

# AQUARIST & PONDKEEPER

JULY 1997

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The Better Fishkeeping Magazine

## INSIDE

- *Win the New TetraTec Internal Filter from TETRA*

## PLUS

- *MAKING A BOG GARDEN*  
We explain how to make your own garden marsh



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JULY 1997 VOL 62 NO 4

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**EDITOR**  
Dick Mills

**ART EDITOR**  
Mick Beeken

**ADVERTISEMENT  
MANAGER**  
John Young  
Tel: 0181 904 8886

**SALES EXECUTIVE**  
Ian Hunter  
Tel: 01233 636349

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**TELEPHONE:  
SUBSCRIPTIONS/  
ADVERTISING AND  
PRODUCTION/  
CLASSIFIEDS & BUYERS  
GUIDE/ACCOUNTS**  
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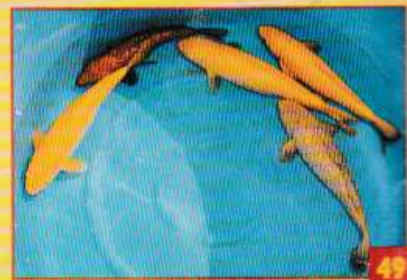
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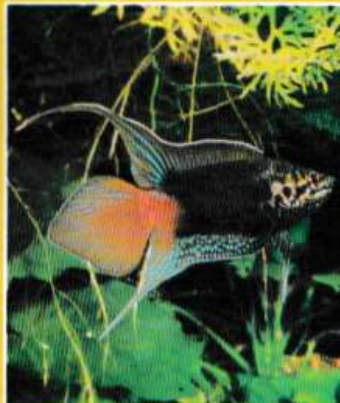
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The male Paradisefish could be likened to the feathered Bird of Paradise when it displays its 'plumage' (in this case, fins) and intensified colouration in pre-spawning courtship rituals.

PHOTO: MP. & C. PIEDNOIR

**Comment**

It's not often you meet with someone who's been 'on the other side' but I think I've been there!

It was my turn to 'appear' as a guest on a fishkeeping Forum on the Internet in deepest Cyberspace and it really was quite a unique experience.

Thanks to modern (or should that be modem?) technology, one sits at the ubiquitous computer screen waiting, like some medium in a self-induced trance, for others to get in touch. Suddenly, a line of text runs across the screen with a greeting or query! The immediate reaction is 'Can I type a correctly-spelled reply in time or will the system show up the deficits of my one finger, two thumbs style of typing?' Fortunately, the system is not quite instantaneous which solves that problem but throws up another. Whilst you are composing your reply some other contact joins in and so you may be answering two questions consecutively but your responses don't always pop up on the screen next to the questions (adopting to reading alternate lines can be quite an art!)

Then there's the aspect of not knowing who your correspondents are, or where they're coming from — either geographically (Hi Marija, in Serbia) or fishkeeping experience-wise; then there's always the risk of someone you know slyly slipping in a provocative question under the cloak of a pseudonym! Fortunately, things settle down once people get to know each other, and the hosts in charge of the Forum is always on hand not to let things get out of control!

The benefits are spontaneity, a wide range of questions, and one of the traditional rewards of the hobby — swapping ideas and views. All this is achieved in immediate real time too, no waiting for the postman to call or for next month's A&P to appear.

With the current slowing down of interest this new phenomenon of getting together might just trigger off an upsurge as might the recent major article in one of the Sunday Supplements. One future development would be the involvement of video: imagine the advantage of your contact suddenly showing you the contents of his nearby aquarium live! Before that can happen, you've got to get over the shock of your contact seeing what you really look like — or how green your tanks are!

There's always something new for us to enjoy.

*Dick Mills*

EDITOR

E-MAIL ADDRESS: 101372,3451@CompuServe.com

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TROPICAL

# Oriental Paradise

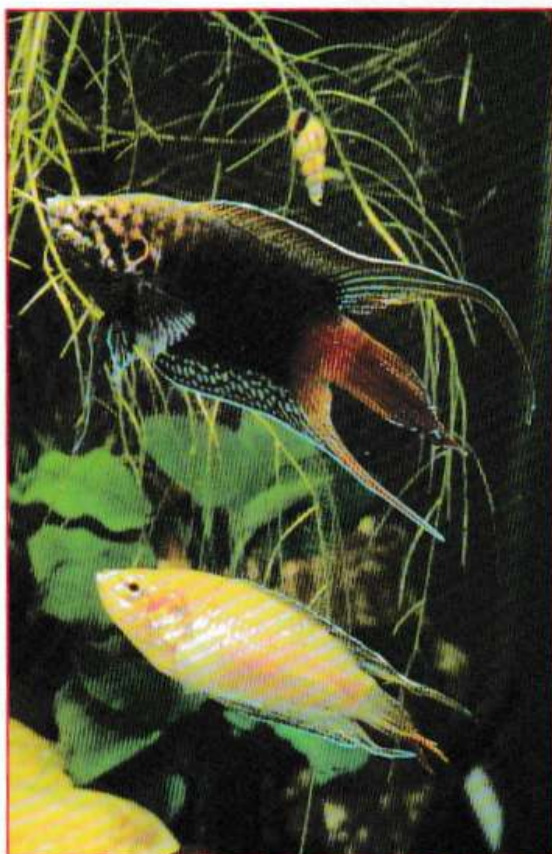
**ROY OSMINT** REDISCOVERS A LONG-ESTABLISHED  
AQUARIUM FAVOURITE

PHOTOGRAPHS BY MP. & C. PIEDNOIR

**A**lthough fishkeeping for ornamental purposes has enjoyed a long history the widespread maintaining of tropical species in a temperate climate is clearly a more recent endeavour, for without the advantages of modern techniques and equipment to help achieve (and more particularly sustain) suitable conditions early aquarists faced a considerable challenge.

Fortunately the exotic species first introduced into Europe was extremely accommodating in this respect. This was the Paradisefish imported by the French Consul in Ningpo, China, during the year of 1869. At least this is the first documented account, but many believe that this handsome creature arrived on our shores very much earlier.

In 1665 the renowned administrator and diarist Samuel Pepys made reference in his writings to a colourful exotic fish which



was 'living in a glass and will do so forever'. Though the precise nature of fish was not described there is reason to suspect that the good gentleman may have been alluding to a member of the Paradisefish group. It is certainly feasible, for this beautiful fish with its wide ranging tolerance to both temperature and living conditions would undoubtedly have been capable of adapting to the probable circumstances. In fact, supported by its accessory 'Labyrinth' breathing organ enabling it to live contentedly in small, poorly-oxygenated bodies of water, it would have been far better equipped to survive in a crude jar or bowl than any true coldwater species. But enough of historical speculation — let's take a look at this fascinating group of fishes and find out what they have to offer modern-day fishkeepers.

Paradisefish belong to the family Belontiidae which are particularly notable in two important respects. Firstly,

their habit of fashioning a nest of bubbles for the reception of their eggs and young and, secondly, the previously-mentioned supplementary breathing facility that they all possess.

They are a remarkably robust group easily able to tolerate conditions which would prove fatal to most other varieties of tropical fish. In many cases a gradual rise in water temperature to 90°F or a drop to 40°F for a temporary period will not cause any real harm. In addition to an exceptionally hardy nature Paradisefish readily breed, are most beautifully-coloured and patterned and display the most flamboyantly attractive fin development. The complete representation being immediately and unmistakably evocative of the Orient, from where of course they originate.

With so much apparently in their favour it is perhaps surprising that they do not enjoy a greater level of popularity among general fishkeepers. Undoubtedly the reason for this is that many are deterred by the fish's reputation for aggressive behaviour and are consequently not prepared to take any chances.

This is a rational and understandable approach for a responsible fishkeeper who should not be in the business of taking risks with our charges or disregarding the advice of experience.

However, whereas pugnacious characteristics must never be overlooked they are, in the case of Paradisefish, sometimes exaggerated and with care it is possible to avoid serious trouble, even in selective communal circumstances.

All members of the group exhibit certain territorial tendencies and like to establish a space in the tank



which they can regard as their own. But, unlike the truly territorial Cichlids, Paradisefish normally claim only a small compartment often not much larger than themselves. If they are to be kept with other species the tank dimensions should be as generous as possible and heavily-planted to provide plenty of cover. Only include streamlined fish of similar size as anything smaller or with flowing fins may prove too tempting or be seen as a challenge.

The best prospects of achieving harmony is to acquire juvenile specimens and allow them to develop and grow within the community rather than suddenly introducing fully-mature adults into an established system. Paradisefish can certainly defend their space and exert their dominance aggressively but, in practice, such is their majestic bearing that a threatening demonstration of flared fins and gill covers is frequently all that is required to make the point. It must always be borne in mind, however, that individual fish will sometimes develop exceptionally belligerent characteristics and effectively become rogues. The situation should, therefore, be continually-monitored and where appropriate

action taken quickly if fatal consequences are to be avoided.

Although Paradisefish can, as we know, adapt to a wide range of temperatures, to achieve optimum conditions it is desirable to establish a species tank where the need for the community compromise is eliminated. Under these circumstances a flexible, cool water system that approximates the seasonal cycle of the fish's natural habitat should be aimed for.

This is by no means critical but extremes at both ends of the temperature scale should be avoided. An ideal winter average would be 50-55°F rising in summer to a maximum of 75°F.

Again the tank should be well planted to provide adequate cover and hiding places to where less-dominant males can retreat as well as females during spawning.

In their natural surroundings Paradisefish frequently inhabit dirty, poorly-oxygenated bodies of water in which many other species could not survive. This is made possible by the highly-efficient accessory breathing organ which allows the intake of atmospheric air. This structure, referred to as the labyrinth, is located on either side of the gill

chamber and consists of numerous thin, folded tissue sheets (lamellae) which have a very rich blood supply. These facilitate a gaseous exchange with oxygen being absorbed into the system and carbon dioxide expelled. Such is the efficiency of this ancillary respiratory organ that the fish has evolved to be extremely dependent upon it and can easily die if denied access to the air, normal gills being generally inadequate to sustain it even in

water containing a high oxygen content.

From time to time the Paradisefish visits the water surface and gulps in air to recharge the labyrinth. Sometimes it will rise slowly in leisurely manner and linger at the surface, on other occasions (if it is alarmed or perceives possible danger) the whole manoeuvre will be completed at great speed. In its natural habitat it must of course be constantly aware of the threat of predation by birds.

Random spawnings in the community aquarium can and do occur but for any sort of controlled breeding attempt a special tank should be set up. The larger this is the better as space is required to rear a good crop of young and will also offer greater opportunities for the female to make herself scarce when necessary. The water temperature in the breeding tank (which should also be heavily-planted) should be several degrees higher than that in which the parent fish have been housed.

The conditioned male can be introduced first followed by the female a few days later. An untidy bubble nest will be constructed at the surface by the male using plant debris to strengthen it, a piece of floating

## TROPICAL Oriental Paradise

polystyrene can sometimes be useful as an additional support. Though the female may take an active interest in the nest-building procedure she must be very careful not to make her presence too conspicuous or she will be attacked.

Once the nest is completed the female will tentatively approach it but is likely to be driven off by the male. This can happen many times until eventually she assumes a submissive semi-vertical posture and the belligerence suddenly ceases. During the courtship ritual the colours of the male heighten to a previously unseen intensity whereas those of the female drain away almost completely.

The pair then engage in a series of embraces beneath the bubble nest where eggs will be released and fertilised. Some float upwards directly into the nest whilst others will be gathered by the male and placed there. This procedure

can be repeated many times over several hours until all the eggs have been discharged.

Under most circumstances now is the time for the female to be removed from the breeding tank as the male will henceforth regard her as a threat to the eggs and respond violently. Take great care when catching her not to break up or disturb the bubble nest; there should be no aeration or filtration in the tank for the same reason.

During the next period the male will spend his time guarding and making repairs to the nest as necessary. The eggs take between 24 and 36 hours to hatch and the fry will be free-swimming after a further three days or so. For a while the male will

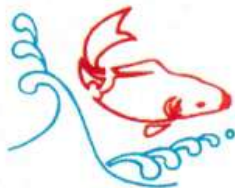
gather up the fry as they venture from the nest and blow them back in, but as they become more adventurous he starts to lose interest and the nest itself begins to disintegrate. He should now be removed as once the young fish become dispersed around the tank he will commence to eat them.

The newly-hatched young require large quantities of food, infusoria to start with followed after a few days by *Artemia nauplii* and other recognised fry foods. It is essential that the breeding tank is kept closely covered at this early stage for two very important reasons — firstly to prevent dust settling on the water and secondly to maintain warm air above the surface. After about three weeks the

tiny fish need to start using the accessory respiratory organ and commence taking in atmospheric air. A substantial dust covering may prevent them breaking through the surface whilst cold air can cause death from chilling.

The Paradisefish (*Macropodus opercularis*) is probably the most commonly seen and is available in a number of selectively-bred colour strains. Native to Southern China, Vietnam and Taiwan it reaches a length of some 7-10cm though appears larger due to the flowing tail section. It will quickly become tame and seems relatively intelligent; it also enjoys a long life span.

Other members of the group include the Round-tailed Paradisefish (*Macropodus chinensis*), the Spike-tailed (*Macropodus cupams cupams*), Brown Spike-tailed (*Macropodus cupams dayi*) and the Comb-tail (*Belontia signata*).



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# Hey Mister, Are You The Fish Expert?

**RICHARD FRIEND** ADVISES ON POND INSTALLATION

**W**e have all had it happen, you have a pond, or even two, that you spend quite an amount of time with. You enjoy talking about and reading about fish, you have books on the subject, you subscribe to *Aquarist* and *Pondkeeper*. Therefore,

as far as the people in your factory or office, your road or even village are concerned, you are the local fish expert, the fish nut, the one to turn to when they, or someone they know, would like to start a pond.

After all, once bitten with the fish bug, you are only too keen to be able to extol the virtues of the

hobby and encourage others into the joys, while missing the pitfalls. So where does your advice start? Often you can remember later what you should have said.

So to help I have listed my six most important points to be considered. As they say 'cut out and keep!' Perhaps you can add some points of your own.

Here are mine:

## I READ

There are lots of excellent books on the subject. Read and study as many as possible, they are written by people who have been there, experienced the problems and the pleasures. This also serves to stoke the fire and get that ambition to own that pond going strong, while helping to discover



PHOTO: M.P. A.C. PEENSBOR

## POND Hey Mister, Are You The Fish Expert?

just what can be achieved.

### 2 WHERE?

Choosing the site of the new pond is all important. This governs all other factors: the type, the shape, the size. One thing to take into account is shade, even partial shade during the day will help to avoid temperature fluctuations, but you do not want to be too close to a tree with all the problems that fallen leaves can bring, also their root systems which can give problems later as the tree grows as they travel an amazing distance from the tree.

You must make sure there are no obstacles in the way either hidden or otherwise, such as drains, house water, gas or electrical supplies.

Siting in a convenient viewing position is to be

considered. Too often the resultant pond is too far from the house; being able to view from a window, or relax by the pond, but within hearing distance of 'your other half' or even the telephone, all need to be taken into account.

### 3 SIZE IS IMPORTANT

Until you have the siting of the proposed pond you cannot decide on the size. This does not just mean the area but also the depth, this is vitally important and often not realised until too late. The old comparison stands good here, of the saucer and

the bucket of water both standing in the sun: obviously the saucer will heat up and cool down more rapidly compared with the bucket. The same effect of rapid temperature fluctuations will be experienced in a shallow pond. Thus, the deeper the pond will be much easier with improved fish health and clearer water. Aim at never less than 2ft 6in depth.

When it comes to the overall size, always go for the biggest that you can accommodate and afford, you will soon come to realise what seemed huge to start with (especially those rigid ponds stacked up

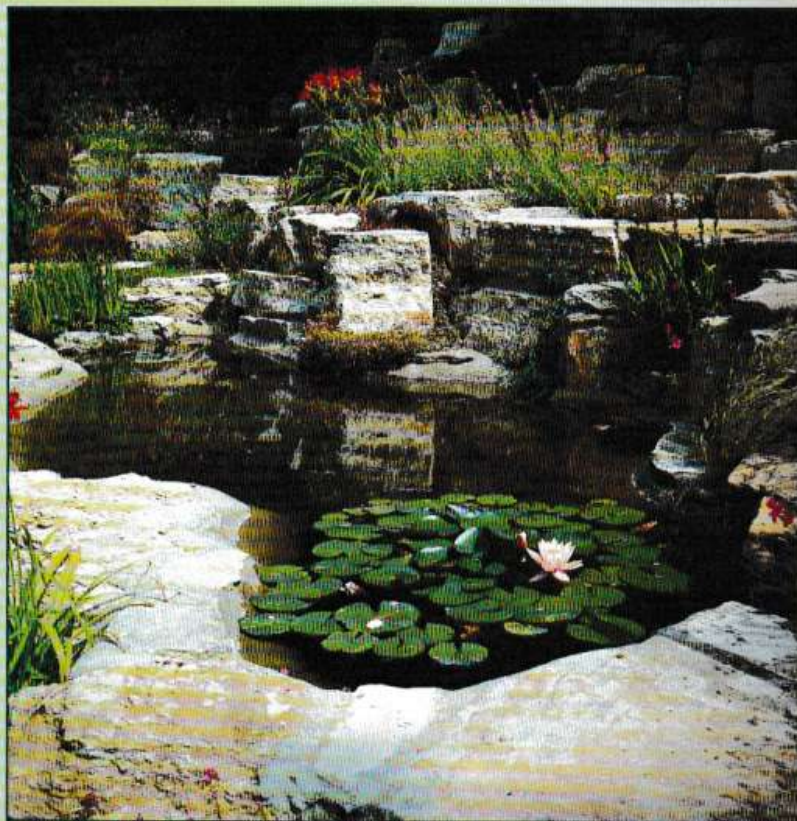
against a wall at the garden centre) is not really so big, once the bug of pondkeeping has bitten and increased stocking levels have to be considered.

### 4 WHICH TYPE?

Only after making a decision on the above can you think about which type of pond you might like to have. That is either wildlife, Goldfish, Koi pond, or a combination of all, formal or informal. The choice is better. Maintaining the pond is limited to the criteria that have already been mentioned. If you only have 4ft by 4ft by 2ft 6in deep available you cannot have a true Koi pond, but could still get a great deal of pleasure from a nice Goldfish or wildlife pond.

Taking the wildlife pond first, and not entering into detailed methods of

PHOTO: PETER ETCHELLS





## POND Hey Mister, Are You The Fish Expert?

construction, the general idea is to have a pond that probably is the easiest to build and maintain yet can still give immense interest and pleasure. The construction can be preformed or liner, the edges must be level with the surrounding soil, with a shallow end and a lot of plant life.

Set up correctly a wildlife pond can have a natural balance. That is with a very low stocking level of fish. Some schools of thought would say no fish at all, a large and varied plant life, and nature allowed to take its course, the pond will tick over nicely with no need for additional filter system or pumps. Therefore, there is no need to be concerned with electrical supplies, or even mains water being no more handy than for the occasional bucketful.

Most of the wildlife will soon appear once you have provided the habitat but it will not do any harm to speed things up a bit by collecting specimens from a friend's established pond. There are, however, some restrictions in place on moving some certain aquatic life, Great Crested Newts being the one that most people know of.

Next the Goldfish pond. The name is a bit of a misnomer these days as there are so many different fish available, but basically now you are starting to talk waterfalls, pumps, filters and possibly

ultra-violet lights. You still could try creating a natural balance, but as we wish to stock more heavily, and feed at a higher rate, then you have to start thinking about all this extra equipment.

The construction can now be from preformed, liner, rendered brick or block, or fibreglass. For simplicity and cost saving the first two are ideal for this type of pond. A raised pond can now be considered, also a waterfall which not only looks very nice, but also helps to add oxygen with its aeration effect, and makes a convenient way to 'lose' (or should that be 'use'?) all that earth that you are left with having dug your pond.

Now of course an electrical power supply has to be available or installed.

This is dealt with later.

Fish for this type of pond need not be limited to just Goldfish such as Shubunkins and Comets, although these should not be underestimated as they have a special beauty all of their own which has been appreciated over literally hundreds of years. Also available are both Golden and Blue Orfe, and Golden Tench and many others that you can enjoy through searching out at aquatic Stores and garden centres, and of course you could always try your first Koi if space permits, but be warned this is when the Koi bug could really strike!

Finally, the Koi pond. Before undertaking a project like this with no pondkeeping knowledge at

all, a great deal of research is needed.

Basically you are talking about a large construction either of formal or informal design, using a liner possibly but more usually block rendered and fibre-glassed, with bottom drains, surface skimmers, large filtration of a third the pond size with vortex chambers and other chambers with various media. Large capacity pumps and ultra-violet lights are the norm.

Koi ponds are usually devoid of any plants, a depth of 5ft is the desired minimum, and many are heated through the winter although this is a luxury, rather than a necessity.

### 5 AFTER CARE

All ponds require some maintenance to a varying degree. Correctly set up, the wildlife pond will almost look after itself, an occasional clean up, best

undertaken in the autumn, with a cut back of overgrowing plants, and a thinning out of fish numbers as nature takes its course. Friends are made now as you pass on excess fish and plants.

With the Goldfish pond the story is much the same, with the addition of watching for fish health problems. Here, however, we have the need to keep an eye on equipment, maintained as manufacturers' instructions. A filter system, if employed, should always be kept running, cleaned only



PHOTO: GORDON WIGENS

## POND

### Hey Mister, Are You The Fish Expert?

when flow rates drop, and the only cleaning agent must be a bucket full of pond water. Where a UV is in use a new tube should be

now even low voltage ultra violet units on the market.

These can all be run from a transformer in the house or garage and then low



PHOTO: A&P LIBRARY

installed at the start of each new season, this being the time to give it a good clean as well.

With Goldfish ponds you will want to feed your fish. This is often for the enjoyment of the pondkeeper as much as the fish. Here moderation at all times must be stressed, it is all too easy to overfeed — this is probably the killer of more fish than any other factor — and never feed below a water temperature of 10°C.

Melt an area of any covering ice in winter with hot water in a bucket, never try smashing the ice with a hammer. Keeping an area ice-free is to allow gasses that build up under the ice to escape.

The after care of the Koi pond is becoming much more specialised. Here we are starting to have to look at carrying out water tests with tests kits for ammonia, nitrite and pH, even oxygen levels. Water purifiers for

initial filling and also for top-ups have to be considered. Filter maintenance is all important, pulling bottom drains and vacuuming become daily jobs.

Keeping and gaining knowledge is ever important, and perhaps the best advice of all might be to join a specialist Society such as the British Koi Keepers Society and become a member of the local branch. Here you will find a wealth of knowledge and friendly help.

One word of warning when contemplating a Koi pond, you will, without doubt, quickly go the way of so many before you, and become obsessed! These wonderful creatures should have to carry a government health warning!

## 6 SAFETY

Perhaps the thought of anything dangerous is furthest from the new

pondkeeper's mind, but make no mistake there are three very important hazards to be considered:

(a) Something very few would think of is that of a possible cave in when digging deep holes.

Working at the bottom of a 6ft excavation needs some form of shoring up. When not absolutely sure seek professional help. With the availability of mini-mechanical diggers, some of the hard work is taken out of the job but extra care needs to be taken by those inexperienced in using these labour-saving devices.

(b) Electrical supplies. Always use RCD'S. Again, if in doubt seek professional advice. **ELECTRICITY AND WATER DO NOT MIX.** There is no second chance.

There are alternatives to supplying mains electricity to your pond these days with very good low-voltage pumps, lighting systems, and

voltage run out to the pond. A safe and sensible idea.

(c) Children love ponds but again: **CHILDREN AND PONDS DO NOT MIX.**

I had bitter proof of this when, despite two adults talking only a few feet away from one of my ponds, a child of four fell in behind them and was completely underwater without them even noticing. Fortunately, another person had seen the situation and all turned out well after a screaming session from both mother and child.

So to sum up, as you can see, explaining to some prospective new pond owner how to go about their task can be quite involved. Following a predetermined checklist then explaining more fully any necessary areas can make things easier and hopefully put them on the right track for a long-term future in a very rewarding hobby.



# FROGS & Friends

By BOB and VAL DAVIES



## HERP FACT FILE

### Beauty is only skin deep (reptile colour)

Many living creatures are often described as 'showy, attractive or even 'beautiful' and indeed they are to human eyes. Throughout the various hobbies of live animal keeping it is mainly the colouration which has determined the popularity or otherwise of certain reptiles, fish, birds, etc, although other factors may also influence it but, generally speaking, the colourful appeals more than the plain and dull. Animals' colouration did not however evolve for humans' aesthetic appreciation and there are many reasons for it: camouflage, species recognition, sexual attraction, threat and absorption or reflection of heat.

The colours of reptiles are determined by cells containing pigments. These cells, which lie mainly in the dermis (the lower layer of skin), are collectively named chromatophores. The most common pigment is melanin which, depending on its concentration, produces black, various shades of brown, grey and yellow. It is quite effective in protecting against the dangerous lower wavelengths of ultraviolet rays. Red, yellow, orange and white pigments can also be present in a complex arrangement which gives an infinite variety of shades. This is not the full picture — light falling on the skin of many snakes is split into its spectral components producing an iridescent effect, the degree of iridescence also being affected by the underlying pigment. The snake's movement (or that of the observer) can quickly cause the effect to alter. Certain snakes which have annulated bands of colour can, when moving fast, become an iridescent blur which confuses the observer's/predator's eye. This effect is known as interference colouration. Colouration can be further affected by cells



Female Carpet Chameleon (*Chamaeleo lateralis*). An alternative name which is greatly demonstrated by this gravid specimen is Jewel Chameleon.

PHOTO: BOB & VAL DAVIES

containing colourless crystals which refract and reflect light. This phenomenon, known as Tyndall-scattering, determines the colour we actually see; for example, blue and yellow pigments appear as green — a common colour in many reptiles;

mainly for camouflage.

Many species have a constant colouration although this often fades with age. Others can change colour, and certain juvenile snakes and lizards change as they mature, but change is more common among lizards than other reptile groups; it is often seasonal as in the male Green Lizard (*Locerta viridis*) which develops blue face patches in Spring. Collared and Leopard Lizard females develop bright orange patches after mating to deter other suitors. Relatively slow colour changes are largely produced by hormonal activity by glands such as the pituitary but rapid colour change is mainly a nervous reaction. Although male lizards such as Calotes and Red-headed Agamas can intensify their colour in response to a threat (or a female), the fastest and most dramatic change is to be found in Chameleons. Even so it varies with species. Chameleons do not change colour to match their surroundings — it is determined by temperature and mood. In some species it is quite subtle but gravid females of species such as *Chamaeleo minor* and *C. lateralis* take on unbelievable hues whilst males, to attract a mate or repel a rival, are also capable of extremely rapid and dramatic changes.

This may not be the full story. Reptiles do not necessarily see each other as we do; research with Desert Iguanas (*Dipsosaurus dorsalis*) suggest that some can see ultraviolet light — their images may well be different to ours.

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## Outdoors

A tragedy occurred in our frog pond: having previously reported substantial amounts of spawn this year the sheer volume of spawn overloaded the pond. As the jelly started to disintegrate it began to pollute the water. This, plus the large amounts of unused sperm shed by the males, produced what we

assume was a build-up of protein which proved too much. The first sign was green scum on the surface, the water then turned onto a thick foul 'soup'. For a number of reasons our vigilance was relaxed at the time and once aware of the situation it was too late for many of the tadpoles which added to the already high pollution. The surviving tadpoles were mainly clustered around the sides of

the pond just below the surface. A few were seen to swim rapidly across the surface of the water actually breaking the surface, indicating that the lower reaches were too foul and deficient in oxygen.

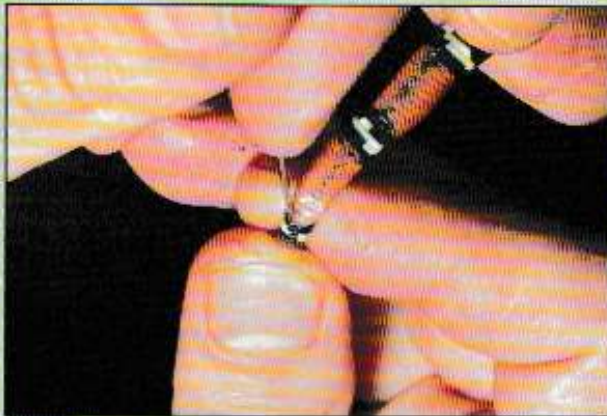
As many tadpoles as possible were netted and transferred to various containers including some odd white kitchen sinks. This salutary lesson will not be ignored next year.

## Sexing snakes

For anyone wishing to breed snakes the obvious starting point is to obtain a sexed pair. Sexing snakes can be difficult for the inexperienced. As mentioned previously certain lizards are sexually di-morphic (or sexually di-chromatic) which makes the task easier but sexual differences in snakes are often quite subtle and in some species may be difficult to assess even for the

experienced keeper. Di-chromatism (colour differences) is quite rare in snakes and will probably not be seen in the majority of snakes commonly kept in the hobby. Although there are exceptions general pointers to look for are: a thicker body often denotes a female — this is necessary for eggs/young to develop but of course males can sometimes be obese which would be confusing. A longer tail usually denotes a male, the tail base is often thicker due to the presence of the hemipenes (divided copulatory organ). Counting the scales of a sloughed skin can be useful if the keeper has access to documented scale counts for various species.

Boas and Pythons normally show spurs on either side of the cloaca (vent), in males these tend to be longer. These comparisons are better done with several specimens as they can be rather subjective and may be difficult to determine in



Hatchling Sinaloa Milksnake (*Lampropeltis triangulum sinaloae*) being probed. It is important to select a probe of the correct thickness. PHOTO: BOB & VAL DAVIES

younger specimens especially hatchlings.

Two other methods of sexing are often used by keepers. 'Popping' is carried out by placing the thumb behind the cloaca and using gentle forwards pressure to produce an eversion of the male's hemipenes. However, in some specimens this eversion may be difficult to produce (especially if the snake has milked up for sloughing). Failure to evert does not necessarily mean the animal is a female. In female hatchlings confusion can also be caused by the eversion of two reddish organs which are the external openings of the scent glands. Sub-adult and

adult specimens are difficult to 'pop'.

Probing is carried out using a lubricated stainless steel sexing probe of the correct diameter. Petroleum jelly and surgical jelly are often used to lubricate the probe but since both can be spermicidal they should not be used. Physiologic saline is now recommended. The lubricated probe is placed into the snake's cloaca pointing towards the tail tip. It is helpful to have someone hold the head and body of the snake. Gently rotating the probe facilitates insertion. Penetration is greater in males as the probe measures the length of the inverted hemipenes.

The depth of penetration is measured against the subcaudal scales on the snake's tail (for certain species this is documented). Great care is needed with both 'popping' and probing as permanent damage can result.

## Amphibian omelettes

Having previously mentioned (1995) predation by Newts on their own eggs and those of Frogs and other Newts it was interesting to hear of some research in the USA which indicates that female Red-spotted Newts

(*Notophthalmus viridescens*) in controlled conditions showed a preference for eating the eggs of other females rather than their own although they had no such qualms over eating their own larvae after hatching. The conclusion was that they can somehow recognise their own eggs, possibly the jelly contains an individual 'scent' which they recognise. In the wild predation on eggs by adults may be reduced; the eggs are secreted away in tangled vegetation and the adults would presumably have various other food items to hand. Even so it must happen and larvae have many other predators once hatched. This species lays an estimated 200 or more eggs which obviously ensures that some survive in spite of all the perils.



American Red-spotted Newt (*Notophthalmus viridescens*) have shown selective cannibalism where eggs are concerned. PHOTO: BOB & VAL DAVIES

Although many adult amphibians exhibit varying degrees of toxicity from extremely powerful to simply unpleasant-tasting, certain predators have adapted to eating them; even the Arrow-poison Frog, *Phylllobates terribilis* (thought to be one of the world's most poisonous creatures), has been observed providing a meal for a snake, the properties of eggs and tadpoles has not been fully researched.

Goldfish will readily consume Common

Frog tadpoles but have been seen to spit out Toad tadpoles. The toxins of some Arrow-poison Frogs (*Dendrobatidae*) apparently develop as the froglet starts to feed — the diet contains insects which feed on alkaloid-producing plants, the alkaloid poison then accumulates (some are also synthesised) in the frogs' bodies.

The Marine or Cane Toad (*Bufo marinus*) is evidently toxic at all stages. Adults possess toxic secretions powerful enough to kill large predators such as dogs whilst eggs have caused human deaths in the Philippines after being used as an ingredient in soup.

# The Patter of Slimy Feet

**GEORGE SMITH**  
RELIVES HIS  
EXPERIENCES IN  
'CREATING  
WETLANDS  
IN THE HOME'

PHOTOGRAPHS BY  
THE AUTHOR



**M**y house and garden are nature reserves. Submerged beneath the clutter of a suburban 'semi', creatures, ancient in the age of dinosaurs, are at large; life and death struggles are being fought out in primeval swamps, marshes and ponds — some nearly 2ft across.

The problem is frogs you see; well not just frogs but toads, newts and all their separate juvenile manifestations. As I understand it, they are being made homeless and that is why they have to come and live with me; at least that is what my wife says and who am I to argue?

Apparently, hardly any of our native species of amphibians are protected by

law, the result being that nearly 200,000 ponds have been lost over the last 50 years. Each of us, in consequence, must rally round and do our bit for conservation and my contribution is to act as unpaid landlord to colonies of cold-blooded carnivores.

It began in a small way — as these things do — I came home from work one day to find that the goldfish bowl

had reappeared; since the demise of 'Muffin and Martin', our two Rosy Minnows, the bowl had been hidden away in the loft, yet there it was on the bookshelf, a tangled green globule of water and weed, the sole occupants a pair of peripatetic snails making an escape bid up the inside of the glass. I ignored it at first, thinking it to be decorative rather than functional but



ABOVE AND LEFT  
Raised ponds made by old  
laboratory sinks.

BELOW RIGHT  
Frogs taking up residence.

the slime that I had mistakenly assumed to be something to do with the snails gradually began to wriggle with life.

The tadpoles emerged a few days later by which time there were additional frog tadpoles numbers 2, 3 and 4. These were similar to the goldfish bowl creche in all respects, other than size, assuming, as they did, of our beer and only brandy glasses. Before long there were tadpoles in the toilet (well the window ledge in the toilet, anyway), tadpoles in the bathroom, tadpoles in the kitchen and tadpoles on the stairwell. Now I have nothing against tadpoles, I think of them as anonymous black goldfish frogs, however, are a different

matter. In my innocence I had somehow assumed that the tadpoles would return to their ancestral homes as soon as they had sprouted legs — I was mistaken.

For the first time in aeons a space appeared on top of the sideboard, to be occupied, in short order, by a lidded aquarium — the base of the tank was lined with crushed barbecue charcoal, followed by cor-

compost, broken plant pots and stones. My wife soaked the compost with rainwater and planted a few ferns, giving the tank the appearance of a miniature Jurassic Park. I had guessed that this was to be another of her 'designer' plant pots but, as I was trying to work out the purpose of the flat bowl filled with water in the middle, I noticed several tiny pointed bottle-green

faces peering out from the fronds of the ferns.

The frogs were completely impervious to my presence; still and impassive, they gazed blandly into space — indeed, until my daughter deposited a fresh worm dinner in the tank there was so little movement I had thought that they might be ex-frogs. However, on the appearance of a wriggling meal, they pounced like lightning.

Now I must confess that all frogs look the same to me: to be honest, they look like tiny Sumo wrestlers with frogman's flippers yet, according to my wife, there are three native frogs in the UK — namely the Common, Edible and Marsh varieties. The occupants of 'Jurassic Tank' were the 'Common' sort, although I argued (unsuccessfully) that the edible species had more immediate practical value.

The frog tank became, within days, an object of delight to all the small children of the neighbourhood — whole school parties congregated in our house. The frogs wanted for nothing — armies of infants collected worms and slugs; a favourite trick being to deposit a hapless Cranely



POND  
The Patter of  
Slimy Feet

in the tank (or 'terrarium' as I was told to call it) and wait for its inevitable demise. The frogs were generally less trouble than the children



ABOVE  
Sinks raised on bricks for treatment.

RIGHT  
Treating surface with PVA.

and I grew quite fond of them — the frogs that is — until my daughter invented a new game.

The terrarium, she pleaded, was too cramped for her 'pets' and, therefore, the by now lively frogs should be allowed the occasional stroll around the house to get the feel of the

place. Naturally I was against the idea but it was, inevitably, only a matter of time before I found them bouncing across the kitchen floor, usually when I was in the process of removing a hot pan from the oven. On other occasions I would find them staring at me, with sad, bulbous eyes, from the bottom of the bathroom sink particularly when I was most in a hurry to get ready for work. Enough was finally enough and the colony of amphibious lodgers was forcibly evicted into the garden, much to my daughter's disgust.

The subsequent arrival of the sinks took me by surprise — large and small ceramic laboratory sinks to be exact, piled in an untidy heap in the middle of the lawn — my wife had somehow obtained them following the demolition of nearby school laboratories — how she got them home heaven knows, even the smallest weighed several kilograms, whilst the largest nearly caused me a

permanent injury when I tried to shift it in order to mow the grass.

The following weekends were spent embedding sinks in the flower beds at the edge of the lawn, a sight that provided much amusement to the neighbours. The sinks were merged into the rest of the garden by placing small stones around their edges; these later served a dual purpose as frog 'sun-loungers'. The existing grass verges and flower beds were then left to encroach such that, within a few weeks, the 'ponds' became virtually invisible (the nearby rhubarb clump was later the children's favourite spot for finding frogs). After filling the sinks with rainwater they were planted with an oxygenating weed ('Water Starwort') and my daughter's 'pets' moved in.

In a separate corner of the lawn I was struggling with the biggest of the sinks, which my wife had asked me to raise up on bricks and level, after which she applied a coating of water-based PVA adhesive. This was a new development and for a while I couldn't figure out what was happening. I was even more confused the following weekend when I found my wife mixing



POND  
The Pitter of  
Slimy Feet

together 'ready-mix' concrete and peat substitute (2:1 'ready-mix' to peat, she tells me) then slapping it, by hand, on to the coated outer



surface. This peculiar mixture, once dry, has the appearance of natural brown stone, enhanced recently by the acquisition of a yellow lichen growth. The sink in a short time became a stone pond, however, unlike other 'ponds', it was fitted with a plug and could therefore be drained for cleaning during the winter. It was later linked into a corner of a raised flower bed, so that the web footed inhabitants could wander off around the garden if they felt so inclined. By the time it was finished, to tell the truth, it didn't look too bad, anyway the frogs seemed to like it — they have been there ever since (winters excepted).

To complete our ensemble of aqueous habitats, miniature 'marshes' were manufactured — these were put together utilising plant pots that normally stayed in the shed until December when they were brought out for the Christmas tree. Each of these was lined with a plastic

bag to prevent (yes, I said prevent) free drainage and in went the obligatory handful of barbecue charcoal (it prevents the pots getting stagnant apparently). The pots were filled with the remnants from the previous years 'grow-bags', then, after saturation with rainwater, set

with marsh plants consisting of 'Ragged Robin', 'Trises', 'Bugles' and 'Water Forget-me-nots'. These miniature 'marshes' were subsequently sunk into the ground near to the 'ponds'.

In consequence our garden can now boast several ponds, a few marshes

and the occasional swamp, not to mention a flower bed, a vegetable patch, the odd line of washing, a child's inflatable paddling pool with a hole in it, a swing, a broken climbing frame plus the rest of the paraphernalia of a typical family garden. This consequently is the natural cycle of wetland life in a domestic nature reserve — tadpoles grow up in the safety of my brandy glasses then move on to join their larger cousins in the garden 'sinks'.

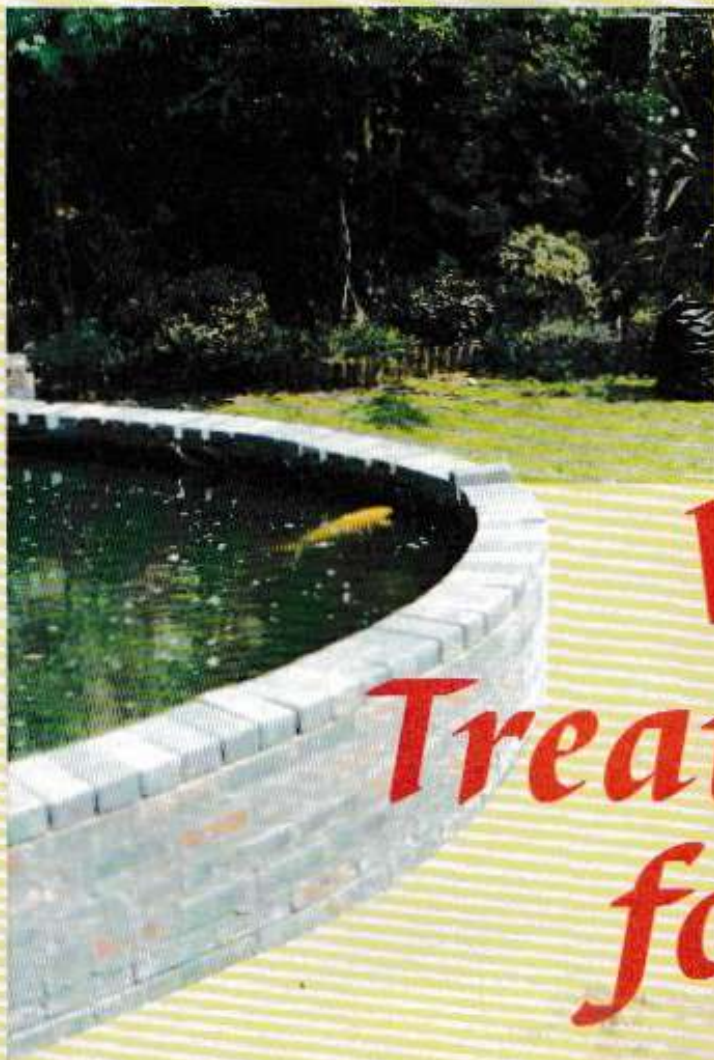
We have since produced four generations of frogs that would be unable to recognise a fish or a duck or, indeed, any sort of aquatic animal, other than a water snail. I hope, in their detached way, therefore, they now look upon me as both benefactor and benign father figure and in consequence return my hospitality by eradicating the insatiable slugs that inhabit my vegetable patch — after all we are now 'family'.

ABOVE  
Leveling in position.

BELOW  
Application of peat/cement mix.







# Water Treatment for Koi

**ANN TELFORD** TAKES OUT MANY OF THE MYSTERIES FROM THIS OFTEN-BAFFLING SUBJECT  
PHOTOGRAPHS BY THE AUTHOR

**K**oi keepers are described time and time again as 'water keepers'. It's a grand

description but what does it really mean?

Koi are ornamental carp. Carp are freshwater river fish. They evolved while experiencing fresh, clean

unpolluted river water perpetually coming into their 'home'. This water not only kept arriving fresh and clean but it also 'swept away' the muck and rubbish

that accumulates through bad housekeeping. Koi-keepers are therefore landed with the job of emulating an open water environment (the river) in a closed water

## KOI Water Treatment for KOI

situation (the pond). A daunting task but if successfully instigated and maintained the Koi will be far healthier. Successful keepers can relax and enjoy their healthy, happy Koi. This beats being a frustrated keeper lurching from one Koi health problem to another! So how do we reach this nirvana?

To conquer this 'water-keeping' lark it is important to master three different things, each of which is important for good Koi health.

### NEW WATER

Any fresh water put into the pond comes into this category.

Examples:

#### Rainwater:

Some rainwater will always enter ponds unless you are the rare Koi keeper who builds a roof or pergola over the pond. Rainwater is too acidic for Koi and certainly we see our own Koi flicking and flashing to show they are 'uncomfortable' after heavy rainfall — and we don't live in a 'heavy industry' area.

Rainwater is not the ideal water to use to fill or top-up ponds. There is insufficient alkalinity to maintain a stable pH, essential minerals are missing and all rainwater contains some pollutants. Rainwater is evaporated ground or sea water sucked up into the atmosphere which forms rain clouds. Chemicals, etc., are also sucked up with the water into the rain clouds, it isn't just pure, clean water which forms rain.

**Streams:** Some Koi

keepers are lucky enough to have a stream running at the bottom of their gardens. The temptation is to feel that there is this free supply of clean water for the pond plus somewhere to discard old pond water. Not so! Stream water contains run-off water from such things as fields, rubbish dumps, etc. There is an additional major problem: it is illegal to draw off water from streams or rivers contaminated water without the appropriate licences. Sneaky water usage

and water dumping could be a painfully expensive error!

**Tapwater:** This is usually the most readily available water to the fish keeper and, believe it or not, is usually the cleanest water available. Remember that water companies collect rainwater, river water, etc. and clean it up for our use. Like all good things, there are some disadvantages.

Primarily tap water is designed for people and unfortunately water needs for people and for fish are

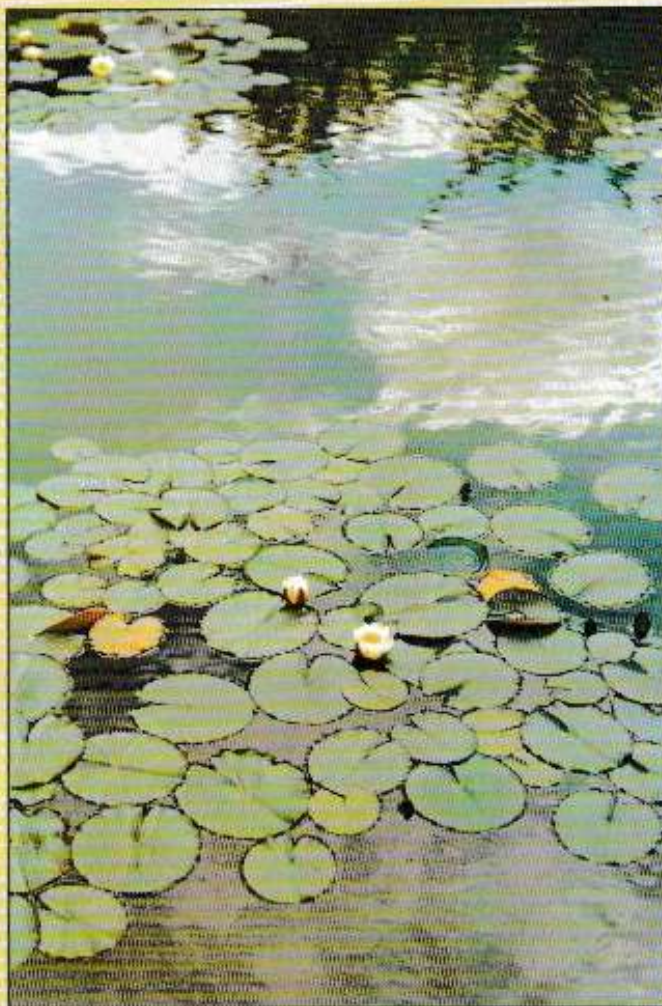
different. What we need, and can tolerate, in water ourselves can damage fish. Therefore, the fish keeper starts with 'clean' tapwater and has to 're-design' it for fish.

One group of substances we desperately need to have and fish need to avoid in tapwater are disinfectants. They prevent us from catching typhoid, dysentery and other nasty diseases but they damage fish gills. The disinfectants are free chlorine (which you can taste and smell) and chloramine (which is tasteless and odourless). Free chlorine can be sprayed or gassed-off, chloramine is far harder to reduce as it is the 'long-term' disinfectant and is designed to stay in water for a long time. In some UK tapwater pesticides are above long-term safe levels for fish; if so, they will need reduction.

Tapwater contains metals from natural sources, water also collects metals from iron mains, lead and copper pipes as well as brass.

plumbing fittings. The need to lower metals can vary from minor tweaking to massive intervention.

How do you find out what is in your tapwater? Water companies collect test information for all the different water areas in the country. They collate this information in 'Drinking Water Reports'. A telephone call to your water company will obtain a copy of the report for your area, free of charge. Free — a magical and rare word for



KOI  
Water Treatment  
for Koi



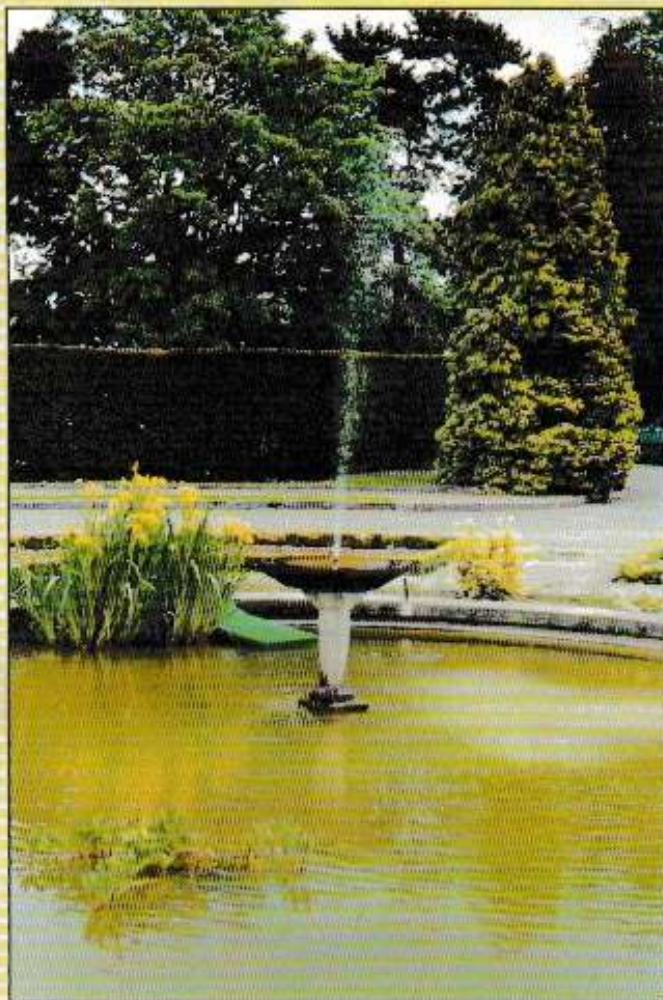
## KOI Water Treatment for Koi

Koi keepers!

Having found out what is in your water and perhaps having decided that you need a tapwater purifier it is very important to make the right choice. Any company worth their salt will analyse your report for you and work with you to make sure you choose and use the right equipment correctly.

Choosing a tap water purifier for fish is a minefield as the vast majority of purifiers on the market are designed for treating tapwater for people — that's not very helpful knowing that peoples' and fishes' water needs are different. To be rather technical for a moment: The majority of domestic tap water purifying cartridges sold in this country are manufactured in the USA. They are not designed to treat tapwater for fish.

American testing is different to testing criteria used in the UK. American testing occurs on warm water (ours is relatively cold), their gallons are smaller than ours and they do not test for the reduction of chloramine (which is found widely in UK tap water). Basically, American testing programmes are not designed to test a product's performance on UK water conditions. Our own WRe do not accept American test results for UK re-certification purposes. The WRe does not test for fitness-for-purpose nor do they have testing programmes for the treatment of water for fish.



If major American and UK testing protocols do not tell you whether a tap water purifier is suitable for treating UK tapwater for fish, how do you know what to use? That's a tricky one.

Domestic purifiers are unsuitable for fish protection. They do not clean water sufficiently for fish. Some contain metals like aluminum dioxide, silver or a mixture of copper and zinc; purifiers containing these metals

should not be allowed near water for fish.

Your only means of finding out whether a tapwater purifier will really protect your fish are:

(a) For UK performance testing must be based on UK tapwater.

(b) Testing must be designed for fish needs.

(c) Testing is only relevant if the 'cleaning materials' in the purifier were tested to exhaustion.

*Illustration:* One American cartridge rated on American

test results for treating around 20,000 US gallons for free chlorine reduction was tested on UK tapwater containing 'average' total chlorine. The testing showed that under these conditions the cartridge had an effective total chlorine reduction life for fish of around 2,000 UK gallons. Thus, using the same cartridge to treat different UK tapwater for a different purpose (fish), the effective life of the cartridge dropped to a tenth of its original American forecasted life for domestic water treatment. This comparative testing showed a potential risk of sending around 1,000 gallons of assumed 'treated' tapwater to the Koi pond which still contained too much total chlorine for Koi if a Koi keeper had assumed that his Koi were protected for 20,000 gallons.

Putting technical data on one side: Tap water purifiers are installed between the tap and the pond. They are only suitable for treating 'new' water before it is sent to the pond for the first time and are not suitable for treating recirculating water (i.e. water that had already been in contact with your fish).

## MUCK COLLECTING

Any garden pond will attract 'muck' at the bottom of the pond and the filters (some people prefer to call it sediment). How does it get there? Sediment can

comprise rotting leaves, uneaten food, fish waste and the soil from plant baskets, etc. Take a few precautions. Cover the pond with netting or scoop leaves from the top of the pond in the autumn. Use gravel with a topping of heavy stones for your plants, not soil. **DON'T OVERTFEED YOUR FISH!**

However careful you are some sediment will collect so you need to plan its removal. If you don't, you risk developing a breeding ground for anaerobic bacteria which damage fish. Your fish will also grub around and stir up sediment creating a cloudy pond. Sediment can be removed from ponds by 'hoovering' (use a purpose-built pond vacuum). Some pumps can sit on the bottom of the pond to 'drag-out' the debris. The easiest way is to use bottom drains. If your pond is already built, or you have a glass fibre pond which prevents bottom drain fitting, then consider fitting a top-bottom drain.

Sediment has to go somewhere. Either use a pump which has foam or a basket to trap the solids (this will need cleaning regularly) or send the dirty water to a 'settlement' chamber or vortex outside the pond.

A settlement chamber is designed to trap the solid wastes. Normally it will be part-filled with brushes. A tap or a drain at the bottom of this chamber allows easy flushing away of the 'collected' dirt. Far easier maintenance is achieved if each filter bay is fitted with a tap or a valve so you can flush the sediment from each individual chamber.

Making it simple to remove the solid dirt easily from the bottom of a pond or the filter bays avoids the back-breaking job of emptying the pond or the filters for cleaning while substituting quick and easy maintenance jobs. This leaves the Koi keeper with plenty of time to enjoy that

interesting glass of something while watching their fish. It is an art being a lazy Koi keeper while looking after your fish well!

## MAINTAINING 'GOOD' WATER

This is the third and vital stage to keep the pond water 'right' for your fish.

When fish eat, 'breathe', swim around, tear your plants to bits and fight for food one of the waste products they produce is ammonia. Unfortunately, ammonia is poisonous. Koi keepers use biological filters to reduce ammonia. Thus you mimic the 'natural' river conditions that Koi (carp) prefer. How do you do that?

After the sediment (solid waste) has been removed from the pond water, the water is sent on to one or more biological filter bays. The filter bay(s) will contain media to 'house' aerobic bacteria.

These oxygen-loving bacteria feed on the ammonia and convert it through nitrite to nitrate which is relatively harmless to your fish. This 'cleaned' water is then sent back to the pond.

If you join a group of Koi-keepers you will find there are ever-continuing arguments as to which is the 'right' type of biological filters: is one tank enough? Should you have a number of different tanks each containing different media? How large should these tanks (or bays) be for your size of pond? How fast should water go through the filters? What is the 'best' filter medium? Should the filters be pump- or gravity-fed? Should you use a vortex? How do gravity-fed filters compare to trickle

tower filters, etc., etc! There is only one answer — the design of the filter is right only if the filter is effective, if it doesn't work — then the design is wrong! Filters can be simple or complex but they have to work!

How do you know whether your filters are effective or not? Pond water test kits are the answer. They should be used to test for ammonia, nitrite, nitrate and pH. Daily readings should be taken for brand new ponds and testing maintained at least once a week for an established pond. You cannot guess what is happening in the pond water, only proper testing (or sick fish!) will tell you. (Test regularly for oxygen in hot weather.)

Useful practical points: Boost new filters by adding live bacteria to the pond on a regular basis for the first few weeks. The bacteria you need in the filters love oxygen, so oxygenate filters as well as the pond. Filters need time to mature and new ponds should be established with a small number of fish — yes I know that new batch of fish at your favourite dealer's are irresistible — but you must keep stocking levels low for brand new ponds. Remember that ponds take about 18 months to two years to mature, they stay 'young' for a long time.

When you are ready to add new fish add one or two at a time. Filters can't snap their fingers and produce extra bacteria out of a hat to maintain 'good' water conditions for an influx of numerous new fish. Treat your filters gently, give them time to catch up with their new work load.

Last tip: Do not send water through the filters too fast with too powerful a

pump for the size of your filters. You could risk two problems: (i) instead of the solid waste particles being trapped, they get ground up into fine particles which return to the pond to cause cloudiness, and (ii) the bacteria will not have enough contact time to feed on the ammonia and reduced its levels sufficiently.

Where do UVs fit into all this? Their sole purpose in a Koi pond is to burst the chlorophyll sacs in single celled algae so the water is clear to look at rather than green. Basically, in this setting, they are of aesthetic use.

The sole aim of treating water for Koi and other pond fish is to give them the best possible 'housing conditions' which encourages the development of strong, healthy fish who can fight off minor health ailments using their own well-developed immune systems. In medicinal terms, it is a case of 'preventative' medicine on the basis that prevention is better than cure.

To summarise: There are three main stages to treating water for garden ponds.

1. Put the 'right' water for fish into the pond. This is equally important when you fill it initially, throw away old water and replace it (hoovering and filter flushing), or when you top-up the pond because some water has evaporated.

2. Plan to trap and remove sediment (solid waste) from the pond and the biological filters.

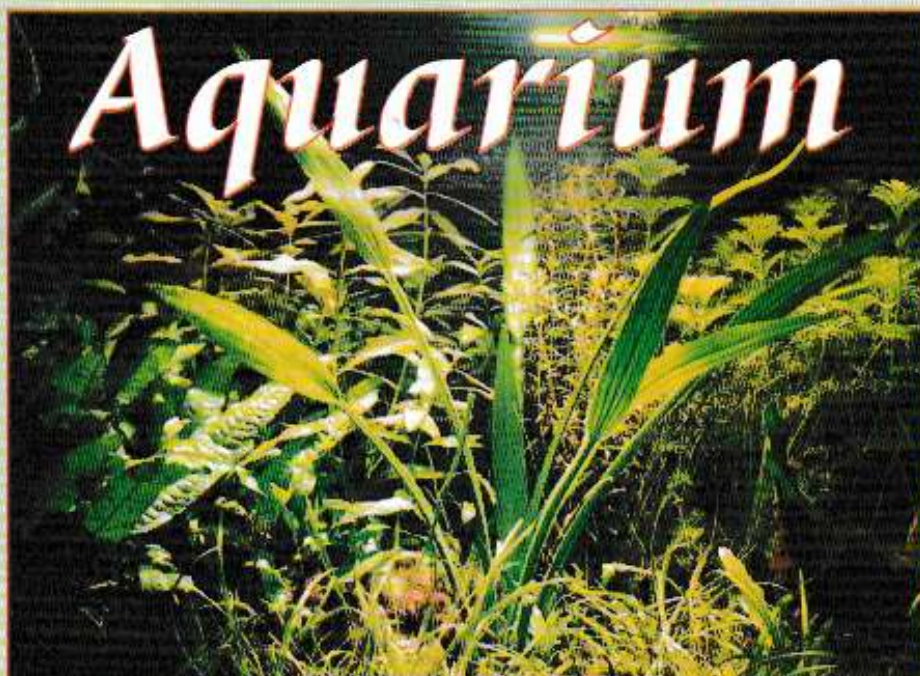
3. Use biological filters to control ammonia, nitrite and pH; in addition, control nitrate levels through water changing and possibly the use of plants (Koi can't reach plants in bog gardens or cascades!)

*Ann Telford is  
Technical Director of  
AllClear Water Purifiers*

TROPICAL

# The Plant-Friendly

# Aquarium



**F**ew would argue that a well planted aquarium provides the perfect backdrop for tropical fish, but many find this difficult to achieve and may find that many text books give little

guidance to the cultivation of aquatic plants. This often adds weight to the expectation that plants only need to be purchased and planted, with little regard paid to their needs. Of course for some this works, plants do flourish for them

without the owner perhaps realising why. Such tanks can be considered 'Plant Friendly'.

Two attitudes often prevail when plants consistently fail, firstly they are not worth the effort as plastic plants look just the

same and, secondly, to grow plants well you need to invest in expensive equipment from the continent including CO<sub>2</sub> systems. Whilst the latter undoubtedly produces excellent results much can often be done to improve an

**CHRIS ROSAM** DEALS WITH NITRATES  
PHOTOGRAPHS BY THE AUTHOR

aquarium's disposition towards plants without spending a fortune.

The reasons for wanting to grow aquatic plants are, I believe, compelling, and include:

- plants oxygenate water in a far superior way to any form of aeration;
- they absorb many of the waste products produced by fish;
- they can assist in the suppression of algae;
- plants provide the perfect and most natural compliment to fish;
- the cover they offer puts fish at ease and lessens stress;
- plants provide natural spawning places and hiding places for unexpected fry;
- researchers believe that plants may secrete antibiotics, which help fish fight off disease;
- when plants and fish alike thrive the aquarist feels a greater sense of achievement and, in general, a plant-friendly aquarium will also be fish-friendly.

Returning to the question of why plants grow in some tanks and not others requires a

recognition of the fact that some of the current 'standard' fishkeeping techniques, whilst undoubtedly being of

benefit to fish, create a hostile environment for any co-habiting plants. An appreciation of the laws that govern the development of

all plants is also useful

## MINIMUM LAW

For any plant to develop, all elements required must be present. The element in the shortest supply will dictate the rate of growth. Some examples are fairly obvious: if a plant receives little or no light it cannot prosper and will die. But there are less obvious examples, perhaps a

trace element may be missing, even though it is only required in the minutest of quantities, its shortage or absence will dictate the rate of growth if ultimately the plant survives.

## PLANT-FRIENDLY WATER

If plant-friendly conditions are to prevail then one has to ensure that water conditions are appropriate.

In nature waters that support good aquatic plant growth are not rich in nutrients or trace elements, but remain constant



MAIN PICTURE LEFT

Plants are often celebrated as consumers of nitrate, but high levels will stunt their growth. The picture shows *Sisking Loaches*.

### ABOVE

Watching the world go by ... instead of eating algae! Sisking Loaches are often chosen for their algae eating attributes, but they grow old and lazy.

### BELOW

Excess nitrate and phosphates can create good conditions for the Bead Algae which can spread at an alarming rate.



in their composition ensuring that neither a shortage or over-supply of nutrients occurs. Such waters are referred to as eutrophic.

With some exceptions most plants prefer soft, neutral to slightly acid water. If your tap water is hard and alkaline it is best to dilute it with clean rainwater or de-ionised water. Aim to modify the water so that the pH is between 6.6-7.0 with a hardness of 2-5 DH. Unless you keep hardwater cichlids or brackish water fish most fish will enjoy these water conditions, especially those from South America and Asia.

When water is over-supplied with a nutrient or nutrients they become super-eutrophic and the normal balance is disturbed and as a result primitive algae flourish and smother aquatic plants.

One nutrient that is often in excess supply is nitrate. Plants are often celebrated as consumers of nitrate, which they are within reason, but concentration of more than 50mg/l also stunts their development.

Most informed aquarists will be aware that nitrate ( $\text{NO}_3$ ) is present in aquarium water as a result of nitrification of fish waste. This process is often known as the nitrogen cycle and occurs due to the activity of aerobic bacteria in the aquarium filter and the aquarium itself.

Nitrate is often thought to be harmless and at a concentration relevant to the type of aquaria being kept it may not cause any apparent problems. Nitrate concentrations within aquariums are often higher than would be the case if the only nitrate present was that caused by the breakdown of fish waste, as our tap water often has already high levels of nitrate within it and most of us use this water for our aquariums.

Nitrate has become an unwelcome addition to our ground and drinking water,

## IDEAL PLANT-FRIENDLY WATER CONDITIONS

**pH** — 6.5-7.0 (slightly acid to neutral)  
**HARDNESS** — soft to moderately hard: 2-6 DH  
**NITRILE** — less than 0.1mg/litre  
**NITRATE** — less than 20mg/litre  
**PHOSPHATE** — less than 0.1mg/litre

*If your tapwater falls within these parameters then you are lucky! If not, then modify the water as suggested in the text. Most freshwater fish will enjoy these conditions, with the possible exception of hard-water Cichlids. If these are your choice of fish then select only hard-water-tolerant plants such as Vallisneria.*

thanks in large part to intensive agricultural use of nitrogen-based fertilisers. For many years the level of nitrate within drinking water supplies increased unchecked, until in some areas it became apparent that these high levels of nitrate presented health problems for the consumers.

In recent years the EEC has issued a directive to member nations that they should limit the nitrate concentrations to 50mg/litre. As the Water Companies and the Government have argued with the EEC that they need more time and a good deal more financial investment to meet EEC standards it may be that your water still has a higher concentration than recommended.

## ALGAE PROBLEMS

High levels of nitrate (and I class this as concentrations of over 50mg/litre for freshwater aquaria), also gives rise to the risk of algae blooms, particularly pernicious types, such as the Blue/Greens and Beard algae. The former will quickly cover the aquarium in a slimy layer, covering gravel and rocks and will suffocate any plants already struggling to survive due to

high nitrate and it also makes the water smell foul.

Beard algae can also grow out of control, covering decorations, rocks, etc, with tufts of unattractive grey/black fibres.

In my view nitrate levels, irrespective of the type of aquaria, should be maintained at concentrations below 20mg/litre.

## NITRATE REDUCTION

If you find it necessary to dilute your water with de-ionised or clean ran water, this measure alone may fortuitously lower nitrate levels to that recommended. If high levels of nitrate still persist then nitrate removal systems could be employed, but their long term use can be expensive. Another solution is to look again at the way we filter our aquariums, and the 'nitrogen cycle'.

The conversion of fish waste by aerobic bacteria, via nitrate to nitrite ( $\text{NO}_2$ ) is well understood.

The prerequisites to this process are a large surface area for bacteria to colonise, oxygen and of course the presence of the bacteria. This subject is well documented and I do not intend to cover the subject

again.

To speak of the nitrogen cycle being the conversion of waste to nitrate ( $\text{NO}_3$ ) is only really half the cycle. As is suggested by the term 'cycle', the process should return to its origin. The conversion of waste to nitrate is the half of the cycle known as nitrification. The second half of the cycle is a de-nitrification where the nitrate molecules are converted back to their composite parts — nitrogen and oxygen gases. If nitrification and de-nitrification could be established in the aquarium, we could prevent high levels of toxin from fish waste and high levels of nitrate. In reality this is relatively easy to achieve.

All that is needed is a canister-type power filter and suitable filter media.

Within the filter we need to set up an area to carry out both aerobic and anaerobic bacteria. The latter of these is rarely heard of in a good light. Anaerobic bacteria thrives in areas of low oxygen, and it is this type of bacteria that is blamed when stagnant substrates start to rot and foul smelling bubbles rise. But they can be used to our advantage.

To establish anaerobic zones we need a filter media which offers a large surface area, a good food supply and low oxygen levels in the water. The anaerobic bacteria still requires oxygen and provided that levels are low the bacteria will extract oxygen molecules from nitrate and via conversion through nitrite to nitrous oxide (laughing gas) to nitrogen gas, the nitrate will be greatly reduced. The nitrogen gas will be exhausted from the filter and escape to atmosphere. When a filter is operating in this manner it is said to be operating reductively.

To create low oxygen zones in a canister filter, foam is the best medium as it provides a large surface area and a slow water path across it. The foam needs to

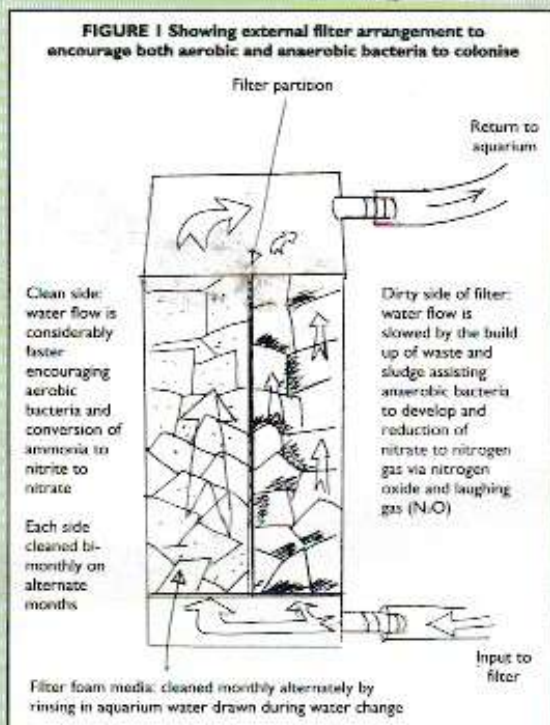


become dirty to provide a food source for the bacteria and the pH should be neutral to slightly acid, as already suggested for plant-friendly conditions.

At the same time the filter must continue to operate as a haven for both aerobic as well as anaerobic bacteria. To ensure this the filter needs to be divided vertically with a divider (see Figure 1).

In each side of the divider a foam within filter bag is inserted. As much foam as is possible without undue crushing should be inserted. Once the filter is run initially the filter will operate mechanically only, then firstly aerobic bacteria will colonise and later when the filter is starting to become dirty and the flow is slowed anaerobic bacteria will develop. After having run for a month or two one side only of the filter should be cleaned. This should be done by rinsing the foam media in a bucketful of freshly-drawn aquarium water, thus preventing all the useful bacteria being destroyed.

Each side of the filter is then cleaned alternately, ensuring that the clean side operates mainly aerobically and the dirtier side anaerobically.



pipe is placed into one end of the 'U' column and an elbow attachment is fitted at

the other end, just above the top of the tank level.

The 'U' tube is then filled

with a porous filter media, so as to provide as large a surface area as possible.

The airline is then fitted/adapted to fit the outlet of the filter. The filter then forces water down the airline pipe, which passes through the 'U' tube and drips out the elbow attachment back into the aquarium.

The water flow is slow and once anaerobic bacteria is established, then denitrification occurs.

It should be noted that anaerobic bacteria may not establish as quickly as its aerobic counterpart.

## OTHER BENEFITS

If the principles of maintaining a neutral pH and diluting tap water are followed other benefits will also occur. For instance, fish waste first appears as ammonia and ammonium ( $\text{NH}_3$  and  $\text{NH}_4$ , respectively). Ammonia is a far more toxic substance than ammonium and the ratio in which they appear is pH-dependent: at neutral to slightly acid levels more ammonium appears, but as the water becomes more alkaline the ratio favours the more toxic ammonia.

Ammonium is also absorbed by plants as a nitrogen based fertiliser, and thereby removed from the nitrogen cycle, leaving less to be converted to nitrite and subsequently to nitrate.

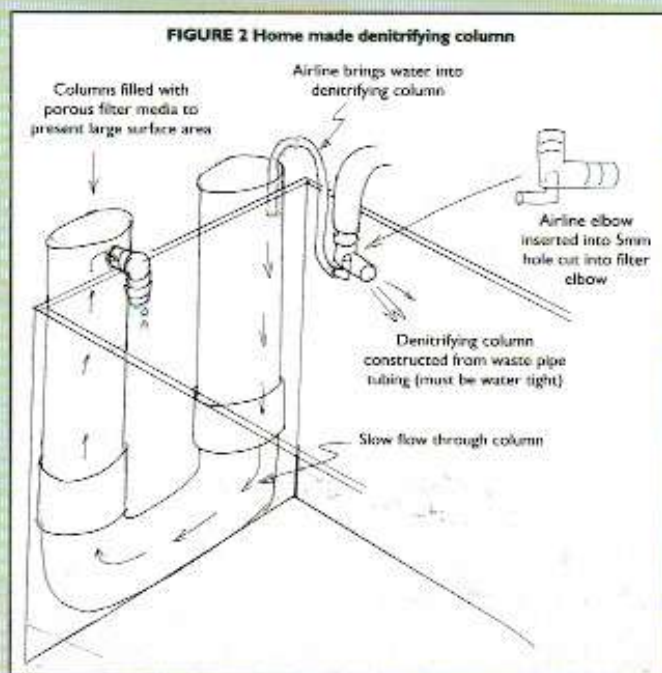
The second principal advantage of diluting tapwater is the lowering of phosphate levels if these are present. Phosphates are another symptom of modern agriculture and, although another basic plant food, they are not welcome in excess. If they are, algae problems can be expected and, like nitrates, high levels can stunt plant growth.

## HOME-MADE DENITRIFICATION COLUMN

If the filter cannot be partitioned or you use an internal power filter you can construct and use a denitrifying column (see Figure 2).

This consists of a 'U' shaped column made of 1in or 1.5in plastic plumbing pipe. The tops are left open and made 3in higher than the water level. The 'U' column is placed next to the aquarium.

A piece of air line



# Making a Bog Garden

**T**he surroundings of a garden pool are as important as the pool itself. Suitable marginal and edging plants set off a pond well and help it to blend in with the rest of the garden. One attractive way of doing this is to make a bog garden.

Many plants like to grow in wet soil without actually standing in water. Some of these are very attractive, with colourful or interestingly shaped flowers or foliage. Even if you do not have a garden pool it is worth considering making a bog garden to grow some of these varieties. It is certainly a safer — albeit messy! — alternative to a pool if you have young children.



*Galba pabonis*  
PHOTOS BY FRANCESCA HILLS

Another reason for making a garden marsh is because of concern about rural wetland habitat loss. Swamps and marshes support some of Britain's most beautiful and rare wild flowers, food plants for bees, butterflies and other insects.

Marshlands also provide shelter for adult frogs, toads and newts who hide amongst damp vegetation much of the time, emerging at night to feed on slugs and snails. Song thrushes, swallows and house martins need mud, laboriously gathered from marshy ground and pond edges, for building their nests.

Marshes are also sources of mosses and liverworts, used by many birds in nest building.

All these species have been declining alarmingly in the countryside, due partly

**JOSIE BRIGGS SHOWS HOW TO  
CONSTRUCT YOUR OWN  
GARDEN MARSH.**

## POND Making a Bog Garden

Alternatively, use a continuous piece of butyl rubber liner for both pond and bog. Construction is similar to building a pond, digging a hole up to about 45–60cm deep in the centre. When the liner is in place, fill it with soil. The pond water is allowed to overflow into the bog, but there should be a barrier between the two to stop the bog soil slipping into the pond. This could be a row of smooth stones, for instance, or an old railway sleeper.

A stand-alone bog garden is made the same way. Dig out the area with gently sloping sides to 60cm deep in the centre; no shallower or the soil will dry out too quickly in summer. The main problem here is keeping the soil wet without a nearby pool to feed it. In dry seasons it may need topping up regularly with water, preferably from a rainwater butt to avoid contamination from dissolved minerals in tap water. If your marsh is near to house or another building, rainwater from the guttering can be directed into it.

Although marsh plants need permanently moist soil, most are unhappy if it becomes stagnant and airless. If waterlogging becomes a problem in a stand-alone marsh, it may be necessary to pierce the liner at intervals with a garden fork to make it porous.

### PLANTING

There is a large choice of beautiful marshland flowering plants suitable for a bog garden. Many are annuals and biennials, whose seeds germinate readily in



ABOVE *Calla palustris*  
PHOTO: KEITH LAMBERT

BELOW *Pontederica cordata*  
PHOTO: KEITH LAMBERT



wet soil. Some of the perennials are rather vigorous, but confining them in a bog garden prevents them from

spreading into the rest of the garden.

The best time to plant up a bog garden is April or early May, but container-grown plants can be planted any time.

Many wetland plants can be grown from seeds. These can either be sown directly or, preferably, germinated in seed trays or small pots to give them a good start before planting out. Needless to say, the seedlings and young plants must never be

allowed to dry out.

Plants look good if set in groups and drifts of each variety. As for any other garden bed, plants can be selected for seasonal or year-round interest. Colour themes can be used; for instance, clusters of pink candelabra primulas with red, pink and white feathery plumes of astilbes give a pretty summer display.

Depending on the varieties grown, bog garden perennials need thinning and dividing every one to three years. Large clumps of vigorous plants such as yellow flag tend to die off in the centre and produce less flowers; these can be lifted, then young shoots around the outside of the clump are cut off and replanted to renew the plants. This is best done in late spring when the plants are growing strongly.

The bog garden will need to be weeded occasionally to keep grass and other invaders at bay. Herbaceous perennials can be cut back in autumn to prevent dead leaves from decaying and souring the marsh. Feeding is generally unnecessary.

Koi

# Single Coloured Koi



**NICKY CHAPPLE** KEEPS IT SIMPLE THIS MONTH, WITH ONLY ONE  
COLOUR AT A TIME TO DEAL WITH  
PHOTOGRAPHS BY THE AUTHOR

KOI  
Single Coloured  
Koi

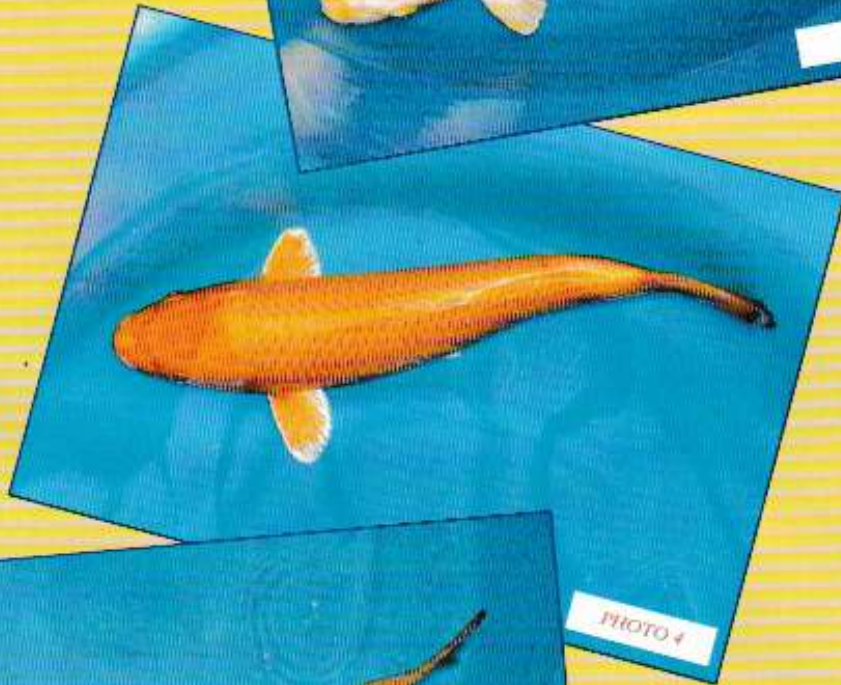
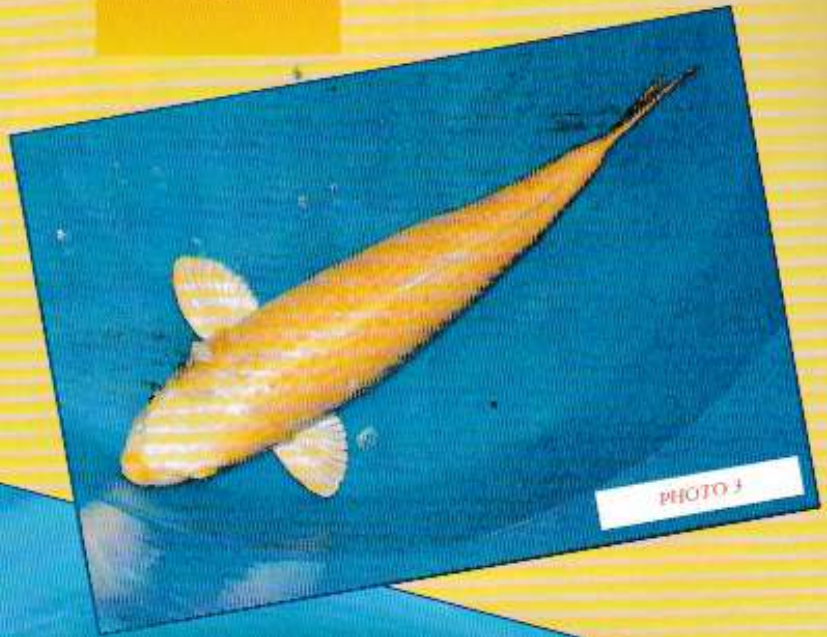


PHOTO 6



PHOTO 7



## Tetra COMPETITION

# *TetraTec Filters — so advanced they're simple*

Tetra prides itself on providing the highest quality equipment, foods and treatments for fish, so it is no surprise that the new range of TetraTec Internal Filters not only live up to high standards, but are also extremely easy to use.

TetraTec 'easy clean' filters are extremely easy to maintain — there is no need to remove the whole filter unit from the aquarium as Tetra has developed a filter cartridge containing the foam media which can easily be removed for cleaning. This simplicity extends to the impeller which can be removed, cleaned and replaced in a few seconds, without removing the entire filter.

Added to this the filters feature an air intake tube, an airflow adjuster which alters aeration, a multi-directional water outlet to ensure good water circulation, and a flow rate adjuster, enabling the flow of water to be tailored to

suit any specific conditions required in the aquarium. As with all TetraTec products the filters have a sealed plug and extra-long cable for ease of use.

Available in four models there is a filter available for every size aquarium: IN400 for aquarium size (litres 30-50), IN600 (50-100), IN800 (80-150) and IN1000 (120-200).

This month Tetra is giving away two models — the IN400 and IN600. To win send your answer to the question below on a postcard or sealed envelope to: Dept INTF, PO Box 2162, Bournemouth, BH2 5ZA, stating which model you would like to win. Entries must arrive no later than 10 August 1997.

**Question: WHY ARE THE NEW TETRATEC INTERNAL FILTERS SO EASY TO MAINTAIN?**

## KOI Single Coloured Koi

**T**o some the thought of a single-coloured Koi might appear boring — but nothing could be further from the truth.

Koi, traditionally, have been bred to be viewed from above, so that you look down on them to appreciate their patterns. However, nothing is more important than the shape or confirmation of the Koi. In showing terms body shape is approximately 80 per cent of the judging criteria (a bit like Miss World!) A Koi with a pot-belly, kinked spine or one with a swim-bladder problem would do very badly in a show.

Males and females are slightly different in body shape in that males tend to be longer and thinner more of a cigar shape — whilst females are more voluptuous, rounder and, if viewed from the side, have a 'tummy'. It is interesting to note that as far as showing is concerned females are more popular than males because their larger volume makes them more impressive on the eye — and also makes them more expensive to buy!

In plain English, on a single-coloured Koi it is easier to appreciate body shape, grace and movement without the distraction of pattern.

Single-coloured Koi basically fall into two main sections — non-metallic (or matt coloured) fish and metallic Koi.

In Koi keeping there is a very famous phrase that is 'Koi keepers start with Kohaku and end with Kohaku'. Kohaku are white Koi with red markings. In the last 12 years of selling and keeping Koi this has never been my observation as most Koi keepers normally do not want to keep Kohaku in the beginning because 'the look too much like Goldfish' — the majority start with the single-coloured metallics.

Let's start with these or, as these are more commonly called, Ogons. These are a very impressive sight in any pond. When looking to buy any single-coloured Koi the first criterion must be that the colour of the fish from head to tail is the same hue. Also very important is that there is no inference of black in the head as this shows poor quality. A single-coloured Koi should mean just that: note also that even the fins are the same colour as the body and head.

Ogons are highly metallic and available in many different colours and shades of colours. One of the most popular is the Parachina, or Plammun Ogon, literally being silver all over. It's good to have a Parachina in a pond as they are so bright, a positive highlight to the pond and they also have the effect of showing off the colours of the other Koi as they swim over, or beneath, them.

The most important aspect of single-coloured Koi (which is more important on these fish than on any other variety), is that of scalation.

Most Koi are scaled all over the body, as in Photograph 1. So, if a single-coloured Koi is damaged or has a hole it is useless for showing because it is an obvious flaw and spoils the overall symmetry of the reticulation of the scales, which is of paramount importance because there is no pattern.

However, another scalation type that is very popular in Ogons is the Doitsu scale pattern shown in Photograph 2. Doitsu means skin and scale and on this fish you can see the scales along the dorsal line; Doitsu scalation is popular because it has the effect of enhancing the colour of the

Koi even more and makes it appear even brighter and crisper.

As we mentioned earlier Ogons come in many colours, the next most popular being Yamabuki Ogon (Yamabuki literally means yellow in Japanese). Good specimens of this variety are highly sought after, they can vary in colour from the palest yellow through to dark gold. In Photograph 3 you will see that this is not the highest quality specimen because the colour is not even all over (notice it is darker around the nose) and the lustre is dull in comparison to the Parachina in Photograph 4. Photograph 5 shows an Orenji, or orange, Ogon, which is another popular variety.

After the highlights of the single-coloured metallic Koi — Ogons — come the low lights necessary in any pond to keep the balance of colour interesting.

The most popular of these is the Chagoi. Chagoi are single-coloured matt brown fish (Photograph 6). In fact, the literal translation of 'Cha' is brown — as in 'cup of cha' (tea) — and 'goi' means fish.

Initially hobbyists can think these fish look boring but what a Chagoi lacks in colour and pattern it makes up for in personality.

These fish tend to be the 'life and soul' of most ponds; they tend to be VERY friendly and so encourage the other fish to be the same. They are very easy to tame and grow very quickly because they have huge appetites. Chagoi are very strong and incredibly hardy in comparison to the other varieties. What is particularly noticeable on Chagoi and which adds to their elegant simplicity is the reticulation of the scales shown

beautifully in the photograph.

In colour Chagoi can be anything from pale beige right through to chocolate (see Photograph 7). But, when you are buying, consider the water temperature as in winter Chagoi are much paler than they are in summer.

In Photograph 7 you can see another scalation variation on a Chagoi and that is Gin Rin scalation. Gin Rin scales are shiny (Gin means silver) so the literal translation is silver lights. However, while there is a metallic light to the scales the fish itself is not metallic, but still matt in colour. This photograph also shows how different the colours on Chagoi can be. Also shown are the single coloured, yellow, fish known as Kigo. These are traditionally the colour of Lemon Card.

Notice how different they are to the Yamabuki Ogon. Seeing these together it is easy to understand the differences between metallic and non-metallic single-coloured Koi.

Kigo are not so easily available as Chagoi and are not at all impressive when young, but a large pure Kigo is a beautiful deep colour and is very desirable as yellow fish can be the albinos of the carp world, and some have red eyes the colour of rubies.

Of the other non-metallic, single-coloured Koi that we have not mentioned so far include the Magoi — which is the original carp all Koi were bred from, which is black in colour; the Benigo which is orange in colour; and the Soragoi which is slate-grey, or blue, in colour which is particularly attractive with Gin Rin scalation.

All in all I hope this has explained the difference between metallic and non-metallic single-colour Koi and made it easier to appreciate how important body shape is to the overall elegant of ANY Koi.

# 'Cryptic Callionymids'

**NICK DAKIN** LOOKS AT THE FISH WITH  
'FLOWER POWER' COLOURATIONS  
PHOTOGRAPHS BY THE AUTHOR



Mandarinfish, *Synchiropus splendidus*.

**M**andarinfish, of the Family Callionymidae, are highly popular fish with both the

marine fishkeeping fraternity and those who just happen to admire saltwater aquaria. It is easy to understand why when one considers their cryptic patterning and elaborate colouration,

especially as it is merged with such a curious, but nevertheless very attractive shape. Another attractive feature of this fish is its ability to 'hover' just above the substrate, courtesy of a pair

of swifly wavering pectoral fins. However, despite being a beautiful and desirable fish their aquarium requirements are rather specialised and some caution must be exercised before purchasing.





Scooter Blenny, *Petrosaurus tinnimus*.

## DRAGONETS

Dragonets form a small family of bottom-dwelling scaleless fish that are to be found in all the shallow tropical and temperate oceans of the world. However, for the purposes of this article we are highlighting the two Mandarin fish to be found in this family — The Mandarinfish (*Synchiropus splendidus*) and The Psychedelic Fish (*Synchiropus picturatus*).

A cursory glance by the inexperienced eye might confuse the two species but a more careful examination will reveal obvious differences in the intricate colour and patterning. In their natural habitat of rocky outcrops, sandy substrate and mixed algal growths these cryptic markings are an essential part of their camouflage.

Potential predators find the fish difficult to locate and even if they do Mandarinfish have an extra line of defence; a toxic slime that can be exuded from their skin which serves as a distasteful distraction to an aggressor, enabling the Mandarin to escape from the scene of the confrontation.

## FEEDING — WILD AND AQUARIUM

Despite a preponderance for living amongst areas of algae, these are not herbivorous fish; they live on the micro-organisms, crustaceans and small worms that inhabit these areas. Once the Mandarin has sighted a potential meal it is attacked with a peculiar pecking/sucking action. Once in the mouth any unpalatable matter is ejected through the gills. Mandarinfish are continuous

browsers and it is essential that any aquarium in which they live should be well-established in order to ensure a plentiful supply of the micro-organisms so essential to good health. Newly set-up aquaria are rarely able to supply the quantities of food and Mandarinfish tend to fare very poorly in such an environment, and as such are not recommended as a first addition.

Brine Shrimp and Rotifers that settle on the substrate are eagerly taken (unless 'robbed' by other

tankmates) and they are stocked by many reef aquarists to predate upon nuisance flatworms.

Unfortunately most Mandarinfish find these pests as distasteful as many other fish and refuse to be tempted. Whilst a few individuals may develop a partiality for small quantities they should not be relied upon to clear an aquarium suffering from this particular type of infestation.

At this point it has to be stated that most Mandarinfish do considerably better in a reef aquarium. Fish-only tanks can rarely supply enough micro-organisms on which these fish thrive and supplementary food introduced by the aquarist is usually taken by other, more active, fish.

## SEXING

It would be true to say that establishing the sex of the majority of marine fish can be a very difficult, if not impossible, affair. Not so with Mandarinfish; pairs are easily identified by referring to the dorsal fin of any individual. The male of both species has a clearly extended first dorsal spine, while the female does not. This may not be immediately obvious until



Psychedelic Fish, *Synchiropus picturatus*.

the dorsal fin is raised from its normal resting position close to the body. Once it is there can be little mistake.

## PAIRING UP

A male and female of either species will peacefully occupy a reasonably roomy aquarium. However, two males of the same species are likely to fight and are best housed separately. Curiously enough, a pair each of *S. picturatus* and *S. splendidus* can share the same aquarium in perfect harmony and frequently fail to recognise the presence of each other, even though so closely related.

## MATING

Mandarinfish housed in a suitable aquarium are frequently to be observed performing their graceful courtship display. This involves a pair gently rising in the water column, abdomen to abdomen, while simultaneously shedding eggs and sperm. These actions often take place at twilight and are frequently repeated on consecutive evenings while there is still enough illumination. It should be stressed that mating rituals are rare in tanks where there are unsuitable tankmates, insufficiently 'private' areas, or where space is limited.

The eggs from captive matings rise to the surface as they would in the wild but, as yet, successful rearing has proved elusive.

## THIN MANDARINS

Being continuous browsers any delay in shipping will cause individuals to develop pinched-in flanks due to a lack of food. Such fish will require a period of intensive feeding for them to regain a plump, healthy appearance once more. Unfortunately, the mortality rate of such individuals is quite high

## MARINE Mandarinfish

unless given the correct attention. Only specimens displaying a rounded abdomen can be recommended and this must be given particular attention by a prospective purchaser.

## SLIME

We have already seen how Mandarinfish shed toxic mucus in the water to deter predators, and this behaviour is carried over to the aquarium if bullied by unsuitable tankmates. However, it is more likely that the mariner will notice the slime in the bag when a specimen is brought back from a retailer. A rough journey can stress the fish enough to cause it to shed its mucus. Should this be observed, remove the mucus with a syphon and then proceed to introduce the fish in the usual way.

## WHAT SIZE?

Both species of Mandarin are capable of attaining 10cm (4in), or slightly larger. A fish of this bulk requires copious amounts of food, which the average aquarium just cannot provide. Fully-grown specimens usually fail to survive for long periods because they are old and coming to the end of their lives anyway. It is far better to choose juveniles of about 3.75cm (1.5in) which are easier to accommodate food-wise and will survive far longer.

## KEEP COVERED

Many a Mandarin has met a dry and dusty end having leapt from its aquarium. When they are disturbed at night, or in the throes of passion, heading for the

surface of the water seems to be a natural (and ultimately fatal) reaction! Avoiding the loss of an individual completely will require that the tank is fitted with cover-glasses. As most reef tanks have dispensed with these the occasional loss of a fish seems almost inevitable — distressing as it may seem.

## IDEAL CONDITIONS

Callionymids require good water conditions with suitably reserved tankmates. Optimum water parameters are as follows:

Ammonia & nitrite — zero  
Nitrate — less than 25ppm  
pH — 8.1-8.3

Temperature — 25-26°C  
(77-79°F)  
Specific Gravity — 1.021-1.025  
Dissolved oxygen — 6-7ppm  
Water changes — about 20 per cent every two weeks  
Water circulation — brisk.  
Activated carbon and protein skimming as standard  
Lighting — Mandarins largely frequent the shadier areas of the aquarium, although they will tolerate most types of lighting

## HEALTH

Fortunately, when provided with excellent water quality Mandarins are rarely prone to any diseases. Newly imported specimens can sometimes exhibit a few growths of Lymphocystis on the fins, but these need not cause concern and tend to disappear within a few weeks.

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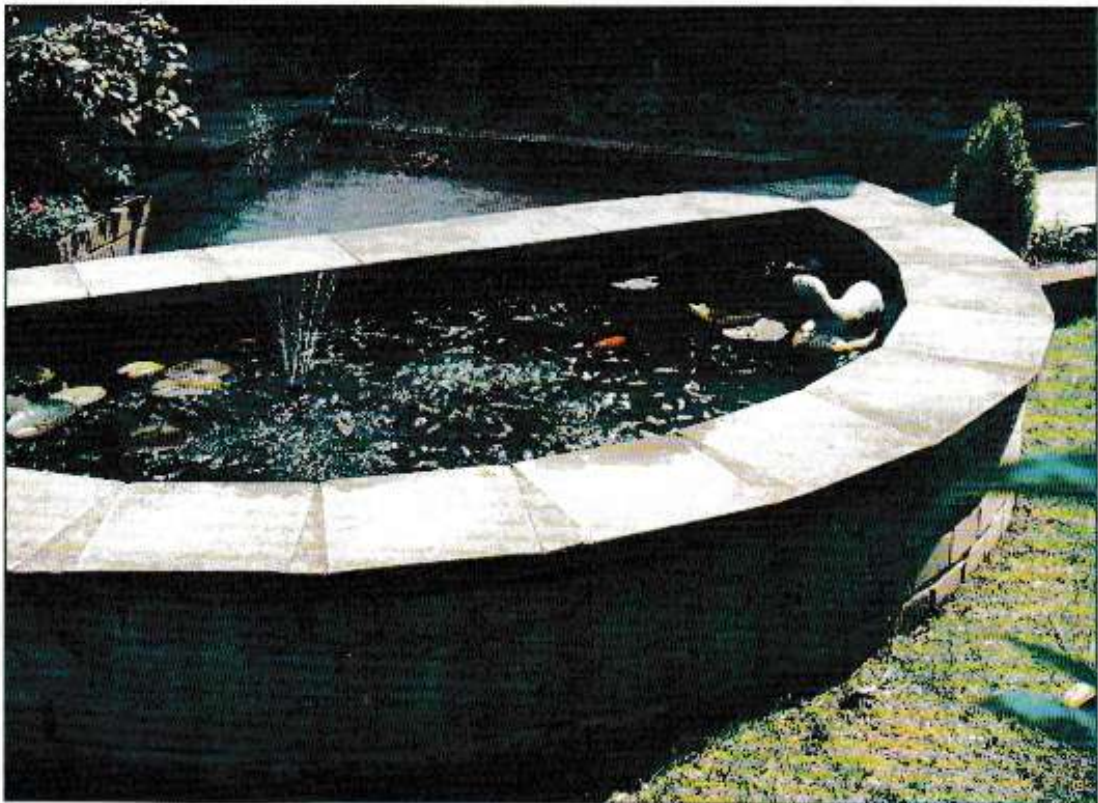
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# *Keep Your Pondkeeping Safe and Secure*



POND  
Keep Your  
Pondkeeping Safe  
and Secure

**STEPHEN J. SMITH SAYS PRE-PLANNING IS THE KEY**

PHOTOGRAPHS BY THE AUTHOR

**K**eeping a pond is a pleasure — or certainly should be! But, every year, any number of accidents happen around the pond which serve only to discourage would-be pondkeepers from participating in this most enjoyable hobby. However, with a little pre-planning and by paying attention to safe practices around the pond, there is every reason to assume that your pond will be a safe, enjoyable, and secure feature for everyone —

young and old — to enjoy.

**CHILDREN**

One of the most common reasons I hear from people who shy away

from installing a pond is that they are concerned that their children/grandchildren/friends' children will fall in. While there are, I realise, a very small number of cases of injury (or, tragically, worse) from small children falling into a

pond, there are literally thousands more youngsters who enjoy a water feature and who are able to avoid such tragedy. Indeed, ironically, children who are encouraged to indulge their curiosity for water and the mysterious life within it under close supervision are less likely to fall foul of accidents, while at the same time learning respect for the water and its potential hazards.

Close supervision is the key. Very young children are unsteady on their feet and would need to be very closely supervised. Just as

**MAIN PICTURE ON PAGE 58**

This simple ornamental pond is constructed above ground and is both attractive and reasonably safe against youngsters falling in.

**BELOW**

My own Goldfish rearing ponds are covered with nylon mesh stretched over wooden frames, while a rustic pergola is an attractive and effective method of deterring herons.



## POND Keep Your Pondkeeping Safe and Secure

in no way would any responsible person allow a child to wander freely near a main road, then similarly no responsible parent would allow their children to venture near a garden pond without, at very least, a close, watchful eye. Of course, as children get older and their respect for the pond is developed, then the extent of supervision can be moderated.

### POND DESIGN

The design of the pond can also help significantly. I would always encourage people to have a pond as part of their garden scheme and, if this is constructed with the water-level above ground, it is unlikely that anyone will fall upwards into the water. As a further safety measure — and one which can also be very attractive — the walls of the pond can be constructed as a 'double skin' so that the space between can be used to plant slow-growing conifers, bedding plants, Hostas, or whatever takes your fancy, thus forming a further barrier. Of course, an additional benefit of constructing a raised pond is that this requires less digging — a pond which is 4ft deep yet raised 2ft above ground level requires only 2ft of digging! Additional measures which can be taken to enhance the safety of the pond is to fence it off or site it in an area which itself is fenced off or divided from the rest of the garden. Or an alternative to a pond itself is to choose a small water feature.

### ELECTRICITY AND WATER

It bears repeating —

electricity and water do not mix! If you wish to install electrical accessories seek the advice of a qualified electrician. This could save your life! The use of low-voltage equipment, such as pond pumps and lighting, will help to reduce risks, and low-voltage pond pumps are every inch as powerful as their mains counterparts. If you decide to use a mains voltage pump try to ensure that it is manufactured to approved UK and European safety standards, while I would also strongly recommend that you use a residual circuit device (RCD). Keep water away from any connections by ensuring that waterproof unions are used, and that switches and junction-boxes are also waterproof and of the appropriate type. Switch off the power supply EVERY TIME you undertake any maintenance or repair, and check your equipment regularly, ensuring that repairs and replacements are carried out as soon as any fault is detected. These may be strong words but you simply cannot afford to take any risks — the idea is to enjoy your pond in safety.

### POND AND WATER TREATMENTS

All pond and fish treatments carry labels which provide detailed instructions on their safe use and handling. Naturally you should keep treatments in a safe place and, when using treatments, always read the

instructions first and do not be tempted to overdose the water with treatment. It is also inadvisable to mix treatments simultaneously, and do please ensure that you wash your hands thoroughly after handling fish and/or chemicals.

### PROTECTING THE POND FROM PREDATORS

Cats and herons seem to be the most prevalent form of predators to the garden pond. But don't rule out other forms of wildlife — my own pond has (thankfully) escaped the visit of the heron — but not, unfortunately, repeated visits from the neighbourhood magpies which, it seems, scoffed my Goldfish fry; nor even a grass snake which must by now be the biggest of its kind in the Midlands!

Neighbour's cats are the scourge of my garden, too, and have been known to select only my favourite Fancy Goldfish for their supper! So, the most effective way to protect the pond from predators (the snake presents rather a problem still, however) is to cover the pond with black nylon mesh. This can be stretched over a wooden frame or pegged directly over the pond. Although not particularly attractive this provides the fish with a most effective protection against cats and birds. It is thought that herons will wade into your pond, though this isn't strictly true. Some hobbyists have found that an effective deterrent is to

string fishing line above the pool area, 2 or 3ft apart, while others have found that a 'trip wire' around the pond is equally effective. My favourite method is to construct a pergola over the pond area, which not only protects the fish from predators but also provides an attractive framework for climbing plants, such as Clematis and Wisteria, for example.

So far, all of my thoughts and practical ideas for pond safety and security have been founded on tried and tested solutions coupled with commonsense experiences over the years but, of course, nothing stands still; today there are many ideas for safeguarding the pond and surrounding property.

For instance, heron-scapers may range from the simply elegant 'shishiodoshi' to infra-red scanning movement-detectors which can then switch on all manner of deterrents from electronic dog barks, loud explosions to well-aimed jets of water. Some ponds may be protected with mini-electrified fences (not quite guaranteed to make cats' fur stand on end) whilst for safe-kid insurance there is even a 'ripple-detector' which floats on the surface to detect any disturbance creating by bodies falling into the water — I wonder how it reacts to early morning spawning activity?

### FINALLY ...

There is no need to think that pondkeeping is a dangerous hobby. With a little care it is something that you — and your family — will enjoy safely and securely.

This month water temperature will be at, or near, its maximum for the year and many of us will find ourselves spending evenings sitting on the lawn or patio, watching our Koi meander around the pool.

A glass of wine in hand to refresh us after a days work; what could be better?

Alternatively, you may find yourself spending time on pond maintenance or maybe even digging another one. This is all part of the Koi keeper's pleasure. Whatever the situation, this is the time when seeing Koi eagerly feeding is a pleasure and even if you are still teaching your Koi to take food from your hand I am sure you will find mental as well as physical relaxation.

For those wishing to try hand feeding I offer the following tips. Have patience, sit quietly at the pool-side and do not move the hand once it is in the water, ie, let the fish come to the hand, not vice-versa. Hold the food (we were advised to start with Cockles and found them to be very acceptable to our fish) between forefinger and thumb with the other fingers curled up into the palm. Your Koi may approach and turn away at the last moment causing disappointment, but persevere. If at any time you want to take your hand from the water please lift it straight out very slowly to avoid frightening the fish and thus having them bumping into each other or, worse, into the pond walls.

This procedure may take several attempts to be successful and you should not hold onto the food for too long. In these early stages it may be wiser to let the food go when a fish is within an inch or so of your fingers as a reward for coming to the hand. Do not be frightened yourself. Even the smallest of Koi have a strong sucking ability and will often suck your fingers or the back of your hand rather than take the food. Do not take the hand away quickly when this happens as you will only frighten the fish and set the process back a day or two. You should come to no harm because Koi do not have teeth at the front of the mouth. They do, however, have three rows of pharyngeal teeth at the rear of the mouth for crushing food. Have patience and I wish you 'happy hand-feeding'.

Hand feeding aside, these summer months are when I am particularly careful about the regularity of feeding. It is essential that a fairly constant load is placed upon the biological filter in order to keep water quality at its highest. I use a plastic tub to ensure that the same quantity of food is given each time rather than giving 'handfuls' of varying quantity. Don't forget to make the water test kit earn its keep by checking all the usual parameters at least once a week.



## DAVID TWIGG'S KOI CALENDAR

The weekend of May 10/11 saw Lyn and I travelling across country to the Norwich Section BKKS Show. This, their first Open show, turned out to be a very successful weekend and certainly Lyn and I enjoyed it very much. Apart from seeing some lovely Koi in both exhibition and dealers' vats we purchased some excellent value Acer and other plants for our newly rearranged rear garden. A full report follows next month.

## Koi Meetings in July

- 2 Leicestershire Section BKKS.** Meet at Kirby Muxloe Sports Club. Contact Ray Dunkley, 0116 2771600.
- 6 Mid Somerset Section BKKS.** Social evening & BBQ in Langport.
- 8 Nottingham & District Section BKKS.** 'Open Forum'. Meet at the Western Club, Hillside, Nottingham. Contact Shirley Hind on 0115 981 0923.
- 9 South Hants Section BKKS.** Meet in Denmead Church Hall. 8pm. Contact George Rooney on 01420 473169.
- 11 Merseyside Section BKKS.** Alan Findlay is the speaker at The Broadway Country Club, Norris Green. Contact Phil Adamson on 0151 287 9911.
- 12/13 Central Section Open Show.** Pavilion Garden Centre, Shipley, Wolverhampton.
- 13 Northants Section BKKS** entertain Mid Lincs Section BKKS. Contact Albert Day on 01604 407361.

- 13 Mid Somerset Section BKKS** entertain members from Birmingham & West Midlands Section BKKS.
- 13 Avon Section BKKS.** Mid Staffs Section visit Avon ponds. Contact Sandra Lane on 0117 9491061.
- 13 Nottingham & District Section BKKS** entertain Peterborough & Cambridge Section BKKS members at Nottingham ponds. Contact Shirley Hind on 0115 981 0923.
- 14 Northants Section BKKS.** Meet at Saints Sports and Social Club, Northampton. Contact Albert Day on 01604 407361.
- 19 Leicestershire Section BKKS.** Evening pond visit. Contact Ray Dunkley, 0116 2771600.
- 20 Essex Section BKKS Open Show.** Aveley Sports Ground, Aveley, Essex.
- 20 Northern Koi Club.** AGM at George Carnall Leisure Centre, Urmston, Manchester. Contact Tony McCann on 0161 794 1958.
- 20 South Hants Section BKKS.** Visit Worthing Section Ponds. Contact George Rooney on 01420 473169.
- 26/27 East Pennine Section BKKS.** Open Show at Wentworth, South Yorkshire.
- 27 Northants Section BKKS.** Trip to see Wirral Section BKKS ponds. Contact Albert Day on 01604 407361.
- 27 Mid Somerset Section BKKS.** Trip to Birmingham & West Midlands ponds.
- 27 South Hants Section BKKS.** Entertain members from South Devon Section. Contact George Rooney on 01420 473169.

## Koi Shows in 1997

### AUGUST

- 9/10 British Koi Keepers Society National Show Koi '97.** Open Show at Billing Aquadrome, Northampton. Contact Lou Jackson on 01322 463669.
- 30/31 Ireland Section BKKS.** English Style Open Show at Hillmount Nursery Centre, Gilnahirk, Belfast.

### SEPTEMBER

- 6/7 South of England Koi Club (ZNA).** 3rd Open Show (Japanese Style) at Botley Park Hotel & Country Club. Contact Tony Price on 01705 261085.
- 7 Leicestershire Section BKKS.** Closed Show at Farmworld, Gartree Road, Leicester. Contact Ray Dunkley, 0116 2771600.
- 13/14 ZNA North of England Chapter.** 2nd Open Show (Japanese Style) at Avesta Sports and Social Club, Bawtry Road, Sheffield. Contact John Timmis on 01226 289507.
- 13/14 Mid-Somerset Section BKKS.** Closed Show. Part of the Countryside Cavalcade, Mendip Hall 2, Royal Bath & West Showground, Shepton Mallet.

### OCTOBER

- 18/19 East Pennine Section BKKS.** Autumn Open Show. Indoors at the Heritage Centre, Elsecar, Near Barnsley.

All Koi keepers are welcomed to the events mentioned in this Calendar (an entry fee may be payable) and further details can be obtained from the contact telephone number quoted alongside the diary entry. My thanks go to all Koi Club Secretaries or 'PROs' and others who send me their latest calendar for inclusion in this column. If your club is not mentioned and you would like it to be, please write to me via the Editor at MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent, TN24 3ET. 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. To minimise the chance of this occurring you may find it more convenient to fax me direct on 01926 403500. This request also applies to dealers with special events, auctions, etc. I look forward to hearing from you.

# 50 Years Ago ...

In the period immediately after the war the increase of interest in all things aquatic was rapid.

Looking through past issues of *A&P* makes interesting reading not only for the diversity of subjects raised but for the apparent enthusiasm by all contributors whether they be authors, reporters from Societies or letters from readers. June 1947 threw up this selection of topics ...

## **From the June Assembly Meeting of the FBAS**

Attention was drawn to the exceedingly bad broadcasts made by the BBC on aquarium matters, which amount to adverse publicity for the hobby, and it was agreed that a protest should be made. *Cornish Aquarists' & Pondkeepers' Association*

## **An Honorary Member living in Malta writes:**

Your price list has been read over and over again and we are trying to find some scheme to get the fish out here. It costs 18.00 to come home and 37.00 to fly

As recounted by Editor **Dick Mills**

back. This is a bit too much for us to send somebody, but it has been considered. The airways will not carry live fish, only as personal baggage; the only reason we can think of for the restriction is superstition; it is pretty strong here. Many people will not even have a Goldfish in their houses because they bring bad luck. Any fish not large enough for the frying pan holds but little interest.

## **At the East Lancs Society, Mr Rooke's fine talk:**

Electricity for the Aquarist included simple diagrams showing the best methods of wiring, among which was one that allowed a 10° rise and fall in temperature between night and day which would be much superior to the usual constant temperature.

**The Enterprise Aquatic Society used the local annual Horticultural Show to attract new members by staging an aquatic exhibition. They got very profound on this subject as an extract from their report to *A&P* explains:**

Experience shows that

there are many people who are in need of the diversion and rest for the mind that our hobby offers. They are out there waiting for something to turn up, drifting, without interest. Those people would jump at the chance to experience our pleasures, they would grasp at this straw in a sea of discontent and apathy if the straw floated into their net. If Societies just sit back and wait for these people to find the hobby for themselves the wait will be very long. The Societies should step out and hand it to the public on a plate. There is a vast potential of enthusiasts among the general public who show interest at almost anything new or unusual but someone has to start it. If the Clubs would go to the public instead of asking the public to come to them, membership could soon be doubled. The local Horticultural Show or Fete is one way — the public are already gathered to be entertained.

## **Harrow Aquarists Club**

Applications to join the Club continue to arrive and it is necessary to keep within our limit of 100, but in order not to

disappoint newcomers to the hobby we undertake to recommend anyone we are unable to accommodate to another Society within reasonable distance of their residence. As vacancies occur in Harrow Club we shall continue to welcome new members.

## **Sheffield & District Aquarists Society**

A lecture on the Temperature of Water in Natural Waterways in Iraq was given by the Secretary, E. Chapman, also varying temperatures in different types of tanks for tropical fish, with suggestions for conserving the heat in tanks during this period of fuel shortages, and information as to the fixing up of electrical heaters to remove any likelihood of danger due to shock, etc. Current discussions in many Societies was the introduction of 'Microworm' from the Continent with many Societies obtaining samples from visiting Scandinavian aquarists for future culture. The news that the Government was to look sympathetically upon the use of fuel for tropical fishkeeping was also a great help in maintaining the hobby through the austerity years following the 1939-45 War.

## WILLOW MOSS; WATER MOSS

There are many species (some reports say as many as 60, although positive identification is difficult) of this cooler water plant. It is a member of the Fontinalacea Family in the Bryophyta group which also includes the Liverworts and Sphagnum Mosses.

### FONTINALIS ANTIPYRETICA (Linnaeus 1753)

**Description:** Tiny, triangular dark-green leaves arranged on the stems in alternating rows. The plant has no roots as such but clings to surfaces of underwater objects using 'rootlets' in a similar fashion to the tropical Java Moss.

**Distribution:** North America, Europe, Northern Asia, Northern and Southern Africa.

**Cultivation and Propagation:** The plant requires a good light and, because of its densely-packed leaves, good clean water conditions. By positioning it where it receives a good light and a constant flow of water through its stems will encourage excellent growth. Dextrins should not be allowed to settle on its leaves; it will become clogged with algae unless lighting conditions are not exactly correct. New additions to the aquarium can be fixed into position on a log or rock by means of thin nylon thread until the plant anchors itself naturally; alternatively, if collecting plants from the wild remove the plant along with its existing anchor-point. To propagate new stock, simply divide a bunch and relocate. It is reported that growth and leaf form vary according to water conditions; for instance low growth and dense leaves in acidic water; more normal appearance in neutral water; with the plant taking on a leggy appearance in hard alkaline water. Although very decorative as a space-filler and seen to advantage when kept with sunken logs or branches, it may not thrive so readily in warm water aquariums where temperatures are consistently above 20°C.

**Aquarium uses:** Willow Moss makes an excellent spawning medium as its dense leaf arrangement offers plenty of opportunities wherein falling eggs can safely lodge beyond the reach of the egg-hungry spawning adult fishes.

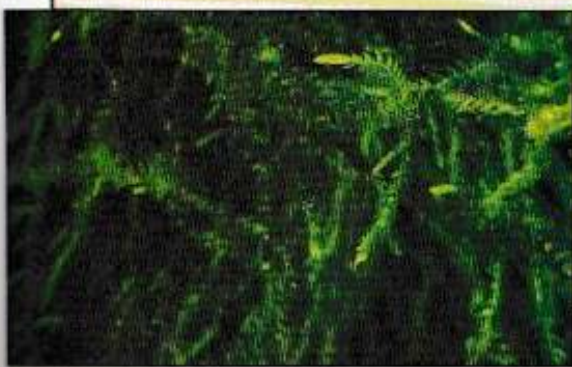
**Note:** The unusual specific name 'antipyretica' refers to the plants use as an incombustible material used as a firebreaking deterrent in Scandinavian housing.

# A to Z of plants

By

**DICK  
MILLS**

PHOTOGRAPH BY  
THE AUTHOR



## Aquarium Science MADE EASY

STRESS-GO MATURE TANK WHITE SPOT FINROT FUNGUS PLANTFEED



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and Artemia  
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Industrial Estate,  
East Peckham,  
Kent TN12 5HF



## Woodlands Garden Ornaments Ltd

This company manufactures a wide range of garden ornaments and statuary including a wide range of fountain ornaments. Their self-contained fountains come complete with pump. Woodlands Oriental Collection is very extensive containing figurines such as Buddhas and Dragons (in various sizes) and several types of Lanterns. The ornaments come in a variety of finishes.

For further information contact: Woodlands Garden Ornaments Ltd, Unit 2, Pool Road, Camphill Industrial Estate, Nuneaton, Warwickshire CV10 9EA. Tel: 01203 320352. Fax: 01203 320353.

## Interpet

In conjunction with its sister Company, Petlove, Interpet launch over 100 new products every year.

They chose Pet Index to release their new range of Aquarium ornaments called Nautical Treasures. Castles, Archways, Sunken Fishing Boats, and simulated rockwork pieces are just a few of the 35 items in this range.

Also released were the range of Easy Test Kits and the Easy Tank Aquarium Tank Checks.

These are simple dip-tests which test for several parameters at the same time. The Kit also includes a free booklet on maintaining aquarium water quality according to the prevailing conditions in the fishes' native habitats.

For further details contact: Interpet Ltd, Vincent Lane, Dorking, Surrey RH4 3YX. Tel: 01306 881033. Fax: 01306 885009.

## John Allan

The Company were showing their new range of stylish looking Pond Pumps. The range comprises three models — the 3270 delivers 3000 lph, the 3275 delivers 3600 lph and the 3280 delivers 5100 lph.

There is also a range of new accessories including a Volcanic

# BUY LINES

**BARRY JAMES** completes the round-up of new products at Petindex '97

Jet, Water Dome and an Extension Pipe.

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

## Exotic Direct

Readers wishing to insure their livestock will find complete cover from this Company who can insure Tropical and Marine Fish, Coldwater Fish (in Garden Ponds) and Reptiles, Birds and Mammals. For fish, the insurance covers the loss of the whole collection following theft, fire, flood, freezing, lightning, glass breakage, storms, wind, electrocution, sickness, disease and pump failure.

For a Proposal Form and details contact: Exotic Direct, Freeport (REC 2317), Haywards Heath, West Sussex RH16 22A. Tel: 01444 482946.

## BLCS Ltd

This Company is a product of Mardel Laboratories Inc of the USA which produces a huge range of pharmaceutical products for the aquarium including Test Kits, Water Conditioners for

freshwater and marine fish and the HerpCare range of products for Reptiles and Amphibia.

Further details from: BLCS Ltd, 101 Hendon Lane, Finchley, London N3 3SH. Tel: 0181 343 0734. Fax: 0181 346 2672.

## Tetra

Tetra, for 40 years the world leader in fish foods and makers of Reagents, Water Conditioners and Remedies, introduced their TetraTec Hi-Tech Internal Power Filters with the unique lift-out cartridge for easy cleaning. There are four models in the range with flow

rates from 60 to 200 litres per hour.

Also new on the market are their TetraTec HT Automatic Heater/Thermostats with models ranging from 75-300 watts.

To coincide with the pond season, there is a new range of Tetra Pond PF Filters; the dark green colour and modest size should make for easy disguising pondside whilst the clever design allows for easy maintenance. Three models are available — PF4000, PF7000 and PF10000, the model numbers denoting the maximum gallonage served by the corresponding filter. A feature of their display included, for this year only, a huge celebratory cake to mark the occasion of the 40th Anniversary of TetraFin, the Company's popular Goldfish flake food (no, it didn't taste of any of those renowned high-quality Tetra ingredients!).

Further information from: Tetra, Lambert Court, Chestnut Avenue, Eastleigh, Hants SO53 3ZQ. Tel: 01703 620500. Fax: 01703 629810.

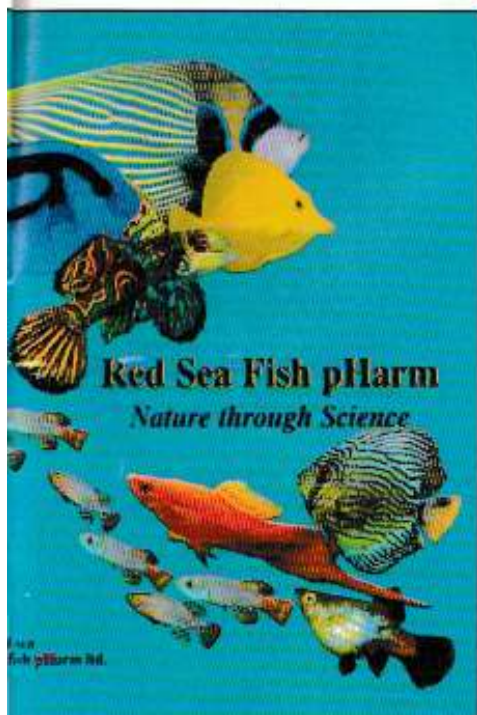
## Red Sea Fish Pharms

Latest developments in marine aquarium equipment designs could be viewed on this Company's display. Features amongst the exhibits were their full range of Berlin Protein Skimmers, Merlin Fluidized Biological Filters, Ozone Generators and Wave Makers as well as their entire range of Sea Salt, Conditioners and Test Kits for freshwater and Marine Aquaria.

Further details from: Alpha Aquarium, 62 High Road, Byfleet, Surrey KT14 7QL. Tel: 01932 353600. Fax: 01932 349718.

Mardel Freshwater Fish Care products make aquatic care efficient, easy and safe.





Booster' fish showed significant improvement in condition, colour and growth.

Managing Director Michael Sinclair said: "Our sales of flake fish food have rocketed over the past year. These latest developments are a major step towards achieving our goal of making King British the best selling fish food in the U.K."

For further information and samples contact: King British Aquatics Ltd, Haycliffe Lane, Bradford BD5 9ET. Tel: 01274 573551. Fax: 01274 521245.



## King British

King British has introduced stunning new packaging to make its food appeal to an even wider audience. In addition to its perfectly-balanced formulations (which include Stabilised Vitamin C and Spirulina — a natural algae which promotes colour) developed over 25 years of both fishkeeping and manufacturing fish foods, King British flake foods now feature stronger colours, sink and break down in water more slowly, both features incorporated by public demand after extensive consumer research.

King British is the only fish food to contain 'Immuno-Health Booster'. Consumer tests on over 15,000 fish have shown that when fed with foods containing 'Immuno-Health

## New name in Europe

CASCO has arrived. The California Aquarium Supply Company has set up CASCO Europe Limited.

Dealing with the highest

quality acrylic aquariums (for both dealer and hobbyist) the models are able to feature fully-self-contained equipment from the most basic filters to the AQUADYNE fully-computerised monitoring and control if required (Windows 95 users can monitor aquarium system status from a remote PC!). With all the safety and operating benefits

brought by the use of acrylic the Company expects a great deal of interest in its products. Of especial interest on its display was a 28 tank bank for displaying Siamese Fighters.

Further information from: CASCO Europe Ltd, PO Box 30, Crawley, West Sussex, RH10 3FR. Tel 0966 212138.



## Rolf C. Hagen

The Fluval External Power Filter Range has just got better! The Fluval External Power Filter has a reputation for being one of the most technologically advanced and yet user friendly pumps available today. Now the complete range of filters has been re-packaged and a whole new range of filter media is now available.

▶ CONTINUED OVERLEAF

◀ CONTINUED FROM PREVIOUS PAGE

to let you, the aquarist, create the filter that you need for your aquarium.

There are four models of the Fluval External Power Filter available. The Fluval 103 is appropriate for an aquarium with a maximum water volume of 100 litres, (25 US gallons). The Fluval 203 and 303 will filter a maximum water volume of 200 litres, (40 US gallons) and 280 litres, (70 US gallons) respectively. The largest model, the Fluval 403 will filter a water

# BUY LINES

BARRY JAMES looks at PETINDEX '97



volume of 400 litres, (100 US gallons). All models come complete with a spray bar, connectors, pipes, and a siphon starter bulb.

The beauty of the Fluval External Power Filter is that it contains three separate filter media chambers allowing the aquarist to choose the media which they prefer for their specific aquarium set up. All new Fluval External Power Filters come complete with three choices of media.

These are: Fluval Foam Insert, Bio-Max biological filter media and Fluval Activated Carbon.

The full range of Fluval media includes: Fluval Foam Inserts, Fluval Bio-Max, ceramic media, Fluval Ammonia Remover (available in two sizes), Fluval Peat Granules, Fluval Peat Fibres, Fluval Activated Carbon (available in two sizes), Fluval

Zeo-carb, Fluval Pre-Filter, ceramic media.

For further details contact: Rolf C. Hagen (UK) Ltd on 01977 556622.

## New ozoniser

A compact, fixed-rate Ozoniser has recently been launched. The Magic 03 unit does not require auxiliary equipment to control its output as this is achieved by its construction. The unit's low but constant production of Ozone makes it safe for the consumer and cannot over treat the water but will keep it from getting out of control in the first place. A single unit can be installed on most home aquariums — from a small coldwater to a large tropical. In the case of extra

large aquariums two units may be required. As an added advantage, the omission of the unit's need for control circuitry has resulted in the unit's cost of around £20 being extremely competitive.

For further information, contact: NATURALO PET PRODUCTS, 42 Bridge Mill Way, Maidstone, Kent ME15 6FD. Tel: 01622 207856.

## New Technology

The pond season will benefit from the new products developed specifically for this area of fishkeeping. Top of the topical list must be the Barley Straw Pouch for dealing with Blanketweed; then there's the pH Test and Nitrite Test, both vital information gatherers; Magiclear operates as a flocculent for clarifying the pond whilst Pond Mature is a starter seeder back to get biological filters 'up to speed' as soon as possible.

On the aquarium front, the two Aqua Multitest Kits contain reagents to test for pH 6.0-7.6, GH General Hardness and NO<sub>2</sub> Nitrite (Tropical freshwater) and pH 7.2-8.8, KH Carbonate Hardness and NO<sub>2</sub> Nitrite (Marines). Each comes in durable Plastic carry case and features pictorial instructions.

Details from: NT Laboratories Ltd, Unit 13, Branbridges Industrial Estate, East Peckham, Kent TN12 5HF. Tel: 01622 871387. Fax: 01622 871387.

**NEW**

**New Product Releases Spring 97**

**POND**

**AQUARIUM**

**NEW: AQUARIUM PRODUCTS**

**AQUA Multitest**

100% ACCURATE and REPRODUCIBLE Test Kits

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Available in single and double strength for clarifying ponds and swimming pools. Available in 1000 and 2000 gallon pond treatments.

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# Aquarama '97



**DAVID ARMITAGE'S** BEEN THERE, GOT THE T' SHIRT  
AND OVER 100 FISH

PHOTOGRAPHS BY THE AUTHOR

**U**ndoubtedly the world's biggest aquarium industry exhibition, the bi-annual Aquarama this year, coincided with the end of my Malaysian collecting trip, which gave me my first opportunity to attend.

This exhibition at the World Trade Centre, Singapore, runs for four days, from Thursday to Sunday but the public are only admitted for the last one and a half days, reflecting the fact that this is largely a trade event, where real business is expected to be done.

Nevertheless, all the

elements of the hobbyists' aquarium events are there: a competitive Fish Show where breeders compete for the prestigious awards that will bring them lucrative export orders and exhibits of fish by exporters of wild-caught and farm-bred fish, keen to show the quality of their fish to prospective customers. There are displays of furnished and unfurnished aquaria and aquarium equipment, some familiar, others that I had never seen before and of course publishers were present, such as TFH and the excellent Australian hobby journal, 'Practical Aquariums and Water Gardens'. Fish are there to

be bought, but the usual arrangement is to book the exporters' show fish and to collect and pay for them at 'close of play' on the last day. The professionalism of this premier exhibition of course takes the breath away. However, having seen the organisers of YAF in action this year it makes me even more impressed by the dedication and effectiveness of the volunteers who organise the UK exhibitions.

The stands of Tetra and Hagen were impressive but their products will be familiar to our readers by now. I was attracted to a Japanese firm, 'Nippo' (Contact: Nippo UK, 20 Berkeley Square, London

W1X 5AE) with an interesting range of aquaria with a single plate of curved glass at the front and sides, self-contained filtration and heater and a hinged lid with its own lighting unit. They also displayed an aquarium within a vivarium, which I was very taken with.

Another impressive display of Japanese aquarium furniture was from Aqua Design Amano (home page <http://www.rim.or.jp/~ada/>) of their nature aquarium concept, recently featured in three books by Takashi Amano, published by TFH.

The aesthetic beauty of their aquaria and publications, combined with the latest scientific

technology are surely the future of the hobby.

The printing of many of the Chinese and Japanese publications was quite outstanding. Particularly notable were New Life Publications ([newlife@nlpublish.com](mailto:newlife@nlpublish.com)) with their Pictorial Cichlid Guide and Marine Aquarium Companion.

As well as the Singapore exporters there were notable displays from the industries of Thailand, Sri Lanka and Indonesia, which would have been enhanced by living displays of native fish. However, I was particularly impressed by the representatives of the Indian industry with their excellent display of superbly conditioned wild caught Snakeheads and Labyrinthfish. I was particularly taken by some splendid *Channa bleheri* and some robust examples of the enigmatic Chameleon Gourami, *Ctenopoma nobilis*.

• Angelo, 84 Radhnan Mullick Lane, Calcutta 700 012 India +91 33 2415478.

• Aqua Decor, 77 Netaji Subhas Road, 1st Floor, Suite No. 111, Calcutta 700 001 India ([aqua.decor@elnet.ens.vsnl.net.in](mailto:aqua.decor@elnet.ens.vsnl.net.in))

The fish competition itself largely comprised exhibits of Discus, Guppies, Goldfish with some new 'species'. It would add to the interest if this aspect could be broadened to include classes for all major families of freshwater species: Catfish, Cichlids, Killies and Anabantoids, for example.

However, the event is more than an exhibition as a concurrent conference discusses matters of interest in the industry. There were sessions on the emerging Asian market, fish product technology, health and welfare management, conservation and sustainable resource management and demonstration workshops



ABOVE  
1st Goldfish 'Ryukin'

BELOW  
A new variety of the Dwarf Gourami.



on fish health. On the Sunday a number of technical visits were organised to some of the many Singapore fish farms and export centres.

I attended part of the important session on conservation and sustainable resource management, chaired by *AGP's* previous Editor, John Dawes (now O&E Editor and co-ordinator). My main interest was to hear Dr Peter Ng of Singapore University discussing conservation issues pertaining to the SE Asian aquarium fish trade. He talked about sustainable

catching using the Clown Loach as an example. This migrates upstream to breed in unfound areas and the young are caught on their en-masse downstream migration using trapping techniques which cause little stress and thus low mortality. As a result of exporting fish no larger than 8cm the catches have shown no apparent decrease and the trade is apparently sustainable. In contrast, the fishery of *Bala striata* had collapsed because fish of all sizes were caught. Another talk by Greg Prang showed the complex

interrelationships between different aspects of the Amazon fishery. Project Piabara, partly funded by Dr Axelrod, brings together a public aquarium display and education facilities, fish health and welfare aspects and scientific studies, eg. in fish diversity and population numbers. These aspects are inextricably linked with social issues such as the relationship between the collectors and the exporters. One question for those who oppose fish collection from the wild is: 'Would the alternative methods of employment such as subsistence farming or gold mining be likely to increase ecological damage?'

It was evident from the questions that there were tensions between conservation interests and the trade and it occurred to me that a modest levy from the trade could be used to fund research into aspects such as population ecology and captive breeding.

Half the fun of attending such events is bumping into old friends and acquaintances so it was nice to see John Dawes again, en route to his new home in Spain, and to see Heiko Bleher promoting the latest copy of his excellent quarterly magazine, *Aqua Geographica* — a sort of cross between National Geographic and an Aquarium magazine (available from Mary Bailey). My friends at Singapore University were able to introduce me to several people including one of the Sim family, Sumatran exporters whose name has recently been attached to a new Betta. It is doubtful that I will be in Singapore at the right time for the next Aquarama by sheer coincidence, but my first experience was enough to persuade me that it is worthwhile engineering a Malaysian trip to end in Singapore at the right time.

# Jackie's Juniors



Hi, Junior Fishkeepers! We have something different for you this month in the shape of a Quiz and a Painting/Colouring Competition.

All you have to do is identify the outlined fishes and colour them in accordingly. There is no definite correct set of answers — for example, you could identify some outlines in several ways but whichever decision you come to then that species must be coloured in correctly. So, complete the species answers (of your own choosing) to the outlines:

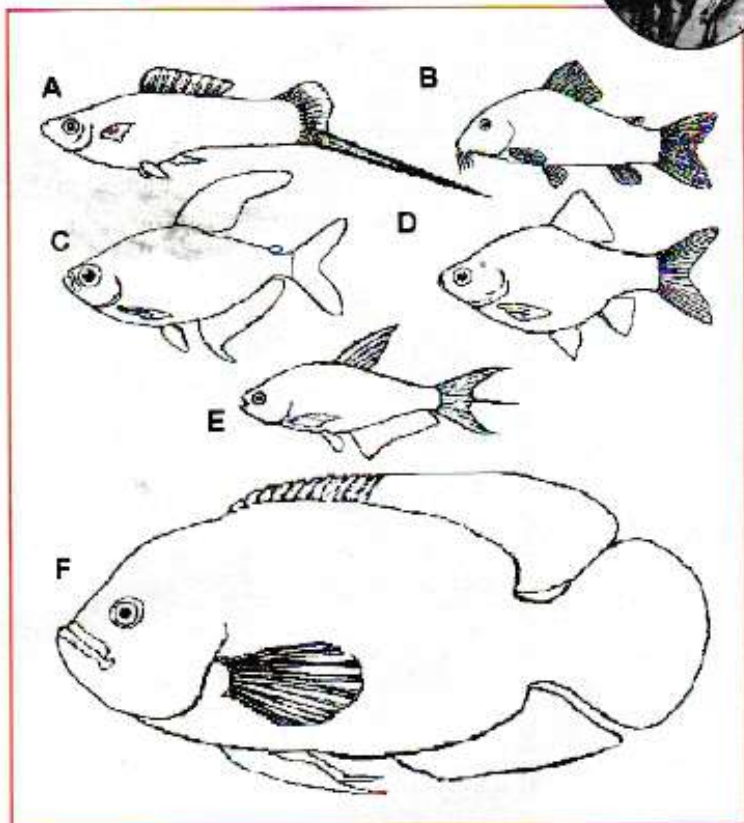
- A \_\_\_\_\_
- B \_\_\_\_\_
- C \_\_\_\_\_
- D \_\_\_\_\_
- E \_\_\_\_\_
- F \_\_\_\_\_

And get colouring! Send your completed coloured fishes to: Painting Competition, MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent TN24 8ET, to arrive no later than 15 August.

The first three correct entries out of the bag will win a year's subscription to A&P PLUS free admission to Fishworld '97 at the Queensway Hall, Dunstable, Bedfordshire (30 or 31 August).

Fifteen runners-up will receive free admission to Fishworld '97.

Note: Free admission tickets will include winning Junior (who must be accompanied by an adult) plus up to two accompanying adults. Unaccompanied Juniors will not be admitted under this offer.



Remember, those lovely people at John Allen Aquariums are giving a prize for the best received — SO DON'T DELAY — DO IT TODAY! Please write to: Jackie's Juniors, c/o A&P, MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent TN24 8ET

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# Caught in the Net

Kathy Jinkings trawls up more contacts from deep cyberspace

When you're watching the fish in your tanks do you ever wonder about where they came from, and what their habitats are like? Most fish books are too busy telling you about how to keep them to spare more than a few lines for this sort of information. This month we will be looking at some Internet pages written by people who have visited the fish's home rivers, and given some of their time to sharing their experiences with net readers.

First stop is at Tales from the Peruvian Amazon, at <http://www.contentpark.com/amazonas/tales/homepage.html>. This is the starting point for a variety of pages about Project Amazonas collecting trips to the Iquitos region. During the trips more than 220 species of fish were documented in the Rio Orosa, a tributary of the Amazon. By following the different links on the pages you can see spectacular photographs of the region, read a diary of the trip written in an informal but very descriptive style, read about Project Amazonas itself which sponsored the trips, and even see some pictures drawn by local children. This is an excellent collection of pages, which give a real flavour of what the area is like. The only possible complaint is that there is no real structure to the pages, or a menu page, so it is easy to miss some of it. Each page links to several others, but not all of them, so it can take some going backwards and forwards to find all the

pieces!

The Cichlid Room, at <http://205.243.62.12/cichlidroom/>, has a large collection of cichlid articles, photographs and information. For those undistracted by the variety of pages on offer, the topic of fish-collecting and natural habitats can be pursued with Lee Newman, who has also been inspired by Iquitos. He went especially to collect cichlids, and his experiences and photos are well documented at <http://www.petsforum.com/cichlidroom/articles/a033.html>. Don Danko has been to Mexico in Search of the Pink Penestratus, at <http://205.243.62.12/cichlidroom/articles/a023.html>, again well documented with lots of beautiful photographs of both fish and the countryside.

Mexico once again comes under the spotlight as the home of a Blind Catfish, *Prietello phreatophila*. At <http://www.utexas.edu/depts/tnhc/www/fish/tnhc/geograph/mex/coal/caves/cavehab.html> you can see a large collection of pictures of the catfish itself, and the caves that it lives in. From the cavefish site you can follow a link to The Desert Fishes Council, at <http://www.utexas.edu/depts/tnhc/www/fish/dfc/>. Here there is information on every aspect of fish that live in desert areas in America and Australia. Under the Fish and Places section there are articles about the fish and their habitats, photos, and videos (but remember these take a long time to

download). This is another extensive site well worth browsing through.

Mention Japan and everybody thinks of Koi. There are, however, a multitude of other fish in Japanese waters — the Medaka, or Ricefish, is a common import to our aquaria but others may be less familiar. An interesting page has been created by the children at Hirano Elementary School, who are on the shores of Lake Biwa. They are in the process of creating a very comprehensive page on the fauna of the lake, and so far have achieved excellent collections of photos of both the fish and, unusually, the plankton. They are still working on more information about the lake itself and the waterfowl that live there. This is an excellent example of how the Internet can stimulate interest in children, and a good guide to a lake that probably none of us would have heard of otherwise. If you enjoy their pages I'm sure a quick email would encourage them in some excellent work.

Although many fish are now bred in captivity successfully, many are not, and there are probably even more species to be discovered. Most aquarists are probably already aware of the need to safeguard natural environments and habitats. For more information a stop at People and the Planet, <http://www.oneworld.org/patp/index.html>, will reveal the desperate straits many habitats are in. 'Lake Victoria:

a Sick Giant' discusses the damage done to the area by Man, and discusses the 'greatest vertebrate mass extinction in recorded history' of over half the cichlid species — already past redemption, while the damage to the Aral Sea discussed in 'Requiem for a Dying Sea' shows how the loss of the habitat has not only hurt its inhabitants but is bringing tremendous hardship to the people who live there. This isn't a site with lots of whizz-bangs and pretty pictures, but informs clearly and succinctly on the damage being done to the planet. The serious surfer might also like to drop in at the Aquatic Conservation Network, <http://www.achilles.net/holiday/acn/acnhome.html>, where they can read a large number of the bulletins issued by the network, and find out how to join if consciences have been sufficiently stirred.

Two late catches: The Federation of New Zealand Aquatic Societies are at: <http://www.aquaria.net/nzfas/page2.htm> and, nearer to home, Eastbourne & District Pondkeeping Club are at <http://freespace.virgin.net/b.abbott>

Next month we'll be taking a look at marine life habitats on the Net, both at home and abroad but in the meantime, remember — To err is human, but to really foul things up requires a computer!

# Beautiful Bristlenoses

**KATHY JINKINGS** FINDS FISH  
WITH DESIGNER STUBBLE  
PHOTOGRAPHS BY MR. & C. PIEDNOIR

**W**hile still a novice to fish-keeping, it can be startling while browsing around tanks of flashing Neon Tetras and extravagant Guppies, to encounter your first Bristlenose.

At first glance they are remarkably unprepossessing fish, being neither (in the main) beautifully-coloured, nor obviously active in the shop. The watching novice might well wonder why anyone should wish to use up tank space by keeping such a fish. However, once you have become the owner of a Bristlenose their charms quickly become apparent, and it is then hard to imagine a tank without a place for one of these endearing fish.

Bristlenoses are catfish of the Loricariid Family, in common with Plecos and Whiptails, and as such share their relatives' talent for algae-eating. A pair of

Bristlenoses go through algae build up like lawnmowers, and a tank with the glass totally obscured will be rendered totally algae-free within the space of a few weeks. Not only are they particularly diligent in their algae-eating activities, but as they only grow to around 4 to 5in long they are suitable as long-term tank-cleaners, unlike the commonly sold Plecos which grow rapidly to a very large size.

Although two adult males will fight they can be kept with any fish other than the most aggressive, and can even be kept in tanks of small fry once they are free-swimming.

In addition to their talents as housekeepers they are often friendly fish easily seen out and about in the tank. When buying them, it is easy to be tempted by a full-grown fish with large bristles, but these are often wild caught and remain shy and frightened. If you choose a baby (about an



inch in length) these are not only cheaper but will adjust to your tank routine much easier. They grow amazingly fast, with a good diet, and will be full size in a couple of years. At this size they don't have bristles though, so you will to buy a group to be sure of getting a pair.

Their needs are simple — plenty of oxygen, and a piece of bogwood to hide underneath. If there is an oxygen shortage it will become apparent in the Bristlenoses first — while attached to the glass their

gills will be seen pumping furiously, and they then quickly move up to the surface of the water. If the situation is not remedied quickly death will result.

The bogwood supplies them both with a home and a part of their diet. The catfish rasp away at the size of the wood does not diminish appreciably it is necessary to keep their digestion in top form. For this reason ceramic or plastic alternatives are unsuitable, both being unappetising to



catfish! Of course, a diet of algae and bogwood is not sufficient, and the Bristlenoses need to be fed like any other fish. Many Bristlenoses (and other 'algae-eaters') starve quietly in the tanks of well-meaning aquarists who assume they don't need any special food. Although they will eat flake they can only eat food that falls to the bottom, so if they get a lot there you are overfeeding! A varied diet is best, including sinking



pellets, flake food that has been pre-soaked so that it falls to the bottom, algae wafers, cucumber, and blanched lettuce or spinach.

Surprisingly to many people they also like bloodworm and other live or frozen food. In the wild, many of the Loricariid catfish are more omnivorous than vegetarian, and will be much healthier with the occasional addition of 'meat' foods to their diet. Although

they will not attack living fish corpses are polished off very quickly. In a tank with Bristlenoses dead fish disappear as though by magic, which helps to keep the tank clean if a fish dies



unnoticed. A starving Bristlenose can only be noticed from the bottom, as being covered with bony plates the shape as seen from the top does not change. However, when they are about their algae-cleaning activities attached to the

glass the soft stomach can be clearly seen — if this appears concave it's time to feed your Bristlenose fast. If you are buying a Bristlenose from a shop you are not sure of check their stomachs

either while they are on the glass or while they are in the plastic bag. Half-starved fish are less likely to survive the trauma of a move than well-fed ones.

They are placid and unaggressive fish (except when two mature males are

kept together, when they may fight seriously) and can be kept in tanks with all but the most aggressive fish. They will not even harm fry once they are free swimming, and many

breeders rear broods of Bristlenoses along with other fish to ensure that no waste food is left to rot on the bottom. A group of females will live together but they will be at their best (and most interesting) when kept as a pair. A pair will live and breed happily in a 30in tank.

As the fish mature the males grow prominent fleshy 'bristles' around the mouth and on top of the head. The formation of the bristles is dependent on species, some having simple

short ones, and others growing spectacular long bristles that branch like antlers.

The male also grows small spines on the leading edges of the pectoral fins. These appendages can make netting them an unpleasant

## TROPICAL SCARIFIED BRISTLENOSES

task, as they are not only amazingly quick when pursued, but tangle themselves so thoroughly in netting that it takes longer to get them out than it did to net them in the first place. If this occurs it is easy to damage the fish, and the net should be left in the tank quietly to see if the fish will disentangle itself. If it can't it may be necessary to cut the net to free it. If the fish is used to you it is a relatively simple matter to catch them by hand, and as they are armoured they do not have delicate scales or skins that would be damaged by this procedure. Females either grow no bristles at all or much smaller ones.

Once the bristles appear it is only a short time before the fish start to raise a family. They spawn willingly in any type of water and will breed in community tanks. Many people place lengths of pipe in the tank for the fish to spawn in — my male, which is guarding eggs as I write, has always scorned these in favour of the piece of bogwood which he lives beneath when not out and about. Any nook or cranny into which the fish will fit is liable to become a nursery. The eggs are laid in a large cluster and are bright orange in colour. Each egg is 3–4mm in diameter, and the whole looks like a giant orange raspberry. The male guards and tends these eggs with dedication. Most of the time he is attached firmly by the mouth to the egg cluster, and continually oxygenates and cleans them.

At this time the female can be left in the tank and will not harm the eggs, but she takes no part in the egg-tending activities. If the bogwood or pipe is accidentally lifted before you realise that there are eggs there the male will usually remain attached and if the bogwood is replaced gently no harm will result. Care should be taken not to knock the cluster off as if

this happens the spawn usually dies. The eggs are almost impossible to hatch artificially largely because of their cluster formation. If an egg in the centre dies and fungus starts the whole cluster is rapidly consumed. How the male manages to overcome this problem is a mystery but overcome it he does, and a 100 per cent hatch rate is common. The eggs hatch in about five days, but sometimes this is not immediately apparent, as newly-hatched Bristlenoses look very like Bristlenose eggs! The bright orange yolk which constituted the major part of the egg is still present, and the only change is that there is a tiny tail waving from it. They do move around in the immediate vicinity though, and if the catfish have spawned in a community tank this is the time to remove the fry. This can be done by placing the bogwood or pipe in a bowl underwater, and then removing the bowl complete with bogwood and fry. Escapees can be rounded up with a chicken-baster, as they are easy to spot. If the spawning took place in a species set-up the male will continue to guard the fry, and will not harm them.

The fry will continue to feed off their giant yolks for another four or five days. At first there is no obvious change and then suddenly, almost overnight, the orange balloons are gone and the tank is full of tiny Bristlenoses. There are often around 100 eggs (it doesn't look it when they are still in a cluster) and 100 little Bristlenoses take a lot of feeding. Cucumber, algae wafers and sinking pellets are all eagerly consumed, as is frozen 'live' food. Care must

be taken to avoid fouling the water so they should be fed regularly rather than dropping in a big piece and leaving them to help themselves.

Filtration is essential and a sponge air-driven filter is ideal. Water changes (dechlorinated!) should be performed regularly. The fry grow rapidly and soon they need to be split up among several tanks or thinned out. As little Bristlenoses are very cute usually friends and relations can be relied on to reduce the numbers. At this time lack of oxygen is the major killer. Their fast growth rate means that a tank full of happy little Bristlenoses can contain Bristlenoses in the last stage of oxygen starvation a week later. Watch out for them heading for the surface and if necessary add additional air flow. Once they are all hanging round the top gasping it is usually too late. With good tank maintenance and careful monitoring they will soon be ready to leave for new homes.

Bristlenoses are one of the few easily spawned fish that can be profitable — shops have a continual demand and reasonable prices can be obtained for fish around an inch long. Don't believe the shop owner who offers to 'take them off your hands' — there is always a ready market for them.

Although generically known as 'Bristlenoses' there are many species. The ones most commonly seen in shops are *Ancistrus tommincki*, which is brown with large whitish mottles. There are, however, many other species, some of which are extremely attractive. *Ancistrus hoplogynis* is often used to refer to a remarkably wide range of fish which are

obviously of different species. The original hoplogynis is a very striking fish, being jet black with tiny white dots, and is often sold under the name 'Starlight Pleco'.

Bristlenoses are one of the few remaining aquatic areas where bargain hunters can have a field day. While full-grown Bristlenoses are much easier to categorise, tiny ones, especially wild caught, can be a mixed bag of a number of species, some of which can grow up to be not only attractive but actually worth money. 'Standard' species (*A. tommincki* and *A. dolichopterus*) have fry of exactly the same body shape as their parents, with a dark (almost black) body colour and large white (but distinct) spots. The tails have a white band at the end. In a tank of 'Ancistrus' at a couple of pounds each anything that differs from this is worth taking a gamble on. Watch out for those in which the spots are absent, or tiny dots like pinpricks, or in which the body shape is different. I currently have a tank of 'mixed Ancistrus' growing up which contains at least five different species, all bought for £1.50 each, including some with yellow spots, and some with red fins, waiting to be identified as they mature, as well as a few 'Bulldog Plecos' which also came as 'Ancistrus'.

Hopefully, the novices among you will now regard the 'ugly fish' with more interest, and those of the more experienced who haven't tried Bristlenoses might like to give them a place. They are easily obtained, easy to keep and breed, and interesting and fun to watch. If you are really interested the Aqualog Loricariids book provides a complete pictorial listing of all the Bristlenose species known (so far!) along with all the other fascinating fish so often dismissed as 'algae-eaters', and is the best source of reference for identifying your 'mystery purchases'.

# A Sunbed for Fishes?

**DICK MILLS** LOOKS AT THE USE OF ULTRA-VIOLET LIGHT IN THE MARINE AQUARIUM

PHOTOGRAPH BY MP. & C. PIEDNOIR

Ultra-violet light (UV for shortness' sake) is found in many diverse locations and for many differing purposes. No self-respecting butcher or meat department in a supermarket is without the violet glowing lamp somewhere up on the wall, sun-tanning parlours depend on them whilst dancing the night away would not be the same without the fluorescing effect from white clothing and your partner's teeth.

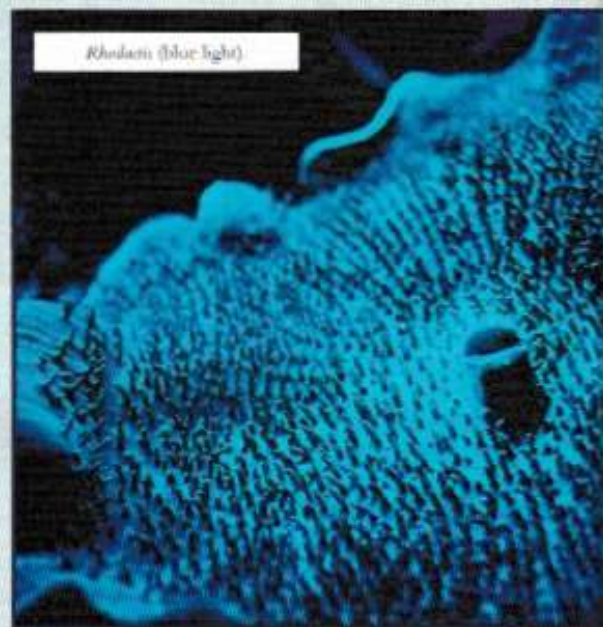
Turning to matters aquatic, UV has been around for over 20 years or so at least; I recall toying

with the idea of making an ozoniser from a UV lamp housed in an empty plastic fish food container — yes, ozone used to be produced from passing air near to a UV lamp before the modern 'silent-discharge' designs came into being.

Nowadays, UV has come of age and is present in many areas of fishkeeping, with probably the largest use (aside from centrally-sited filtration systems) is now in the control of green water in our dour ponds.

## WHAT IS UV?

Well of course it's light of some kind but it occupies a special part of the spectrum up near the X-rays just beyond the



visible part of the spectrum as far as we humans are concerned. It has a very short wavelength and generally has a bad effect on anything close to its source — especially one's eyes — NEVER LOOK AT AN UNPROTECTED UV LAMP. Apart from specially-made UV lamps UV light is also emitted from other types of lamp too: the high-intensity metal

halide lamps so beloved by mariners are best suspended some distance above the water (or else fitted with screens) to prevent too much UV reaching the aquarium directly where it can cause adverse effects on coral growth (Fossa & Nilsen, 1996). As mentioned earlier, 'black light' lamps are also a source of UV and actinic lamps also produce it.



## USES IN THE AQUARIUM

The main use is to remove pathogens from the water, harmful organisms (good ones as well, incidentally) being killed as they pass near to the irradiation. It is reported (Spotte, 1979) that the DNA in any organism is inactivated and/or that

chemical changes in the water due to the UV effect produces toxicants. However, all this presupposes that the organisms are able to be in the water near to the UV lamp and this, in essence, is why UV irradiation is never 100 per cent effective; even if all the free-swimming organisms are swept by the lamp there will always be a few left attached to surfaces in the aquarium and even on the skin of the fish and invertebrates themselves.

Like ozone, UV should be used in isolation from the main aquarium, using a separate reaction chamber or water jacket; it may also be prudent to pass the irradiated water through some activated carbon on its way back to the aquarium to remove any little ozone produced by the lamp.

## EFFECTIVENESS

There are several variable factors to be taken into consideration: the prime factor is exposure time to the UV rays and this can again depend on at least two further factors: the strength of the UV lamp and also the speed of the passing water. In the final analysis a low-powered lamp can be just as effective with slow-moving water as a high-powered lamp to swiftly-flowing water but slowing the water flow down past a high-power lamp is obviously much better.

Other factors affecting efficiency are temperature (UV appears to work best at 40°C, and in some designs of UV sterilisers this temperature is obtained immediately surrounding the lamp by trapping the heat from the lamp inside a small air-gap inside the surrounding water-carrying jacket), water clarity and physical nearness to the

lamp. Pre-filtering the water before it reaches the lamp gives better results as does ensuring that the water flows around the lamp as close to it as the quartz sleeve will allow. Of course, like all lamps, the UV lamp loses its generating powers after a certain period of time despite no apparent falling off of light output; it is recommended that UV lamps are changed every year at least or more probably every six months to retain their optimum output and effect.

A difference of opinion appears to exist between those who state that UV penetration through water is limited to those who believe that it can penetrate much further than at first assumed, although the generality should not be accepted without any specification which of the three types of UV (UV-A, UV-B and UV-C) is involved. This leads on to further effects of using UV.

## SIDE-EFFECTS

It has also been reported that UV causes a drop off of efficiency in protein skimmers by diminishing the surfactant properties of the protein which otherwise would have led to its collection (and disposal) by protein skimming. Again there is some differences of opinion about this point too.

An effect noted years ago (de Graaf, 1968) was that UV creates various chemical interactions, including reducing nitrates to nitrites, and causing de-oxygenation in water containing copper compounds; old synthetic seawater mixes at that time were likely to produce free iodine (not a good thing) under the influence of UV. The moral is clear — just as electricity and water don't mix, neither do UV and

any type of drug! On the other hand, de Graaf also reported on experimental work conducted at the Artis Aquarium in Amsterdam and elsewhere wherein long-wave UV (i.e. that produced by 'black light' lamps, penetrating further through water than the other two types had a healing effect on Exophthalmus ('pop-eye') and also on skin and fin injuries.

## MAKE YOUR MIND UP TIME

There is no doubting the UV lamp's ability to kill off organisms and, on balance, it will keep free-swimming organisms in the aquarium water down to a minimum. For the generally understocked reef aquarium it may not be quite so obligatory as it may well be for the fish-only aquarium or for a centralised filtration system keeping a large body of water clean. Perhaps there may be a role for UV in, say, a much smaller set-up such as a quarantine tank, wherein new stock (together with any possibly 'contaminated' water) can be cleaned up before being introduced into the main collection.

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Out & About

# Vancouver Aquarium

**PHILIP HUNT VISITS**  
CANADA'S BEST  
PHOTOGRAPHS BY THE AUTHOR

**W**here can you find yourself on the set of TV's *The X Files* while learning how to keep a marine aquarium, taking a look at some extraordinary coldwater 'reef systems' and seeing some real tankbusters kept, for once, in appropriate surroundings? The answer is at the Vancouver Aquarium.

Surrounded by mountains and ocean on the Pacific coast of Canada, Vancouver is among the world's most beautiful cities. Established in 1956 and situated in Stanley Park, on the edge of downtown Vancouver, the aquarium is now recognised as Canada's finest. Stanley Park, incidentally, is also the setting for a lot of the outdoor action in *The X Files*, which is largely filmed

in and around Vancouver, including, in some episodes, at the Aquarium.

Before going on to describe the wonders of the Aquarium it is probably worth mentioning that anyone who is vehemently opposed to the keeping of Whales and Dolphins in captivity should be aware that the Vancouver Aquarium is home to two Killer Whales (Orca), a single Dolphin, and three Belugas, one of which was born in captivity.

Cetaceans apart, there are a host of attractions for the home aquarist. The indoor part of the Aquarium is divided into three sections. The largest of these is devoted to local fish and invertebrates. The Sandwell North Pacific Gallery features some of the spectacular marine life of the Pacific coast of Canada and



the northern USA. In this gallery are many exhibits representing local environments. In effect, these are coldwater reef systems where local fish cruise among the many beautiful invertebrates that are so prolific in these plankton-rich waters, in tanks decorated with

colourful local living rock. Aquarists familiar with the predominantly silver and grey native fish on display in British Sea Life Centres will be astonished by the bright red and orange hues of many of the North Pacific species. Highlights of this section include a dimly-lit tank devoted to Moon

Jellyfish (*Aurelia aurita*), a tank with a huge, glittering shoal of Pacific Herring and, best of all, an aquarium whose star attraction is a giant Pacific Octopus, albeit a juvenile. Actually, when I say a giant octopus, I actually mean giant octopi, because each vivid-red

exhibit. Passing through this gallery leads to the Rufe Gibbs Hall, with brackish and freshwater systems featuring local game fish.

The next major area, the Graham Amazon Gallery, provides a complete contrast. Here, a rainforest exhibit is maintained under

screened off from the public by glass walls, naturally.

For aquarists, however, the highlight of this part of the aquarium is a huge tank, around 8ft (240cm) deep with curved acrylic walls, housing some familiar fish, Red-tailed Catfish, Pacus and a variety of large cichlids

One look at the Red-tailed cat, all heavily-built 4ft (120cm) of it, should be enough to dissuade all but the most ardent and dedicated enthusiast from keeping one at home, and the same is true of the Pacus, which are around 3ft (90cm) in diameter. Around the walls of the Amazon Gallery are many smaller aquaria, with attractive, planted displays of some of the smaller residents of this great river system, from Piranhas to a variety of Cichlids to Tetras, but I'm sure that many aquarists, like me, will find it difficult to tear themselves away from the huge central tank.

The final indoor area is the H. R. MacMillan Tropical Gallery, devoted to the coral reefs of the Pacific, where marine aquarists will find themselves as awestruck as their freshwater counterparts would be in the Graham Amazon Gallery. The major display here is a 22ft (7m) long tank, with an



ABOVE A visitor photographs the aquarium's enormous Red-tailed Catfish.

LEFT Young visitors enjoying the immense central tank of the Graham Amazon Gallery.

RIGHT Plumed Anemones and other invertebrates share a tank with local fish in one of the North Pacific exhibits.



cephalopod is only resident in the Aquarium for a short period before being returned to the wild and replaced with another individual. As many cephalopods, if I stick my neck out, may well be as intelligent as Whales and other marine mammals, this seems to be quite a humane way of managing such an

authentic climatic conditions, complete with regular bursts of rain! Butterflies and exotic birds flit among the lush tropical vegetation, and Alligators, Turtles and Snakes inhabit pools tucked beneath —

share this dimly-lit exhibit with an immense Arapaima. It's good for once to see these fish in appropriate surroundings, many public aquaria, let alone home aquarists, don't provide them with enough space.

acrylic wall which curves out above visitors' heads. X Files fans will recognise this display from a couple of episodes. In this truly spectacular aquarium Black Tip Reef Sharks (*Carcharhinus melanopterus*)

# Out & About at Vancouver Aquarium

cruise among a huge population of smaller reef fish, most of which are familiar to marine aquarists, including a variety of Damselfish, Tangs, Angels and Triggers, all of which seem to live harmoniously — the Sharks must be kept well-fed! The smaller marine displays are no less spectacular; the next largest is an 8ft (2.4m) deep system decorated with fibreglass corals, which houses a reef

and an impressive reef tank, are very much in the home aquarium vein. The

of Pine-cone fishes (*Monacanthus japonicus*) which are often seen in textbooks but

seldom in the flesh, and a darkened system housing the bioluminescent Flashlight Fish (*Anomalops katoptron*), among others.

The Vancouver Aquarium also has outdoor attractions,

apart from the Whales and Dolphins. A group of Sea Otters form part of a successful breeding programme, and includes survivors rescued from the Exxon Valdez oil spill a few years ago. Another display houses Harbour Seals, the

population consisting of injured or abandoned pups found among the British Columbia coast which are nursed back to health prior to being released. Finally, a large, deep pool provides a window into kelp forest habitat, being home to Sturgeon, and some hefty Wrasses, in addition to food fishes such as Salmon, Cod, Sea Bream and Turbot.

Vancouver is becoming increasingly popular as a venue for international congresses, and with a wealth of other attractions in British Columbia and the Pacific Northwest of the USA, attracts interesting numbers of tourists. The Vancouver Aquarium certainly merits a place on the itinerary of anyone in the area who has an interest in aquaria.

Further information on opening hours and admission charges can be obtained by calling the Aquarium on 001 604 682 1118.

**Editor's Note:** Having visited Vancouver last year I can wholeheartedly back up Philip's sentiments and thoroughly recommend a visit (even if it means a detour). For those interested in fish and sea-dwelling mammals of the area the National Audubon Society's Field Guide to North American Fishes, Whales and Dolphins (ISBN 0-394-53405-0, see *AGP*, November 1996) is worth getting hold of.



ABOVE The impressive living reef exhibit. The bubbles are produced by a surge generator.

BELOW RIGHT The Philippine marine fish display.

community of a variety of Wreckfish, some superb adult Emperor Angels, and many species of Butterfly fish, among others.

One thing that is good to see on these marine displays is the encouraging advice given to home aquarists; many of the tanks aren't much bigger than most home systems, and two of them in particular, a traditional fish-only system set up with coral skeletons and housing a variety of species from the Philippines,

Vancouver Aquarium has, incidentally, been involved in efforts to get collectors in the Philippines to stop using cyanide, and one piece of advice given on the Philippine fish display, to ask your dealer for net-caught fish, is well worth following.

Other tropical marine displays here feature venomous fish, such as Lionfish and Stonefish, an interesting tank



# BOOK REVIEWS

## Garden Features Made Easy

Author: **Alan Sargent**  
Publisher: **Alan Sargent Ltd**  
Price: **£6.99**  
ISBN: **0-9530576-0-7**

Published with sublime timing this book by Alan Sargent emerges to coincide with the flush of garden shows around the country. Inspired by what they see at these enormously-popular events, the home-going visitor can take heart from the information in this book that creating a feature in the garden is not beyond his or her capabilities.

For the aquarist the main interest in the book will be the designs and instructions for creating water features — from simple bubble fountains upwards to fully-finned ponds.

Noted for his award-winning designs at Chelsea and Hampton Court Shows the author brings much expertise (and commonsense) into his instructions with great emphasis on safety precautions coupled with handy hints and tips. This all leads to a confidence-building exercise for those as yet inexperienced of water gardening construction work. Full details as to how to plan and assess the requirements of both design and materials needed are provided and none of the designs are so sophisticated or complex as to intimidate the first-time builder.

Following on from the water feature designs are more detailed descriptions (and ideas) for building Walls, Fencing, Paving and anything else you could wish for to complement your pondside surrounds — even a barbecue!

Anyone who has worked with Alan at exhibitions knows that he has an abundance of enthusiasm for the subject, has a treasure trove of experience from which to draw upon and, at the same time, is more than willing to impart his practical wisdom to all; do as he does and

you won't lift a shovelful more of back-breaking earth than is absolutely necessary, nor spend more than is appropriate. Get into water gardening without all the mystique and, under Alan's guidance, you could be the proud owner of a water garden in a very short space of time.

**DICK MILLS**

## Fish of Britain and Europe

Author: **Peter J. Miller  
and Michael J. Loates**  
Publisher: **Collins**  
Price: **£12.99**  
ISBN: **0-00-219945-9**

Compiling information (and illustrations) on species of fish found from Iceland and the North Cape, the continental shelf (and mainland) of Europe through the Mediterranean to the Black Sea is a formidable task, but that is just what this work comprises.

With holidaymakers travelling to all manner of destinations, those aquarists (and even anglers) amongst them will come across many species of fish in the course of their travels.

Identifying such species 'on the spot' may be difficult but with this book packed in the suitcase you can quickly access the information and come up with a more than likely name tag.

Two separate 'Key' lists (Marine/Estuarine Fishes and Freshwater Fishes) provide illustrations to enable you to get roughly in the right 'ball park' for a start with differing groups of fishes (over 750 species in all) being shown according to shape and certain relevant physical characteristics.

On each species entry there is a map showing distribution (some include migrants from Indo-Pacific areas via the Suez Canal) together with description on habitat, physical characteristics, breeding, etc. Of course there is a clearly-created illustration (by Michael Loates)

drawn from life in the majority of cases.

Knowing of Peter Miller's fascination with Gobies over the years, the reader should not be surprised to find this family well and truly described so, the next time something wriggles between your toes in a summer rockpool, there's a fair chance you can identify it with the help of this book.

A valuable, and almost bargain-price, book for all those interested in aquatic life in our rivers, lakes, shoreline and seas.

**DICK MILLS**

## SEALIFE — A Complete Guide to the Marine Environment

Editor: **Geoffrey  
Walker**

Principal Contributors:  
**Marc Dando and  
Michael Burchett**

Publisher: **Pica, 1996**  
Price: **£30.00**  
ISBN: **1-873403-26-7**

Although I am sure that a few marine aquarists get hooked on the hobby for the sheer beauty of the reef fish, the serious and successful aquarist will develop or reinstate a latent interest in the sea itself. For both the novice and the newcomer the above book represents a very thorough introduction to the oceans of this planet and the all the animals from the plankton to the whales that live in the sea, as well as the many seabirds.

Some readers may find the sheer bulk of information a bit daunting, but this is a reference book not a coffee table book with lots of colour pictures. Inevitably it is a large book with 504 pages (240 mm x 160 mm) pages, with excellent scientific illustrations and 56 attractive colour plates.

Photographs are absent apart from a breaching Humpback

Whale on the front hardback cover.

The book is divided into sections explaining about Oceanography and Marine Biology and Habitats with a much larger section called Identifying Marine Life with large selection of animals from all the oceans. The Rocky Temperate Shore plates features fauna from North West Europe and from the same side of the Atlantic Ocean the Temperate Sea Fishes are also included. There are two full page colour plates devoted to Reef Fishes.

There is a very brief mention of scuba diving and microscopy but nothing specifically on marine aquarium study. If you are only going to buy one book on the oceans this is an excellent first choice and at £30 is extremely good value. Highly recommended.

**ANDY HORTON**

## Interpet Book of the Water Garden

Editor: **Philip Swindells**  
Publisher: **Interpet**  
Price: **£29.99**  
ISBN: **n/a (Interpet  
Product Code 0090)**

When the jacket of this book is emblazoned with the words 'The Ultimate Guide to the Design and Maintenance of the Water Garden' the reader is surely entitled to anticipate something special between the forthcoming pages. You will not be disappointed.

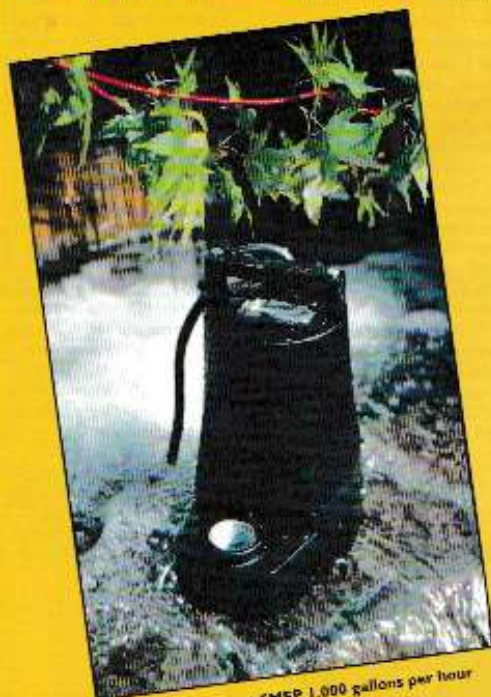
The author already has a sterling reputation for his work in aquatic horticulture and is currently International Registrar for Cultivated Nymphaea (Water-lilies) and Nelumbo (Lotus). He also possesses that extra gift of being able to communicate lucidly his accumulated knowledge whilst at the same time has the ability to put his thoughts into coherent

► CONTINUED ON PAGE 98



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

## Pump product launch



The new Little Giant SMSP 1,000 gallons per hour submersible pump.

Nottingham-based W. J. Furse & Co Ltd have announced the first in a series of product launches and upgrades.

The Little Giant New SMSP Submersible Pump pumps around 1,000 gallons per hour and is the biggest selling Little Giant pump in the range. Designed specifically for garden ponds the 1,000 gallons per hour delivered by the SMSP is ideal for most garden pond applications.

The new model SMSP has a range of important upgrades including a new high-performance, low-energy consuming motor and a new design double-seal — all designed to improve performance, reduce running costs and extend pump life. The new SMSP is bound to be a big winner with water gardeners and pond keepers everywhere — AND the price is right so check out your local aquatic dealers soon. More information on the new pump or distributor enquiries to: W. J. Furse & Co Ltd, Wilford Road, Nottingham NG2 1EB. Tel: 0115 986 3471. Fax: 0115 986 0538.

## Cichlids on the net

Cichlid Press, publishers of Ad Konings books and videos on cichlids, now have a site on the Internet at <http://www.cichlidpress.com>

## New product brochure



Nitritech, one of Europe's premier modular filtration system designers and manufacturers, have launched their latest info-packed, full-colour brochure and filtration design guide. The brochure details the entire Nitritech range and offers practical design assistance for serious Koi and pond keepers looking for a new or upgraded filtration system.

Nitritech systems are sold worldwide and have consistently demonstrated their capabilities to deliver premier water quality over many years. The only test that really matters is delivered performance and thousands of Nitritech users can't be wrong which is why Nitritech filtration systems are the fastest selling in the market.

For a copy of the excellent Nitritech brochure or to discuss your specific requirements

contact: Nitritech, Sunbeam Nurseries, 119 Bristol Road, Frampton Cotterell, Bristol BS17 2AU. Tel: 01454 776927. Fax: 01454 250753.

## Competition Winners

The winners of the GROCKLEMANIA STARBREAK WEEKEND as featured in the March issue of A&P were: P. and T. Wilkins, West Ewell, Surrey.

## HOZELOCK COMPETITION HOZELOCK SUPER CASCADE 2000LV

Mr R. Taplin, Hythe, Kent; Mrs V. Frisk, Truro, Cornwall; T. E. Critchlow, Leyland, Lancashire; C. Clifton, Hasley, Doncaster, South Yorkshire; A. Guthrie, Kirriemuir, Angus, Scotland.

## Fishy goes on at 'The Barn'

Regular visitors to Koi Water Barn, in Orpington, Kent, have noticed strange things happening over the past couple of months. Amidst the noise of drilling and hammering (and the odd unrepeatable word), racks of glass tanks have appeared in a corner of 'The Barn' once reserved for small pond filters. Boxes of non Koi related items began arriving, and then suddenly in moved the new inhabitants. The K.W.B. Fancy Goldfish department was born.

After 12 years of being a "Koi

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

only' outlet, Koi Water Barn have decided to branch out.

Renowned for their High Grade Japanese Koi, they intend to maintain the standard with the Fancy Goldfish, buying in only hand selected Chinese and Japanese stock. As well as high-quality fish, there will also be a varied range of related dry goods such as tanks, cabinets, filters, foods, plants and much more. Experienced staff will be on hand to help with queries and to offer advice on choosing that perfect specimen. Please phone for details.

The Koi Water Barn is open seven days a week and can be found at: Lilly's Farm, Chelsfield Lane, Chelsfield Village, near Orpington, Kent BR6 7RP. Tel: 01689 878161. Fax: 01689 877554.

## Outbreak of Spring Viraemia of Carp

The Ministry of Agriculture, Fisheries and Food has confirmed an outbreak of SVC (Spring Viraemia of Carp), a contagious viral disease of fish, in three fisheries in Kent, West Sussex and Nottinghamshire.

SVC can have a devastating effect on fisheries, and all fisheries managers, as well as fish importers and dealers, are reminded of the need to take strict precautions against the spread of this disease. It is a contagious viral disease which affects Common Carp and its ornamental varieties, in addition to other species including Goldfish, Tench, Pike and Wels Catfish. It often results in significant death rates. The disease is widespread in continental Europe. In 1988 there was a major outbreak in England and Wales, with 40 sites affected. Prior to 1988 only four cases had been recorded in Great Britain. There were two isolated cases in 1991, 22 in 1994, 14 in 1995 and three cases in 1996.

SVC is a notifiable disease under the Diseases of Fish Act 1937 and MAFF has made an Order prohibiting movements of fish to and from the affected sites. MAFF is investigating the source of the outbreak and

tracing fish which may have come in contact with the infected fish at the sites.

Importers, dealers, traders and fishery managers are advised to follow the advice set out in MAFF's advisory booklet 'Combating Fish Disease' available free of charge from the CEFAS, Weymouth Laboratory. The Nothe, Barrack Road, Weymouth, Dorset, DT4 8UB. Tel: 01305 206673/4. Fax: 01305 206602. Anyone noting deaths of carp or any other species of fish susceptible to SVC should contact the CEFAS, Weymouth Laboratory.

## Hozelock combines with retailers to provide support to consumers

Leading water garden equipment manufacturer Hozelock has extended its high level of customer service and support with the implementation of 'Service Centres' at selected retail outlets throughout the UK.

Service Centre retailers make a commitment to service any Hozelock 'Super Cascade' pond pump which they sell, after one year of the pump's use, and at no charge to the consumer; while they also commit to answer consumer enquiries, on a referral basis, with service centre contact details being made available to consumers by Hozelock.

Each participating service centre has been issued with a Super Cascade pond pump spare parts kit to enable on-the-spot repairs and maintenance to be carried out as and when necessary.

Point-of-sale material has been issued, to advertise a store's participation as a Service Centre, and this incorporates display cards, self-adhesive Service

Centre stickers, free service information leaflets, and pond pump service cards.

Remarked Richard Bradley, marketing manager of Hozelock Aquatics: "Our intention is to work together with retailers to provide a high standard of service to customers. By supplying information and by encouraging regular checks on equipment, we can help to ensure consumers' continued satisfaction and enjoyment from their pond and pump. The Service Centre scheme further enhances Hozelock's reputation for quality of product and support throughout the trade and with consumers."

For further information, please contact: Hozelock Ltd — Aquatics Division, Haddenham, Aylesbury, Bucks HP17 8JD. Tel: 01844 291881. Fax: 01844 290344.

## Free display pallet!



Following the extremely successful introduction by King British Aquatics of the new Pond Pride range which includes Super Premium foods, Value foods and a totally comprehensive range of Water Treatments for ponds, the Petindex exhibition saw the

launch of fully merchandised pallet displays for the most popular 'Value Pack' sizes of the pond foods.

Specially designed to offer a sensible quantity of packs and not take up too much valuable floor space, they are made from durable, water proof Correx, and come ready merchandised for immediate positioning in store to promote high volume sales.

Display pallets featuring Floating Food Sticks, Ultimate Koi Food and Ultimate Pellet food are all available, as are mixed displays for retail outlets where space is at a premium.

"These display pallets have been proved to increase sales and have been requested by many retailers," said Sales Director Stuart Hendry. "We are pleased to be able to offer this extra service to our valued customers."

For further information contact: MICHAEL SINCLAIR, King British Aquatics Ltd, Haycliffe Lane, Bradford BD5 9ET. Tel: 01274 573551. Fax: 01274 521245.

## Aqua Geographia is back

'Aqua Geographia', the aquatically-oriented natural history magazine, and its sister publication, the scientific journal 'Aqua', are now available again following a long break due to a change of publisher from Aquaprint in Germany to Fulcro SAS in Italy. The editorial team remains virtually unchanged, and the gap in publication has been largely due to the need to move the magazine and its staff halfway across Europe.

Both publications are available in the UK from AG Publishing, 1 Copper Oak, East Village, Crediton, Devon, EX17 4DW. Tel/Fax 01363-866509. Email 106326.3671@compuserve.com, as are books, videos, and posters formerly distributed by Aquaprint.

Issue 14 of Aqua Geographia is now available, and can be previewed by Internet surfers at <http://www.petsforum.com>

## Grocklemania '97

By Dr David Ford of  
Aquarian Advisory Service

The Isle of Wight Aquarist Society held their Open Show and Grocklemania Weekend at the Haven Holiday Centre in Puckpool, near Ryde, Isle of Wight, on May 16-18. On the Sunday day visitors brought fish for the Open Show and some 200 aquarists viewed 263 entries. There were lectures by Mike and Gina Sandford with their light and sound displays, plus 'Fossil Fish' by palaeontologist Martin Hunt.

Trade stands in the Camp's Ballroom included Hagen, Aquarian, BTC Trophies, Wight Reptiles, RSPCA, FBAS, Island Amazon and the usual tombolas, raffles and a photo display of Grocklemania '96 by the IoW Society.

A heat of the Aquarian AquaChamp competition was won by Keith Mower of Erith AS, whose Club also won the



Thomas Crapper Award for the third year running.

FBAS President Jack Stillwell presented Hagen's Peter Sykes with a special certificate for his help with promoting Grocklemania and Jack also presented all the prizes to the Class Winners.

### Results

**Best Fish in Show:** L. Pearce of IoW A.S. with a Bristol Shubunkin.

**Best Livebearer:** M. Blackie of Erith A.S. with a Swordtail.

**Best Breeders:** G. Randall of Solent A.S. with a A. somersleyi.

**Best Junior:** L. Powell of Erith with a Darter.

**FBAS Championship Class Winner:** G. Thwaites of Erith A.S. with a L. jankowskii.

**Highest Pointed Society** was Bracknell A.S.

**Aquarian Junior Painting Competitions** were won by Joshua Symmons, Harry Groves, Tommy Milington, Craig Brannon and Nichole Whiddett.

### Class Winners

Class Letter B, Chas Raggio, Class Letter C, Chas Raggio, Class Letter Ca, Tony Tyson, Class Letter Cb, Paul Whiddett, Class Letter D, Keith Sollitt, Class Letter Da, Keith Mower, Class Letter Db, Tony Tyson, Class Letter Dc, Stan Leacock, Class Letter E, Keith Sollitt, Class Letter Fa, Keith Sollitt, Class Letter F, Steven Elliott, Class Letter G, Dave Holyoake, Class Letter Gbd, Roger Crew, Class Letter H, Tony Tyson, Class Letter Hab, Keith Sollitt, Class Letter J, Roger Crew, Class Letter K, Tony Tyson, Class Letter L, Gary Thwaites, Class Letter La, Tony Tyson, Class Letter M, Dave Holyoake, Class Letter Mb-M, Chas Raggio, Class Letter No-T, Gary Randall, Class Letter Nu-W, Ruth Whiddett, Class Letter P, Alan Stevens, Class Letter P, Mick Blackie, Class Letter Q, Tony Tyson, Class Letter Qa, Mick Blackie, Class Letter R, Steven Elliott, Class Letter Rab, Dave Holyoake, Class Letter S, Tony Tyson, Class Letter T, Tony Tyson, Class Letter Uad, Mary Frankie, Class Letter Ubc, Les Pearce, Class Letter V, Les Pearce, Class Letter W, John Powell, Class Letter Xb-M, Roger Crew, Class Letter Xd-T, Gary Randall, Class Letter Z, Keith Sollitt.

## Association of Southern Aquarists' Societies

The Fourth Annual ASAS Fishkeeping Convention will be held at 11.15am at the Bucklands Community Centre, Malins Road, Portsmouth on Sunday, 17 August.

The Speakers will be Justin Bell of Chester Zoo and Stan Langdon. Included in the £5 ticket price will be a Buffet Lunch and Auction of Fish and Aquatic Goods, plus the opportunity to meet and chat with fellow aquarists from the surrounding areas. Tickets are available from: Southampton (Alan Stevens 01703 904200); Portsmouth & Hants (Jack Stillwell 01705 691030); Surrey (Bill Slade 01444 232347); Isle of Wight (Les Pearce 01983 613575); Sussex (John Smith 01273 602467).

## Association of Aquarists Superbowl News

The new series of Aquarian Superbowl Shows, held to Association of Aquarists Show Rules, started on 25 May 1997 at the Show hosted by Tongham Aquarists at Mychett Community Centre. In a change to previous years the Annual General Meeting in November will see a revised showfish final called the Superfins Finale. This will invite the best three fish from each of the Aquarian Superbowl Shows along with any outstanding exhibits nominated by judges on

the day. Also included will be the Best Coldwater Fish from each Show.

Shows will be held on the following dates and venues:  
6 July, Amersham Community Centre, TV Cats Group, Chris Ralph. 01256 363220.

24 August, Swallowfield Show Tent (between Reading and Basingstoke), Swallowfield Show, Judith Aymer. 01256 353793.

7 September, Kennington Community Centre, South London A.S., Sue Bungay. 0171-231 0385.

12 October, Kempshott Village Hall, Basingstoke A.S., Chris Ralph. 01256 363220.

For further information about the Aquarian Superbowl Shows, contact our new Superbowl Co-ordinator, Sue Bungay on 0171 231 0385. For more information about the Association, contact Adrian or Judith Aymer on 01256 353793 or Chris Ralph on 01256 363220.

## DIARY DATES

### JULY

1 Gloucestershire A.S. Bell & Gavett, Cattle Market, St Oswald's Road, Gloucester. Talk on Showing Fish by Joe Peto, and Table Show judged by members. Contact Andy. 01452 372948, or Christine. 01262 520428.

13 Washington & D.A.S. 12.30pm-6pm. Auction of Fish and Related Items. Nissan Moor Co Sports & Leisure Facility, Washington. Lots booked in from 11am. Refreshments, Raffle and Bar. Contact Alan Raza. 0191 417 0768.

19 GSGB. 2.30pm. Meeting of the Goldfish Society of Great Britain, YMCA, Barbican, London. Subject: 'The Serious Beginner - Part II: Equipment', by John Parker. Further details from the membership secretary, Roger Sabroski. 0181-550 1252.

20 Oasis Fish Club Auction. Hemsley Park Community Centre, Monkwearmouth, Sunderland. Club meets on first Wednesday of each month. Contact Avril Banks. 0191 384 1433.

27 Kent Association of Aquarists Societies (KAAS) Open Show. Village Hall, Manlyan, Kent.

## OPEN SHOWS

18th London A.S. = A.S. of A.  
18th LEAS. (N) = N.A.S.  
18th = B.A.C.  
18th = International Quality Standards = I.Q.S.  
18th = A.S.A.C. = A.S.A.C.

5 July Fort Taber A.S. (FB)

20 July Gloucestershire A.S. (FB)

27 July Kent Association of Aquarists Societies (FB)

10 August Whitley A.S. (N)

24 August 3pm Two Area Association (FB)

30/31 August Fishworld '97, Dronkale (FB). Kent Show. National Junior Fishkeeper's Open Show (FB). British National Open Show (incorporating British Open Fish Championship).

31 August Crumlington A.S. (FB)

13 September Hounslow A.S. (FB)

14 September Silkdown Show Team (FB)

28 September Darwin A.S. (FB)

12 October Solway A.S. (FB). W.A.S.P. (FB)

25/26 October British Aquarists Festival, George Cernell Leisure Centre, Manchester (FN)

31 October/2 November Supreme Festival of Fishkeeping, Weston.

1 November National Junior Fishkeeping Open Show (FB)

7 November Supreme Championship & Open Show (FB)

◀ CONTINUED FROM PAGE 90

order with the resulting book that leaves absolutely nothing out concerning water gardening. The fact that, in the Introduction, he describes himself as an 'aquaholic' also means that he brings a self-evident enjoyment into his writings with an enthusiasm he is determined to share with, and pass on to, others.

There are six main chapters — Water Garden Design, Building a Pool, Waterfalls and Streams, Special Features, Stocking the Pool and Water Garden Care. The first includes Principles of Water Gardening, Water Garden Styles (from centuries BC through to modern-day formal, informal and semi-formal settings), Koi Pool, Water for Wildlife, Natural Water Garden, Bog Garden, Streamside Water Meadow, Indoor Pool, Moving Water and, with perfect circumspection,

## BOOK REVIEWS

### Considering your Budget.

Now you've got the picture and comprehensiveness of the approach you can imagine how the remaining chapters shape up, each containing almost infinite variations on its main theme from ideas to constructional details. It should be pointed out that Stocking the Pool includes a major section, the Plant Directory, and a short Fish Directory.

Getting to grips with the effects of living organisms in the pool is often where new water gardeners find problems, especially when they are expected to accommodate such new ideas as are to be found in water movement and water management. Again, the author puts over the vital basic principles without getting over technical. Which is where the blue pages come in.

Thinking blue (in the mood, rather than colour sense) infers sadness or worry. This hue has been chosen (deliberately!) as the background paper colour on which is printed 'problem-solving' guidance — each chapter has such a section.

Finally, what will really 'sell' the book is its initial appearance: true to the long-standing Salamander Books/Interpet reputation, the quality of production is quite sumptuous. Although the most artistic photograph can elicit powerful emotional feelings there is nothing better than well-drawn diagrams to convey accurate, constructional information — after all, when did you last see mud-spattered, construction-in-progress artwork? Destined to become another 'classic' for the aquatic bookshelf and to increase the number of successful ponds by leaps and bounds.

DICK MILLS

Dear Sir,

Having recently 'inherited' an aquarium and cabinet (30in) I decided to try my hand at tropical fishkeeping. As well as fish I wanted also to have some plant growth in my final set-up. Before embarking on this project I did a reasonable amount of 'homework' and thought I had covered most points.

The big day came and I went to a local dealer to purchase some equipment including a filter. I decided not to go for undergravel because I had read that plants do not really appreciate the constant water flow over their roots. I did think I would buy an external filter but when it came to looking at some I decided against it because it would have meant cutting away a lot of my aquarium hood in order to get the pipework to fit neatly. It's strange that every company advertising external filters never show them with an aquarium hood in situ and I'm sure a lot of people only find out the 'hassle' in fitting after they have made their purchase.

Anyway, I eventually went for an internal model that had a small section in it for activated carbon or zeolite, or whatever else you wish to add. I read the instructions and it appeared that the carbon supplied with the filter could only be beneficial. I got my new 'goodies' home and set

## Letters to the Editor

things up with some nice new plants and eventually got things up and running.

That evening I thought I'd just relax and have a quick browse through my fishkeeping magazines in case I had missed anything. Lo and behold, I came across an article on plant growth by your Barry James. I felt annoyed with myself because I had already read this item before but had totally missed the piece about carbon. Barry stated that if you wish to grow plants your filter should not contain carbon as this can remove plant nutrients and thus stunt plant growth. I could not believe it and felt disappointed that the instructions with my new filter made no mention of this. I immediately wrote to the manufacturer on the subject of carbon in filters and plant growth. They replied, stating that they saw no problem with the use of activated carbon in conjunction with plants and knew of many very successful planted aquariums where it is used permanently and do not accept that it should not be used with live plants. But

they did suggest using carbon occasionally to remove organic dyes, say for two days every month, and to use regular additions of plant food.

As you can imagine I found it most confusing when new to a hobby to find two sources (whom I have no alternative but to respect) having such opposing views. I wonder if anyone could offer me any further comments in an effort to settle this argument? I still feel rather annoyed that the filter did not contain more specific instructions about the use of carbon and it seems to me the manufacturers are trying to 'back it both ways' with the theory of the twice a month system.

I was wondering if it would be a good idea for your magazine to warn newcomers to the hobby to beware of the lack of information with some products — I know it would be impossible for you to mention names and I would not wish you to do so.

David N. Rose,  
Cambridgeshire.

Editor's Note: Yet again we are reminded of the many

'variables' existing in the closed systems in which we expect our fish (and plants) to thrive. As each process has an automatic effect upon other areas (see Fishkeeping's Hidden Agendas, A&P, August 1996) it is certainly advisable to do as David did and research as much as possible in advance of making any changes. If you have views to share on the topic outlined in this letter do let our readers benefit from them.

### HELP REQUIRED!

A reader has been in touch wanting to obtain extremely tiny first foods for fish he is breeding. Apparently, the usual 'fry foods' (either liquid-based or newly-hatched Brine Shrimp size) are too large for his purposes. If anyone can let us know of such foods — either 'self-culturable' or from commercial sources — that they have had success with, we will pass on the information for the benefit of his babies and his nerves!

Letters for publication  
should be addressed  
to: The Editor, A&P,  
MJ Publications Ltd,  
Caxton House,  
Wellesley Road,  
Ashford,  
Kent TN24 8ET