barons** are virtually unknown name in aquarium publishing, although a very big name in the publishing world in general. I was surprised to find, when perusing their educational series, to find that they publish a number of titles on aquaria and herpetology. The layout and photographs are of high quality and the text is very informative. A first class series which should be more widely known.

Further details from: **D. Services**, 6 Euston Street, Freemans Common, Leicester LE2 7SS. Tel: 0116 2547671. Fax: 0116 2544670.

**Star Fisheries** are the first coldwater fish importer to have the confidence to guarantee their fish to be free from infectious ulcer disease. To this end they have identified their fish with the name *NorChin* which reflects their country of origin in North China, an area so far free of the worst fish diseases such as SVC (Spring Viraemia of Carp), VHS (Viral Haemorrhagic Septicaemia) and IHN (Infectious Haematopoietic Necrosis).

Details of stockists from: **Star Fisheries**, 94a Benhill Road, Sutton, Surrey SM1 3RX. Tel: 0181 643 8162/3/4/5.

**Greenways Environmental Care** have launched *Vivelle Pure Magic 2*. This synthetic



**Bio-Plast** continuously come up with new ideas and their stand provided a variation on the CO<sub>2</sub> injection theme. A relatively small plastic diffusion unit is immersed in the water and a tablet dropped in every day supplies CO<sub>2</sub>.

for the next 24 hour period. This makes for really low cost CO<sub>2</sub> injection (the unit will cost around £6.00) and the tablets are around £3.50 per phial. There are three types of tablet — all supply CO<sub>2</sub> but also (depending on type) add Fe, Phosphorus and Potassium; so for around £10.00 per three months (there are 20 tablets in each phial) your aquarium can enjoy luxuriant plant growth.

Details from: **Bio-Plast**, Unit 1, Old Goods Railway Yard, Kildwick Crossing, Cross Hills, Keighley, West Yorkshire BD20 7DA. Tel: 01535 630230. Fax: 01535 633690.



TOP OF PAGE CO<sub>2</sub> and Fertiliser Tablet System.

ABOVE CO<sub>2</sub> system (detail).

material developed by ICI is a bacteriological filter material made from acrylic fibres. It is claimed to remove multicellular free-swimming algae from aquatic systems. It can be rinsed and re-used and may be used with *Vivelle Pure Magic 1* as a pre-filter. The latter removes even unicellular algae, but has a shorter working life. *Pure Magic 1* is supplied in 3in thick sheets measuring 17x11in. *Pure Magic 2* is the same thickness, but comes in larger sheets measuring 20x16in.

Further information from: **Greenways Environment Care**, Southend Farm, Long Reach, Ockham, Surrey GU23 6PF. Tel: 01483 281391. Fax: 01183 281392.

Incidentally, that **Best Aquatic Product Award** went to (and I know I'm a plant person but ...) *Silkies Water Lilies* from **Cyprio!**

Details from: **Cyprio Ltd.**, Hards Road, Fagnall, Deeping St James, Peterborough PE6 8RR. Tel: 01778 344502. Fax: 01778 348093.

Joining the ranks of the anti-

green water brigade, a most relevant item at this time of year is the *Environmental Green Water Treatment* which forms but one part of the "Pond Doctor" range of treatments from **TAP**.

Ten ml of the treatment should be added to every 40 gallons (180 litres) of pond water. This is best done by mixing the correct dosage with a gallon of water in a watering can and then sprinkling over the entire pond. After one two hours the algae will either float or sink in clumps; these should be netted or siphoned out or may be left to biodegrade. The instructions are extremely clear and give good advice.

Other products in the range include: *Biofeed Plant Food*, *Pond Safe Clean Water Treatment*, *Dechlorinator Water Conditioner*, *Algae Blanketweed Treatment*, *Pond Tonic Health Booster*, *Anti-Bacteria Pond Treatment*, *Anti-Fungus Pond Treatment*, *Anti-Parasite Pond Treatment*. A seven-day helpline is available on 0117 969 2345 for product

Continued overleaf ▶



# BUY LINES

advice and assistance.

A new range of Pond Doctor foods include Floating Foodsticks, Staple, Growth and Wheatgerm Pellets and Flake Mix. The foods are available in uv-protected acrylic jars and come in four sizes.

Full details from: Technical Aquatic Products, 64/65 Anthea Road, Fishponds Trading Estate, Fishponds, Bristol BS5 7EX. Tel: 0117 958 5588. Fax: 0117 958 5577.

**NOTE:** Would all manufacturers and distributors who would like to submit samples and text regarding their products for inclusion in Buy Lines please send them directly to myself at the address below. This will cut down the processing time and get your product details into print that much faster! Wherever possible 35mm transparencies should be included but good quality coloured prints will suffice. Mr Barry R. James, Everglades, Baurton, nr Cirencester, Gloucestershire GL7 7BB. Tel/Fax: 01285 654656.

The **Wardley Corporation of America** have been established in the British marketplace for 30 years or more and I have always admired the quality of their products and the excellence of their packaging. Their new range of Pelleted Foods and Algae Discs are packed in stand-up plastic pouches, a style popular with



some well known Japanese manufacturers. The art work is spectacular but tasteful and the contents contain a full spectrum of nutritious ingredients.

Further details from: Rosewood Pet Products Ltd, 45 Coalport Road, Broseley, Shropshire TF12 5AN. Tel: 01952 883408. Fax: 01952 884359.

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## INTERPET Pond Workers™ Competition Results

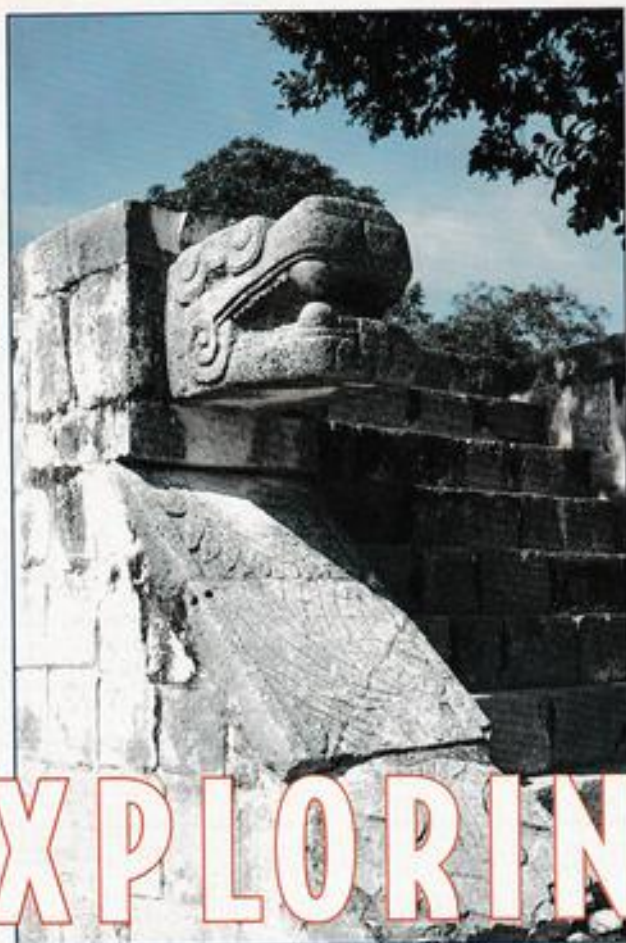
A&P has pleasure in announcing the result of the INTERPET Pond Workers™ Competition (April Issue). The first three drawn from the postbag win one of Interpet's revolutionary Pond Workers™. The lucky winners were: D. FARQUHARSON, EDINBURGH; M. TAYLOR, FINCHAMSTEAD, BERKS; MRS T. DIXON, GRANGE-OVER-SANDS, CUMBRIA.

Also, 10 runners-up receive Master Pond Check Test Kits. They were: A. SIMPSON, GRIMSBY, LINGS; M. GILBANK, ACOMB, YORK; MRS G. PERRY, ORPINGTON, KENT;

MR CARL MORRISON, EGREMONT, CUMBRIA; M. J. JEWELL, POOLE, DORSET; C. CLIFTON, HAXEY, DONCASTER; B. MARSH, SHIRLEY, CROYDON; G. THOMPSON, SLOUGH, BUCKS; J. MACARTNEY, CARRICKFERGUS; G. MATHERS, LEEDS, W. YORKSHIRE.

Our congratulations go to the winners, who will receive their prizes from Interpet as soon as possible.





# EXPLORING THE YUCATAN

**M**exico's Yucatan Peninsula extends northward from Central America toward Florida, its northern rim extending into the Florida Straits, its western shore facing the Gulf of Mexico, and its eastern coast washed by the Atlantic Ocean. Within the heavily overgrown interior, low impenetrable jungle grips the shallow, limestone-based soil, sucking out the great amounts of rainfall that have yet failed to seep down through the fractures into the limestone Swiss cheese-like rock below. No surface waters exist in most of this vast jungle, yet here and there magnificent ruins of Mayan cities dating

## BOB GOLDSTEIN GOES DOWN MEXICO WAY WITH FISH ON HIS MIND.

• PHOTOGRAPHS BY THE AUTHOR •

from the 4th century A.D. poke their great temple tops above the low jungle. How did these people survive without surface water? They relied on the vast

stores of ground water stored in the rock below, here and there accessible through man-made or natural sinkholes, called cenotes (SEN-OH-TAYS).

Fishes live in these cenotes and the rock channels permeating the caverns and channels below. The best known are one species of catfish and one cichlid, of no particular interest to aquarists due to their large size and uninteresting colour patterns; they were of little interest to me, because I could not catch fish 50ft down a vertical wall in the jungle, and there was no chance even to locate young of the large and rather ugly *Cichlasoma urophthalmus*.

It was the fishes of the edges of the



Yucatan that interested me most, for starting with my first trip there more than 25 years ago. I was faced with a literature that insisted the Yucatan had no fishes of interest to aquarists. That turned out not to be true. What transpired, beginning with that first trip of many, was the finding of several fishes not previously known to occur there, and of particular interest to the hobby.

## LIVEBEARERS

The livebearers are species poor, but numbers rich in Yucatan. All the coastal waters are filled with the Yucatan Sailfin Molly, *Poecilia (Molliesia) wilfina*. Despite the awe in which these fish have been held ever since William T. Innes described them in the aquarium literature, they are virtually indistinguishable from Sailfin Mollies of the coast of the United States. *Poecilia (Molliesia) latipinna*. Not only is the fish over-rated in hobby literature, but specimens seldom are as well developed as our more familiar species, and they are almost impossible to disperse among even the most acquisitive specialists in the Poeciliidae. I have not found melanistic specimens either, further diminishing this fish's potential to the hobby.

But I've been wrong before, seldom as wrong as I was when I concluded that the local Yucatan Mosquitofish, *Gambusia yucatanae*, also was of no hobby interest. As you'll see from the

difficult to sustain in the face of our failure to find melanistic females or produce them through back-crosses of melanistic male offspring to their mothers.

*Gambusia yucatanae* is different. Just a couple of years ago, Dr. Sallie Boggs located melanistic males and females in a pool near the town of Cancun, on the Atlantic coast of Yucatan. These were not merely melanistic, but a combination of melanistic and yellow, both males and females. She brought them back, and they are now in my fish room, offspring available to selected aquarists in whom I have confidence.

That the females also have melanistic pigment might be explained by the presence of black dots in the wild type of both sexes, indicating melanism genes in both sexes with which to work. (Perhaps there is no such gene in females of *G. kribbrooki* of the United States.) That the fish has both black and yellow is not at all difficult to fathom, when one recognizes that yellow pigment is an intermediate product in the biochemical pathway to melanin (black pigment). It is, however, delightful that this fish is decorated with both pigment products of the same pathway, and it is hoped this fish will enjoy a future in the hobby.

## KILLIFISHES

The second group of fishes is the Killies (*Cyprinodontidae*). On my first trip, I

located *Favonulus grandisimus*, an enormous giant version of the Mummichog, *F. heteroclitus*, of the Atlantic coast and its sibling species, the Gulf Killifish, *F. grandis* of the northern coast of the Gulf of Mexico. A very pretty fish, it is restricted to low salinity brackish water (but capable of living in fresh water), but too large, at eight inches, to be of interest to Killifish aficionados.

Of great interest, on the other hand, was the fish at that time known from pickled material as *Gambusia pulchra*. I located them in a fresh water ditch near on the island of Cozumel, off the coast of Yucatan, on my first trip. A lovely fish in orange-golds and silvery green, it had never been seen alive by its describer, the late, great ichthyologist, Dr. George S. Myers of Stanford University in California. When the opportunity arose, and Dr. Myers was in Atlanta, Georgia for a professional meeting, I brought him to my home to see this fish alive. On his hands and knees, peering into a tank on the lower rack of the stand, he was enthralled to see the lovely living fish of a species he had described in the scientific literature, but never seen alive.

I've since found the fish, now known as the Yucatan Flagfish, *Jordanella pulchra*, everywhere in the Yucatan where fresh water ditches and rainwater or groundwater ponds are at ground level and filled with lush vegetation. It is an aggressive plant spawner, laying small eggs in floating mops in aquaria, but neither prolific nor easy to keep. The fish is very aggressive, to its own kind as well as other fish, and successful propagation is difficult.

There is a Pupfish here, widespread all along the mainland low salinity marshes and on the islands, that is virtually identical to the Sheepshead Pupfish, *Cyprinodon variegatus*, of the eastern and Gulf coast of the United States. Most people consider it a subspecies of *C. variegatus* (*C. v. antiferus*), but there has been speculation that it is a separate



**ABOVE**  
Female Yucatan  
*Gambusia*, *Gambusia*  
*yucatanae*.

photograph, there are some specimens magnificent in their coloration. In the southeastern United States, the Eastern Mosquitofish, *Gambusia kribbrooki*, has populations, particularly near the coast, in which there is a high frequency of melanistic males (perhaps one in a thousand fish). That has always been of some interest to the hobby, an interest

**RIGHT**  
Pupfish from  
Yucatan, *Cyprinodon*  
*variegatus*.





## TROPICAL

### Exploring the Yucatan

species (*C. artifrons*), a view to which I do not subscribe. What makes this fish so interesting is that, when placed in full strength sea water, the males become almost black with yellow tails, a colour change I have not seen in the Sheephead Pupfish. Otherwise, it is just like its US relative, easy to breed in brackish water (or marine) with spawning mops.

One other fat type of Killifish (Pupfish type) occurs throughout the Yucatan's coastal waters, and that is the large and vicious Yucatan Goldspotted Killifish, *Floridichthys polyommata*. Like its only relative in Florida, it exists in huge schools in very hot water in hypersaline mangrove flats. Why it was never found

numbers of total fish in the area.

In aquaria, *Floridichthys polyommata* get along among themselves as long as all fish are about the same size (as in nature), but they are fin-nippers. Spawning of the small eggs in floating or sunken mops begins at about three fourths of an inch in length, and continues into full adulthood, when the fish is over 2in long. I keep mine in full strength sea water, but they tolerate 50% sea water without difficulty. Although the colours can be photographed with sunlight or a strobe light in captivity, I have never seen a captive male to match the coloration of a wild supermale.

If I can make a claim to fame about Yucatan fishes, it was through my

that each egg laid (in spawning mops in captivity) by any individual is already fertilized. What this means is that, in nature, there is no minimum population size necessary to sustain the species. As long as one individual exists, the species will survive. So-called males have been found rarely in nature, and can be produced in the laboratory by exposing early stage fertilized eggs to cold (in the 50s). Surviving offspring sometimes develop into lovely orange fish with testes but no ovarian tissue. However, such fish play no role in nature, as never is an egg produced that is not already fertilized by its parental fish.

Now I have found another *Rivulus* in Yucatan, and I have no idea what it is. This fish is clearly a male, and clearly not a cold-induced male of *R. marmoratus*. It is elongate (completely different shape from *R. marmoratus*), iridescent blue on a brownish body, with red dots concentrated along the lower flank. I collected just one specimen on a trip with Dr Sallie Boggs, and despite our best efforts we were unable to find a female or another specimen at all. Sallie even went back the following year to the same site, but was unable to find a second specimen. I did get photographs before the fish perished, and sent an enlargement to Dr Jamie Thomerson of Southern Illinois University, who will compare it to other species of *Rivulus* known from farther south along the coast of Central America. Perhaps this will be northward range extension of a known species; perhaps it will be a new species. Aquarists visiting Yucatan are advised that it occurs in fresh water together with *Jordanilla pulchra* in heavy vegetation, and I suspect it dives into the mud and silt to hide once collecting is initiated. Collectors will have to get them on the first swipe with the net, or dig up the mud and go through it looking for this fish.



Yucatan Goldspotted Killifish, *Floridichthys polyommata*.

with other fishes became clear when I got some back alive, and found them to be extremely vicious, biting the fins of each other as well as tearing away the fins of other fishes. On occasion in nature, one finds what I call a supermale, a fish with such intense and lovely coloration, that it appears to be the dominant male in a school of perhaps a hundred to five hundred fish. Surely it is not the only fish spawning (Killies are unstoppable!), but it may protect its herd from other supermales defending their schools, and thus help to close off the genetic variability of its small population. If this is true, then the diversity of the gene pool of this fish is based on small groups, not on simple

finding, on Cozumel, of *Rivulus marmoratus*, at that time not known to occur in Mexico. For those not familiar with this fish, there is both good news and bad news. The bad news is that this fish takes first prize for ugly. It is grey, with a black 'rivulus' spot at the base of the tail. That's it. Both males and females? Now we get to the good news. *Rivulus marmoratus* is the only vertebrate known that is a synchronous hermaphrodite, the species not consisting of males and females but of combined-sex individuals. Each individual (and they look like females of other species of *Rivulus*) has an ovotestis, gonadal tissue that produces both eggs and sperm. All the more remarkable is

### DON'T TELL ANYONE, BUT ...

The Atlantic coast of Yucatan (but not its northern or western coasts) is lovely for skin-diving and snorkelling, and I collected and brought back a number of Butterflyfish and Angelfish caught with a dip net. As this is not exactly consistent with all of the laws of Mexico, I don't advise you doing the same! I'll talk about collecting and transporting small marine fishes in another story.



# I counted them in ... and I counted them out

No, I didn't exactly know what it meant either (well, to confess, I did think it was another name for a wholesaler!) so I thought it was time to find out.

Obviously, with more fish than passengers arriving on flights from exotic places, the livestock have to go somewhere before they reach their final destination in our aquariums and the usually-surmised sequence of events is wholesaler-retailer-customer. However, sometimes the journey is interrupted — say for a flight change — and this is where the consolidator comes in, as a very important staging post on the trans-shipment way. The biggest difference between what a consolidator does and what I thought was done, is that fish spend very little time on the premises. There are no facilities (nor time nor need) for lengthy quarantining, which is done at the final destination. However, this intermediate stop is used to carry out a very useful check on the wellbeing of fishes in transit.

Richard Chang, of Ornamental Fish

## With acknowledgements to a certain Falklands War Correspondent, *The Editor* takes a look at Consolidation.

Consolidators, kindly invited **A&P** to see how things operate at his premises only a mile or so away from London's Heathrow airport.

First, Richard filled me in on his own involvement in fishkeeping — from way back in 1978 in Singapore and from 1982 in the present Company. Then to the two fish-holding areas — the one for coldwater shared its room space with enormous replacement-water holding reservoirs, the other had a well-insulated door, and 300 tanks for tropicals (split into separate banks for African, South American) plus a whole row of water-filled, but otherwise empty tanks, to act as an emergency holding system for stock delayed for any reason between arrival and departure at Heathrow. So far so good; then, as if someone had lit the blue touch-paper beneath him, Richard leapt into action! "Come on!" he cried, "a shipment's coming in and I've just got enough time to check it over before it has to be back at the airport for the next flight to Newcastle."

Hardly had he set the scene when a small van arrived and fish boxes were rapidly stacked in respective customer's piles within the checking department. I tell you, you don't want to be around Richard when he's armed with a Stanley Knife and facing a deadline! Open came the boxes, the fish were checked — "These could do with a little more water, those I'll give a burst of oxygen to; quick! Where are those heating capsules?" All this action punctuated by the rasping sound of sticky tape being ripped off and new re-applied. Almost as though it had never happened, the boxes were back in the van and on their way back to the awaiting plane.

Life returned from its apparent double-speed playback to something near normal — "Now," said Richard "where shall we go for lunch?"

Over a much more leisurely-taken meal, I had to marvel at what I had seen; yes, water and oxygen had been added where necessary; the now melted ice-packs (put in at source) in the boxes of marines had been removed and heating capsules put in (remember this was England in March, with ambient temperatures to match); delivery documents double-checked and all important paperwork re-assigned to each case. All done with the utmost speed but with the utmost care — I doubt if the fish ever knew (apart from a flash of daylight) that they had been checked over.

So, the next time you like the look of any new arrival at your dealer's just remember that it was someone like Richard Chang, somewhere along the line that helped get them there in the fastest time possible and, more importantly, in the best possible condition.



TOP LEFT  
Here come the fish!

LEFT  
A quick puff of welcome oxygen.

TOP RIGHT  
Note the heating capsule taped to the lid of this marine box.

RIGHT  
Back to the plane!



## Books



# Reviews

**Cichlids from West Africa**  
Author: **Horst Linke and Dr Wolfgang Staack**  
Publisher: **Tetra Press**  
ISBN: **1-56465-166-5**  
Price: **£14.95**

Cichlids from West Africa has been translated and updated from the German version and is finally available in English from Tetra Press. This 200 page handbook for the identification, care and breeding of West African Cichlids is packed with colour photographs of cichlids found in the many water ways between the Rivers Senegal to the Congo. Short chapters are devoted to cichlids in general and to setting up an aquarium, while the rest of the book gives valuable information on 96 species of cichlids in 10 genera — *Anomalochromis*, *Chromidotilapia*, *Hemichromis*, *Nanochromis*, *Parasnanochromis*, *Pelvicachromis*, *Staeocranus*, *Teleogramma*, *Thysochromis* and *Tilapia*.

There are photographs of almost every cichlid, and often both male and female fish. Description of the cichlids are geared towards distinguishing the cichlids from other species within the genus, since there are many colour morphs within some genera. The natural habitat of each species is described in some detail and includes water hardness, pH and temperature, as well as other fish inhabitants and plants as well, while distribution is shown on a map. The section on Care suggests suitably-sized aquaria, water conditions, other fish companions and plants. The Breeding section gives inside information on courtship, egg laying and fry care. The beloved *Pelvicachromis pulcher* (the common 'Krib') is of course covered in some detail, but this book is a real education as it awakens one to all the beautiful cichlids available from West Africa. This beautiful book has hit the market at just the right time, as many of these West African cichlids are becoming available in the UK. Both Linke and Staack have actually been out in the field time and time again, collecting these West African cichlids and discovering many new species and colour morphs, which is reflected in the book by the many anecdotes.

This book is a wealth of information for its modest price and is a must for every cichlid fancier.

**DR IGGY TAVARES**

### Looking after Freshwater Aquarium Fish

Author: **David Alderton**  
Publisher: **Blandford**  
ISBN: **0-7137-2580-X**  
Price: **£8.99**

Well-known for his regular animal articles in the popular life-style magazines, David Alderton turns his attention to the well-being of aquarium fishes in a very presentable softback volume of some 112 pages.

True to the main title, the major part of the work is indeed given over to the 'looking after' side of things with subjects such as Tanks & Equipment, Setting Up the Tank, Maintenance, Breeding and Diseases all being described before suitable fish are discussed for inclusion in the furnished tank.

Fish are described under three main headings — Coldwater Fish, Livebearing Tropicals, Egg-laying Tropicals. The coldwater section includes Sticklebacks, Sunfishes, Goldfish and White Cloud Mountain Minnows. Livebearers are represented by Guppies, Mollies, Swordtails, Platies, Mosquito Fish and Halfbeaks. Similarly, the egg-layers comprise the most popular groups — Killifish, Barbs, Rasboras, Danios, Tetras and other Characins, Cichlids, Labyrinthfish, Catfish and miscellaneous species. Obviously in a book of limited proportions no one Family can be covered in any depth (for instance, Rift Valley Cichlids are only mentioned in passing) but throughout the book there are often snippets of information to be picked up in associated captions to fish illustrations. Speaking of which, the illustrative material is a pleasant blend of both colour photographs and line drawings, the latter reserved mainly for equipment, plants, maps and anatomical detail.

For the newcomer to the hobby, this book will sit nicely on the bookshelf, giving good advice in an uncomplicated way

and providing a confidence booster for those often difficult early times; at the same time it also gives some idea of the whole range of the attractions of fishkeeping which will act as a spur to greater things.

**DICK MILLS**



**The Completely Illustrated Guide to Koi for Your Pond**  
Author: **Dr Herbert R. Axelrod et al**

Publisher: **TFH Publications**  
ISBN: **0-7938 0597-X**  
Price: **£39.95**

Without exception, all Koi books are beautiful due mainly of course to the subject matter. But not all Koi books are informative nor overwhelmingly interesting, being nothing more than a collection of colour plates and destined for coffee table-top decoration purposes rather than the shelves of practical fishkeepers. However, this book manages to embrace all the pre-mentioned positive properties — beautiful, informative, overwhelming interesting and most certainly extremely decorative. So how come it's different?

The credit must go to Herbert Axelrod for divining what makes a good book (and, let's face it, he's had plenty of practice at it!). He spotted that there was a gap to be filled between the 'picture book' of Koi species approach, the 'how to' books and the increasing current situation of not everything Koi being Japanese. He therefore set about producing what can only be described as a book about 'world Koi.' He added to this precept another facet, an immense depth of history and tradition of Koi-keeping.

The book provides a complete guide to Koi from every conceivable angle: there is the question of just what is a Koi? How do the Japanese judges evaluate the thousands of fish they see each year? (Some Judges' comments make excellent reading.) There are Koi ponds and there are Koi ponds but nowhere are any judgements made to make

small ponds seem inferior to larger ones. Filtration systems are explained with a clarity probably only surpassed by that of the water returning from some of the more complex systems. Pond plants, pond-visiting animals and birds are described (and warned against where necessary); suitable pond fish are listed and include basic Koi varieties. But then the book turns to Koi proper.

Entitled 'The Face of the Kohaku' the next 90 pages or so are simply filled with varieties of Koi ranging from the classic to the synthetic — if you think colour-injected tropical fish are bad enough, wait 'til you see the 'Sweetheart' Koi with transplanted heart-shaped scales!

Concluding the 'culturing of Koi' section of the book, a chapter 'Methods for improvement of Japanese ornamental (Koi) Carp' sheds much light on the development of Koi outside of Japan, especially in Israel. Apart from the sheer amount of day-to-day effort being expended on Koi culture there is much 'cutting edge of technology' going on too with Koi being cloned (a process most people can conceive) and processes of gynogenesis that we can only wonder at. The problems of acceptance by Japanese Koi devotees of long-finned Koi is a battle whose peacefully-negotiated we must await with interest.

However, the Koi's ancestor, the Common Carp is not forgotten nor left behind. Its place in history is fully documented as a food fish, especially in medieval Europe; the success and spread of the Roman Empire may well have been founded on the number of Danube carp available for food! An interesting chapter also compares the domestication of the Carp with that of other food animals — including the rabbit.

So you can see, there's more to Koi than what you see from any pond bridge or bank. I found one saddening thing in this book: one small line of information on the dedication page announced that this was to be the last Herbert Axelrod Koi book; having seen the wealth of information, marvelled at the depth of research and the quality of the presentation, I can well believe that HRA cannot better this creation and I think he would be reluctant even to try.

**DICK MILLS**



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# "MERLIN"

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## CD Rom



The Fish of Mamirau — Volumes 1-4  
Compiled by: Peter Henderson and William Crampton of the ABRG, Dept of Zoology, University of Oxford, Oxford, OX1 3PS, England, and Projeto Mamirau, Tefe, Brazil  
Price: £25.00 per disk,  
£80.00 per set of four

The Amazon basin holds the world's most diverse freshwater fish fauna (recently estimated at approximately 3,200 species) yet there is little knowledge about how this great assemblage is organised into communities and how water chemistry influences fish populations. The forest and its waters are becoming ever more damaged by human activity and there is a pressing need to understand factors that generate and maintain this diversity. This study was initiated to obtain aquatic diversity and fish biomass data for the Reserva Mamirau management plan. Projeto Mamirau aims to create a reserve of the Rios Solimés and Japur floodplain that will enhance fish populations. In this region people get more than 80 per cent of their protein requirements from fish. Unfortunately, there are now clear recent indications of over-exploitation of some fish species but there are presently no published accounts of the fish fauna of this floodplain.

This series of four CD ROMs, produced to increase knowledge and awareness of the fish fauna of the Amazon, presents photographs and background information on all the species of fish caught within the Mamirau Ecological Station and surrounding waters. The Mamirau Ecological Station is Brazil's largest conservation unit situated in an area of swamp forests in the state of Amazonas, between the Japur, Solimés and Auaí-Paraná rivers.

The images are supplied in the Kodak photo-CD format and are of full photographic quality. They can be viewed using standard image viewing or editing software on an IBM or Apple-Macintosh personal computer. The discs also hold text files which give you the name of the fish in each picture, its MVC accession number, details of specimen within the MVC, the name of the photographer, further details about the photograph and the local name, a recent paper about the fish fauna of the region and a full species list for the reserve. Obviously Cichlids, Characins and Catfish play major parts in the 'cast list' of around 400 fishes but other species not belonging to these predominant Families are also featured.

Like many field studies, for practicable reasons, it presents most of the species as preserved, or recently-caught, specimens with the latter mainly shown laying posed on a human hand. However, for the conservation-minded, the pictorial information together with location details and water quality parameters will do much to 'open up' knowledge of the area's rich aquatic fauna which, we sincerely hope, can be preserved for the benefit of all.

Purchasers of these CD ROMs will gain comfort in knowing that they are making a contribution to the establishment of the Mamirau Ecological Station and helping to conserve the fish of the Amazon.

Animal Behaviour Research Group, Dept of Zoology, University of Oxford, South Parks Road, Oxford OX1 3PS.



# TECHNICALITIES for beginners

## Fluidised Bed Filtration — A New Era

PETER MOON reports that an efficient biological filter is the "heart" of all aquariums and until recently this was achieved by the use of undergravel filters and/or canister filters, but now there is a new "kid on the block", as far as hobbyists are concerned — the Fluidised Bed Biological Filter.



### In the beginning

These filters have been in aquaculture for the past fifteen years or so, albeit large towers of six feet plus operating large commercial displays and fish holding facilities, also they are used in municipal water supply operations, but only in the past eighteen months or so, have they been available to the home aquarist.

### The filter

A fluidised bed filter is basically a cylinder or a box that contains a media of fine

silica type sand that incorporates a porous surface area for bacteria to grow and thrive, but that's not all. The media has to be kept in suspension and the flow through the media has to be controlled for the "dwell time" to operate effectively and also to alleviate the possibility of the media settling. The best advice here is to run the filter in conjunction with a water pump that incorporates a variable flow control or use a tap on the outlet to adjust the flow accordingly. The media used can provide up to 65 square feet of surface area per pound with average size filters holding between one-two pounds of media. That's a lot of surface area for a small filter!!!

### In operation

Aquarium water is pumped into the unit, preferably with a water pump incorporating a foam block to act as a pre-filter and the flow is adjusted accordingly (too powerful a flow could blow the media out of the unit, so adjust slowly) to "Suspend the Bed". The media will begin to turn a light brown colour as the bacteria begin to colonize and due to the irregular shape of the sand particles the bacteria cannot be easily rubbed off as the sand undulates in the column, however because of this constant movement the older bacteria (less efficient) are being replaced by younger more efficient ammonia/nitrite

converters, so the process keeps moving on and as the filter matures, zones will develop ie light and dark brown areas with the dark segments being the older bacteria.

As mentioned earlier, the flow through the filter is relatively slow, simply because the medium needs to float as opposed to water being forced through or over it, therefore the "dwell time" is longer and this can produce well over 90% plus conversion of ammonia to nitrite in a single pass!!

The main advantage of these filters is that "dead spots" and "channelling" are virtually non-existent, also mounting configurations are varied and larger models can be run in-line with external power filters. In several American magazines these filters can be seen hanging on the side or back of trickle filters to enhance the filtration further.

### To conclude

If you are considering setting up an aquarium for the first



PHOTO: ASP LIBRARY

time or requiring extra biological filtration, then certainly consider a Fluidised Bed Filter, they are suitable for all kinds of systems from reef tanks to garden ponds; their compact design, silent operation and, more importantly, ease of maintenance, gives these filters the edge over conventional biological filtration.

Next month we will take a look at algae (the undesirable kind) so, until then, Happy Fishkeeping.



# ... News Desk ... News Desk ...

## National SeaLife Centre

It seems the telephone number we gave in Newsdesk (A&P April) managed to connect readers with an insurance company (no, we haven't got a commission arrangement with them!). For information please contact National SeaLife Centre, Water's Edge, Brindleyplace, Birmingham B1 2HL. Tel: 0121 643 67777.

## Pachypanchax species at Bolton

Tim Henshaw and Peter Liprot, the staff at Bolton Museum Aquarium are committed to breeding some of the fish species that are recognised as being close to extinction.

Because of the water quality at Bolton we are looking specifically at soft water fish and fish that will tolerate a variety of water conditions. One area that appears to be suitable is Madagascar, here most of the native fishes are under threat from the introduction of foreign species and deforestation/industry.

We have been breeding the Madagascar Rainbow Fish *Bedotia gasyi* for six years plus now. So we feel our conditions must be suitable. The only problem was where to get suitable stock.

Fish brought in through the aquatic trade are healthy enough, however, their history is often difficult to establish as well as where they were first collected from. This is very important for any breeding programme if the fish were ever to be returned we need to make sure what is put back in what was taken in the first place.

With this in mind we approached Jersey Wildlife Preservation Trust who do a lot of work with vertebrates from Madagascar. Unfortunately, they do not work with fish, however they were able to give us the name of someone who does work with the Malagasy (from Madagascar) fish.

## Aquarists help the Zoos

All the leading UK Zoo curators attended a conference at Chester Zoo on 25 and 26 April to listen to short papers on Aquatic Animal Management. Titled 'New Horizons' a committee from Chester, London, Dudley and Glasgow Zoos arranged the conference with the mission to "bring together all parties with an interest in the management of aquatic animals and to discuss key aspects of aquatic animal management for fish, invertebrates, amphibians, reptiles, birds and mammals".

There were no less than 32 papers presented over the two days ranging from 'Breeding Moon Jellyfish' to 'Sea Turtle Rescue'. The main papers however were from aquarists such as Dr David Ford (Aquarian), Dr Alistair Macartney (Waltham), Dr Peter Burgess (University of Plymouth) and Dr Jeremy Lee (Intensive Aquaculture Technology Ltd) who described aquarists' methods of husbandry.

Many aquatic animal managers use sterile systems for housing captive animals such as penguins, dolphins and seals. The water is filtered clear with pressure sand filters and kept sterile with added chlorine ... a system quite unsuitable for fish. If the dechlorinated, mature water used by aquarists is supplied, maintained by biological rather than chemical filtration, it was recognised that the aquatic animals would be healthier and happier.

Sixty nine zoo staff attended representing all the UK Zoos and Public Aquaria plus Aquariums in Elre, France and the Netherlands. As Chester Zoo Director Dr Gordon Reid stated at the end of the two days: "This meeting has been a success not only from the wide ranging topics presented but in the informal discussions of experts with one common interest, the welfare of aquatic animals."



Dr David Pool of Tetra introduces a question and answer session at Chester Zoo's Lecture Theatre. Left to right are Dr Alistair Macartney (Waltham Aquacentre), Dr David Fletcher (University of Wales) and Andrew Greenwood (International Zoo Veterinary Group).

PHOTO: DAVID REID

This turned out to be Dr Paul V. Loiselle. Upon initial contact with Dr Loiselle, he informed us of the current state of some of the Malagasy fish. To put it mildly it was quite alarming. However, he was having another collecting trip in 1995 and that would throw more light onto the current situation.

On a previous trip to Madagascar he had collected

*Pachypanchax omalonotus* and *Pachypanchax sakaramyi* available. He had large numbers of *P. sakaramyi* and *P. omalonotis*. He would be willing to start cultures of both species, providing we paid the freight costs.

This was agreed and because we have contacts at Virgin Atlantic Airways we were able to have the fish flown over to

Britain free of charge.

After sending a few faxes between New York and Bolton, the fish were destined to arrive in Britain on Thursday 22 February 1996 — to Heathrow. Being a Council funded/run aquarium we looked for the cheapest and most efficient method of getting the fish back. This was actually using British Rail.

Everything worked out beautifully up to the return journey when BR had a series of "hiccups" which delayed the train by 85 minutes. However, the fish arrived at Bolton in due course all alive and in good condition. They were treated with kid gloves, given two hours to stabilise the temperatures and two hours of careful mixing of the waters.

Twenty-four fish of each species arrived. They were housed in two tanks per species, 12 fish in each tank. Because there was no difference in conductivity of the New York water to the Bolton water we put salt in one tank and left the other in our tap water (matured).

Within an hour of release all the fish were gorging themselves on brine shrimp and wingless fruitflies. The males are quickly colouring up and are truly attractive fish.

Although none of the books mentioned whether *P. omalonotus* and *P. sakaramyi* are jumpers Baensch's book 'Aquarium Atlas' states *P. playfairi* are very good jumpers, we therefore decided to take no chances and covered the tanks.

What we have noticed so far is that both species will accept flake food, brine shrimp and fruitflies. Of the two species *P. sakaramyi* is the more nervous, but this may be due to their tanks being bare.

We are hoping to see the males driving the females shortly. We will keep you informed of our progress.

## Grocklemania winner — eventually!

We had a very healthy response to the competition for

Continued on page 124 ►



# ... News Desk ... News Desk

◀ Continued from page 122

tickets for this exciting weekend but nothing prepared us for the excitement of selecting the winner!

The names of all the correct entries were duly put into the 'hat' and against all the odds (or justifying Murphy's Law once again) an entry from far away

Orkney emerged. A telephone call confirmed that the entry was genuinely made but circumstances prevented the winner from making the trip. Out came the 'first reserve' and a delighted reader's wife in Romford was overjoyed to receive the news — until husband came home to remind her that a rearranged family

wedding was due on the same day!

By now it seemed that everything was against us but this time (confirming another well-known Law — Third Time Lucky) the winner drawn from the diminishing pile turned out to be both grateful and able to make the event. (As she lives in Southampton we even

considered threatening to go over from the Isle of Wight and drag her back to ensure she got there!)

So, play the fanfare for the third time! The winner of A&P's Grocklemania Weekend Competition was Mrs B. A. Bennett of Southampton. A full report on the Weekend will appear in a future issue of A&P.



## How to install a pump in your garden pond

If you're planning to build a pond in your garden or you're thinking of turning an existing pond into a feature by adding an attractive fountain or waterfall, you'll need to install a pond pump. Installing a pond pump will increase the circulation of water and re-introduce oxygen, making the pond altogether more healthy for its occupants!

A submersible pump will offer you the ideal solution to installing an attractive water feature, will help keep your pond from stagnating and, because it's submersible, there's nothing to spoil the look of your pond.

### INSTALLING YOUR PUMP

- The pump you have chosen for the size of your pond should be sited near the bottom of the pond, slightly raised to prevent the strainer from pulling in debris from the pond floor. Simply place the pump on a brick or something similar to prevent it from blocking up.
- By mounting the pump near the bottom of the pond you will introduce a natural circulation of oxygenated water, drawing the water from near the bottom and pumping it up to the fountain or waterfall display which, in turn, introduces oxygen back into the water. This is especially useful during the warmer months when oxygen is taken out of the pond by the heat from the sun which can make pond life very lethargic.
- When installing a fountain, ideally the pump should be lowered in the centre of your pond; take care to hold it using the eye which is mounted in the centre of the pump body. Do not lower the pump by the cable as this could put a strain on the cable's retention components. However, if you are installing a waterfall, the pump should be lowered into the pond at the opposite end from the waterfall as this will encourage maximum circulation of the water in your pond. Plant water-lilies out of the main current or water wherever possible.
- The electric cable to the power source should always be run through a conduit, possibly buried in either a border or under the lawn, for protection. The free cable end should exit this conduit inside a building, at which point it can be hard-wired into a residual current circuit breaker — an absolute necessity for any electrical component of this type when being used in the garden environment. Stuart's range of Water Nymph pumps come with ten metres of cable, however, if additional length is required a cable of suitable quality for external use and an approved water-proof connector should be used.
- Stuart Turner's Water Nymph pumps, types 130 and 220, are pre-fitted with a 15mm push-fit fitting onto which a hose can be fitted. Alternatively, a "Tee" piece (available from Stuart Turner) can be

- fitted to run either fountain and waterfall or fountain only.
- The Water Nymph types 330 and 550 are fitted with a 1/2 inch BSP connection onto which a small hose union or hose fitting can be attached.
- As an alternative, the standard "Tee" fitting can be screwed straight onto the pump and the appropriate water feature fitted directly onto it.
- If a lot of piping is involved in the installation of your pump, always ensure the pipe is kept as large as possible. This will reduce the loss of water flow within the pipework and will help to maintain maximum performance from your pump. Sharp bends and "Tees" in the pipework can also reduce the pump's performance — so avoid too many of these and pre-plan your pipework carefully!
- After a period of time, a reduced performance in the pump may occur. This is due to the unpreventable problem of debris invading the filter which is fitted to the base of the pump! Simply remove the pump from the pond, clean the filter in tap water and re-submerge the pump into your pond.
- Your pump should be submersed at all times. This helps to cool the pump while it is operation and will give you the most attractive installation.

If you would like any more information about Stuart Turner's wide range of submersible pumps, surface pumps, power filters and other aquatic products, please contact your garden centre or stockist and they will be happy to help you.

To win a Stuart Turner Water Nymph 550 pump with a jet spray fountain feature, complete the following questions, by choosing a, b or c and send your answers to: Stuart Turner Competition, FREEPOST, The Clock Barn, Little Baldon, Oxford OX44 9BR.

The first five lucky winners to be drawn from the hat will win the Water Nymph 550 pump and Jet spray fountain feature. All entries must be received by 31st August 1996

### Q1. Why should you install a pond pump?

- (a) To turn the pond into a Jacuzzi for the fish.
- (b) To keep the cats away from the fish.
- (c) To introduce oxygen or create an attractive water feature.

### Q2. Why should a pump be submersed at all times?

- (a) To keep the pump cool.
- (b) To keep the pump wet.
- (c) To stop the birds from eating it.

### Q3. When installing a fountain, what is the ideal location for a pond pump?

- (a) Submersed at the edge of the pond.
- (b) Submersed at the centre of the pond.
- (c) At the centre of the pond on the surface.



# SOCIETY WORLD

## SOCIETY MEMBERS!

Get **A&P** each month, and save money in the process. Take advantage of this Very Special Offer made by MJ Publications Ltd., publishers of **A&P**. Societies can order **A&P** in bulk (12 copies or more) for their members at a Privilege Price of £1.50 per copy plus £4 postage. No more journeys to the newsagent, have **A&P** waiting for you each month at your Society meeting. Simply send in a cheque/P.O. for the required number of copies, plus postage, to: **A&P SOCIETY COPIES, MJ Publications Ltd., Caxton House, Wellesley Road, Ashford, Kent TN24 8ET, and we'll do the rest.**

## STOP PRESS Stop Thief!

To the person, or persons, unknown who on Monday 6 June STOLE the Koinobori from outside the Nishikigoi Centre at Hawkhurst Fish Farm:

We would like you to know that they were opening a present from our Japanese supplier and had been especially put on display for the May Bank Holiday Weekend. We, and all of our many visitors, are disgusted by your actions.

To anyone who knows, or provides knowledge of, their whereabouts, we are offering a £100 Reward.

Please contact Keith or Nicky on 01580 754030.

## Attention all Coldwater enthusiasts!

The Federation of Northern Aquarium Societies have also arranged, with the support and sponsorship of **A&P**, to run a separate Champion of Champions Contest for Coldwater Fish only. The final contest being held in Manchester each year at the British Aquarists Festival, where the first three winners will receive prizes similar to the

winners in the original contest. The contest will be judged to Nationwide Standards, which have been accepted by the Federation of Northern Aquarium Societies.

All societies, from all Federations and Associations, holding an Open Show can apply for an entry form, which will give the Winner of the Best Coldwater Fish at their Show, a unique and extremely smart Certificate (ready to frame), 12 months subscription to **A&P** and the chance to enter their winning fish at The British Aquarists Festival and the opportunity to win one of three very good prizes.

This is something new for the Coldwater enthusiasts and I hope all Secretaries will support the sponsors, and give their exhibitors the chance to enter. If you are not sure your Secretary knows of this new contest pass the word on, I would also ask each Society holding an Open Show, in their Open Show Schedule, to mention both C. of C. Contests, in with the list of awards to be won at their Show.

Hope to see all the Open Show Winners, and those interested in the coldwater side of our hobby, at The British Aquarists Festival in Manchester on the 26 and 27 October 1996.

Entry forms can be obtained from **Aquarist and Pondkeeper (Contest)** c/o A. Chadwick, 9

Bronville Close Chadderton Oldham OJ 2RH. If you have already held your Show by the time you read this, you may still apply for an entry form, so do not miss out.

## Great Greenock!

The GREENOCK and DISTRICT AQUARIST SOCIETY'S 11th Annual Open Show was a great success with over 400 entries from all over the country from as far afield as ABERDEEN, DUMFRIES, AYR, RUTHERGLEN and right down to WORKINGTON. There were some magnificent fish on display with 62 species and 38 special awards.

Congratulations to TOM YOUNG (Perth) Best Fish in Show, *Rasbora alpinis*; ALLAN JAMES (Greenock) second Best in Show, *Mochokiella paynei*; GAVIN COWAN (Solway) *P. myersi*; K. MARSHALL (Clyde) Best Pair, *Corydoras pygmaeus*; GRAHAM MACKAY (Solway) Best breeder, *Gambusia marshi*; and Top Junior THOMAS McCARTNEY (Greenock).

Solway emerged as the top Society closely followed by Greenock.

The Greenock Club are holding an Inter-Club night on Thursday June 27. The following species of fish can be entered from 7pm:

1. GUPPIES, 2. PLATIES, 3. SWORDTAILS, 4. CATFISH (A), 5. CATFISH (B), 6. CHARACINS (A), 7. DWARF CICHLIDS, 8. BREEDERS EGGGLAYERS, 9. BREEDERS LIVEBEARERS, 10. ANGELFISH, 11. COLDWATER, 12. JUNIOR EGGGLAYER, 13. JUNIOR LIVEBEARER.

The Table Show will be hotly contested by Clubs from GREENOCK, CLYDE, CASTLEMILK, INVERCLYDE, AYR, PAISLEY and the oldest established Club in Scotland, the SCOTTISH AQUARIST SOCIETY. There is a junior section to help encourage juniors to show their fish. The Greenock Club has a very strong junior section called the 'Tankers' with the membership over 30. At the Inter-Club Show, SCOTTISH SUPREME CHAMPION ALLAN JAMES will be giving a lecture and slide show on *CORYDORAS* imitators. There will be a Fish Auction, Raffle and Canteen facilities. The Show will be run under F.S.A.S. Rules.

The idea behind inter-Club nights is to get Clubs together

to discuss all aspects of our fascinating hobby and get some different ideas on breeding fish. The night also helps to encourage juniors who are the future of our hobby so we must endeavour to teach them all we can.

Any other Club and members of the public are more than welcome to come to the Show. For further details phone JIM SHEEKY on 01475 704219.

## Bracknell take revenge

At the second leg of the three-way InterClub between Hounslow, Bracknell and Basingstoke, the home team Bracknell took revenge both in the Quiz and the Table Show. K. Solitt took Best in Show with a *Corydoras bolivianus*. Following Hounslow's First Round lead in the Quiz, Bracknell stormed back to win Round Two by nearly four points. At the two-thirds distance, Bracknell now lead Hounslow with Basingstoke third; the final round takes place at Basingstoke on May 10 — will the lead change again? Watch this space!

## Secretary change

The new Secretary of Stafford Aquatic Society is Amanda J. Barlow, 35 Betjeman Walk, Stafford, Staffordshire ST17 9YX. Tel: 01785 224740. The Society meets every second Tuesday of each month at the St Leonards G.E.C. Club, St Leonards Avenue, Stafford.

## KAAS Convention 1996

John Pell looks back at a great event.

It was Saturday, March 16, the place Margate, on the breezy coast shores of East Kent. What, you might ask, makes over 50 people trek to this corner of the south east at this time of the year. Well, they were all heading for the KAAS Convention, sponsored by the Federation of British Aquatic Societies. Due to a last minute closure of premises the venue changed to the Smithys Hotel (deja vu?), apologies to the Bensons for lack of changed



site instructions.

The programme was run on a proven formula covering lectures, an Inter-Group Quiz and a Fish Auction, as well as the less formal imbibing and fraternising between attendees.

Overnight accommodation was available for the enthusiastically over-indulgent and the crazies who wanted to hurl their balls down an alley on the following Sunday (tough luck fellahs and well done to Avis Goodwin — goes to show, it takes more than heavy balls to score!)

Willem Heinz was the speaker for the day coming up with his own version of the day's Television Times. Given the first choice, from a menu of different talks, the ladies opted for the medical programme (must have been his 'bedside manner'). Surgery to repair the tail of a *Cichlasoma festae* — a suture in time and all that! Next up was the travel programme (sorry, gents no sex yet, we're British!); a veritable cornucopia of slides from his 1989 trip to Mexico. Places like San Luis, Potosi Ciudad de Valles, Poza Rica and El Sello peered invitingly from the screen. The diversity of flora and fauna, along with superb pictures of the colour changes of fish, taken firstly from the wild and then after a short period in a well maintained Cichlid tank. Everyone joined in the fun as the first fish caught turned out to be a species of *Tilapia*, however, latterly bemoaned the perpetrator of such misplaced releasing.

The break was devoted to the Inter-Group Quiz, where Deal A.S. held off a strong challenge from 'Colisa chuna', the Dutch team. A fishy 'Win, Lose or Draw' round had teams, officials and audience alike rolling in laughter with somewhat suspect drawings being matched by some incredibly quick and correct identification!

Then came the DIY programme (no sex yet then?). As Willem put it: "If you want a

bigger fish tank, first build yourself a bigger house!"

So, whilst his builders were at work on the house he was busy getting his 1,000 litre three metre tank built, moved (complete with JCB) and installed — you wouldn't believe the number of different permutations of the same size concrete blocks it takes to get this monster level! A friend in the electrical business fixed up computerised dimmer lighting systems, as he confessed to not understanding the principles in Dutch, let alone how to explain it in English! The tank fully displayed with its pairs of *Cichlasoma melanurus*, *C. godmani* and *C. bartoni* and a group of *Petinia splendida*.

Finally, before the auction, we had some sex! What the female looks for in a partner, some mouthing back and forth, a bit of slap and tickle and, before you know it, the youngsters have arrived (and it's the same with Cichlids, guys!)

Following the Auction, a very well presented buffet was served and thoroughly enjoyed. Raffles were drawn and everyone began to wind down for a relaxing evening chatting with friends, old and new, about all things fishy.

The Chairman of KAAS, John Edwards, and Convention Manager and Quizmaster, Dave Goodwin, and their team including Adrian Dempsey, Eddy Galbraith, Colin Osbourne, Avis Goodwin, Allan Best, Pat Edwards and all others who helped on the day, not forgetting a certain Gary Thwaites who, it is understood, did incredible things on the roof, with black plastic bags, must be praised for making this a highly successful annual event.

Rumour has it that next year's Convention is already being prepared for the weekend of March 15/16, so pencil that in your diary if you don't want to miss out on a very entertaining experience.

**Society World** is provided to help all Societies to promote themselves and their activities. One of the most difficult tasks within any Society is that of Programme Secretary, who is expected to fill every meeting with something of interest. These columns are a source for all manner of ideas for Societies' entertainment, and could lead to many a Speaker finding fame (if not fortune)! So do your bit to let readers know of your good fortune, whether you have found an excellent Speaker or have come up with good ideas which have helped to entertain your Club's membership.

We can help you only if you provide the information. Depending upon availability of space, we are also pleased to incorporate highlights of Show results (major prizewinners only, please, and DO please include first names) together with photographs if they are suitable.

And, of course, ensure that as many people as possible have advanced warning of your Meetings, Shows, and other events, by sending us details for our comprehensive 'Diary Dates' column in good time.

Send your information to: **Society World, Aquarist & Pondkeeper, Caxton House, Wellesley Road, Ashford, Kent TN24 8ET**; or you can e-mail direct to: [societyworld@btinternet.com](mailto:societyworld@btinternet.com) please let us have your information at least six weeks prior to publication.

## DIARY DATES

### JUNE

- 2 Erith & District A.S. Open Show at Littlebrook Sports & Social Club, Littlebrook Power Station, Manor Way, Dartford Kent
- 4 Gloucestershire A.S. Birthday Party!! Quiz, Buffet and Raffle. Table Show: Catfish and A.O.V. Bell & Gavel, Cattle Market, St Oswalds Road, Gloucester. Contact Andy (01452 372948) or Christina (01242 520428)
- 9 Tameside Aquarist Society. Open Show & Auction. Festival Hall, Queen Street, Denton. Contact Bob Street, Show Sec., 3 Great Gable Close, Higginshaw Village, Oldham, Lancashire OL1 3RF (0161 287 2305). Next Society Meeting (every fortnight) — 12th June at 'Q Inn' Market Street, Stalybridge, Cheshire. Contact Nora Green 0161 339 6593
- 9 Yorkshire Cichlid Group. Summer Auction, St Anne's Church Hall, Wrenthorpe. Contact Andrew Ripley 014390 441759
- 13 Tyne/Tees Area Association. Talk by Roger Foggitt, Tetra. Stella Maris Social Club, Washington. Tickets, including Buffet £2.00 from Mrs J. A. Bell 01325 466630
- 14 Yorkshire Cichlid Group. St Anne's Church Hall, Wrenthorpe, Wakefield. 8pm. Peter Liptrout with 'Madagascan Cichlids'. Contact Dave Wright 01924 362113
- 16 Dunstable & District Aquarist Society. AUCTION 1pm. Vernon Room, Queensway Hall, Dunstable. Booking in of lots 10.45am - 12.00 noon. Telephone Booking in, phone Gordon on 01582 667287. All fish must be adequately bagged
- 21 Basingstoke A.S. Club visit to Wyld Court Rainforest Gardens. Contact Elaine Dean 01734 701461
- 23 Tyne/Tees Area Association. Auction 12 noon. R.A.O.B. Club, Birtley. Booking in from 10.30am.
- 23 Workington and District A.S. Open Show at Cumberland Hotel, Workington. Contact Bernard O'Neill 01900 603082
- 30 Association of Midland Goldfish Keepers. Open Show Foleshill Community Centre, Foleshill Road, Coventry. 10.30am. Contact Anne Bloor, 10 Barnett Crescent, Woodford Halse, Daventry, Northants NN1 3SP (01327 261198)
- 30 St.Helens A.S. Open Show and Auction. Jacobs Social Club, Long Lane, Aintree, Liverpool. Benching 11.00am-12.45pm. Judging starts 1.00pm prompt. Contact Mes J. Steadman 0151 426 4213
- 30 Seascale Junior Fishkeeping Society. 1st Open Show and Fish Auction. Seascale Primary School. Celebrity Guest — Geoff Capes. Contact Chris and Helen Steele 019467 28179

## 1996 OPEN SHOW DATES

(Rule Codes: A = A of A; FB = FBAS; FN = FNAS; FS = FSAS; I = International Goldfish Standards; N = NEFAS; U = U/SofA; Y = YAAS)

- 2 June Erith & DAS (FB)
- 9 June Derby A.S. (Y)
- 9 June Merseyside A.S. (FN)
- 9 June Redcar A.S. (N)
- 9 June Tameside A.S. (FN)
- 23 June YAAS Scunthorpe A.S. (Y)
- 23 June Workington A.S. (FS)
- 30 June Association Midland Goldfish Keepers (I)
- 30 June St Helens A.S. (FN)
- 30 June Seascale Juniors A.S. (FB)
- 2 July Sandgrounders A.S. (FN)
- 6 July Port Talbot A.S. (FB)
- 7 July NW Cichlid Group
- 7 July Scarborough A.S. (Y)
- 21 July Aishby A.S. (Y)
- 21 July Phoenix A.S. (FN)
- 28 July K.A.A.S. (FB)
- 3 August Gloucestershire A.S. (FB)
- 4 August Peterhead A.S. (FS)
- 11 August Dunfermline A.S. (FS)
- 11 August Grimsby & Cleethorpes A.S. (prov.) (Y)
- 11 August Salisbury A.S. (FB)
- 18 August Perth A.S. (FS)
- 25 August Glenrothes A.S. (FS)
- 1 September Crumlington A.S. (FB)
- 1 September US of A Show (USA)
- 7 September Bristol A.S. (I)
- 8 September Lincoln & DAS (prov.) (Y)
- 14 September Hounslow A.S. (FB)
- 15 September South Scotland A.S. (FS)
- 15 September Mid-Sussex A.S. (FB)
- 15 September Plymouth A.S. (FB)
- 22 September Grampian A.S. (FS)
- 28 September Bristol Tropical F.C. (FB)
- 28 September Northern Goldfish P.S. (I)
- 29 September Darwen A.S. (FN)
- 6 October Grangemouth A.S. (FS)
- 6 October Halifax A.S. (FN)
- 6 October Washington A.S. & P. (FB)
- 13 October Solway A.S. (FS)
- 20 October Leeds A.S. (Y)
- 20 October West Cornwall F.K. (FB)
- 3 November Supreme Festival of Fishkeeping (FB)
- 10 November Bradford A.S. (Y)