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## PRICE INCREASE

We regret that, as from this month, we have had to raise the cover price of *A&P* to £2.00. This increase is entirely due to paper costs which went up by a considerable amount in January.

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## EDITORIAL SPRING PREDICTIONS

It's time to welcome 1995, although predictions, alas, sometimes come with a price. From 1992 I used to write you on both *Seaview* and *Interpet* but now, alas, I have only one page available for the coming calendar edition.

I don't intend to write features and predict for the 1995 year the coming month. The *Seaview* feature is a fish of month column for each month, so I've been watching that column for a while with a great deal of pleasure over the past few seasons.

The March column featured *Amphiprion* in the column and the first history of these little fish was written by the author of the column, *Amphiprion* in the UK. The 1995 year has been the last history column from the health column.

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*John Dawes*  
John Dawes



# TOMORROW'S AQUARIST

BY GINA SANDFORD

## BUG OF THE MONTH

I've yet to find somewhere that these little creatures have to colonize — they'll bite you in the desert, in the jungle, in cold northern latitudes and in your own backyard. It seems that no matter where you are, one of the many species of mosquito is out to get you. So, let's turn the tables on them and feed them to our fish because, at each stage of its life, the mosquito is useful to the aquarist.

### 1. Egg rafts

Some species lay their eggs singly, others, such as the members of the genus *Culex*, produce egg rafts. These are small and float on the surface of the water. They look like tiny pieces of old leaf but on closer inspection you can see the eggs stuck together. They can be scooped up and floated in the aquarium so that very small fishes can eat the larvae as they hatch.

### 2. Larvae

As they grow, these can be fed to larger fishes. Larvae need to surface to breathe and can be netted at this time.



### 3. Pupae

At the same time as you catch the larvae, you are almost certain to net some pupae. These hang at the surface looking like commas in the water. At this stage, the wings of the adult insect are clearly visible through the skin. Be sure to feed pupae as soon as possible, because they only remain in this stage for 24-48 hours before they hatch out into the adult mosquito.

### 4. Mosquitoes

Even the adults can be used to feed surface-dwelling fish or Archer Fish. They are excellent food for bringing fish into spawning condition. Usually, it is the female mosquito that does the biting, the rich blood providing her with all the proteins she needs to reproduce.

Photographs — by Mike Sandford



## Planting tips

When you bring home plants for the aquarium, there are one or two things that you should remember:

① The plants are tropical species and, just as tropical fish should not be chilled, neither should the plants. Keep them warm on the way home and never put them into cold water — it may kill them.



Plants, thoughtfully arranged, provide pleasant restful environments for our fish, often allowing them to be seen at their best.

② The temptation to plant unrooted cuttings in a bunch is great — it would give you an instant aquarium full of plants — but for how long? Crushing delicate stems together and plunging them into the gravel bruises the plant tissue and leaves it open to infection. Rot may set in and the plants may die. Likewise, wrapping strips of plant weights too tightly round the stems can have the same effect. Treat your aquarium like garden plants. Plant each one individually and space them out so that the light can reach all the leaves. Stagger the rows and, when viewed from the front of the aquarium, you will have a wall of healthy plants.

③ Use some specimen plants such as Amazon Swordplants, but remember that they grow quite large and need plenty of space. The root run from a well established specimen can cover the whole of the aquarium.

## Gourami Gossip

Here are a few bits of info relating to Gouramis and their closest relatives.

Did you know that:  
① The wild form of the Siamese Fighting Fish — a cousin of the Gourami — is called Luat Fing in Thailand? This name means *climber of the rice paddies*.

② The Climbing Perch will travel across land from pond to pond?

③ Some species of labyrinth fish can survive the dry season hidden away in moist pockets in the dried-up stream or pond bed?

④ Bushfish have saw-like teeth (arrational) on the edge of the gill cover (operculum)? So, take care when netting these fish, as they easily become entangled.  
⑤ When spawning, Dwarf Gouramis produce between 300 and 700 eggs?

⑥ In the wild, the Combtail is found among plants in small, clear streams with soft, slightly acidic water?

⑦ The Kissing Gourami is a plankton feeder? It's a good job that it takes flake food from the surface, otherwise we'd have problems keeping it in captivity.

⑧ The common name of Labyrinth Fish comes from the accessory breathing organ that these creatures possess? This is situated above the gills, behind the gill cover, and allows the fish to survive in oxygen deficient waters.

⑨ If using potted plants you have two choices:

(a) Plunge the complete pot into the substrate and allow the plant's roots to grow out into the gravel, or

(b) Take the plant out of the pot and gently ease away the growing medium from the roots before planting in the aquarium.

Personally, I take the (b) option. I've never yet managed successfully to conceal one of the growing baskets in the aquarium to my satisfaction, and I don't like the medium that the plants are grown in — the rock wool makes my fingers itch, so Heaven know what it does to bottom-dwelling fishes. Then, the medium — which resembles paper mache — gets dug out of the pot, and scattered around the aquarium by fish. I have also discovered that Cryptocorynes that look like one fairly large plant in the pot, turn out to be several small ones bunched together. I split them up, space them out and get real value for my money!

Plants are worth taking a little time and trouble over. Just don't expect the instant furnished aquarium.



# Tetra TA COMPETITION

## GIVE YOUR FISH A TREAT

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- 1 Which fish has the scientific name *Pterophyllum scalare*?
- 2 Name one of Tetra's other tablet foods.
- 3 What colour is the lid of Tetra Tips tub?

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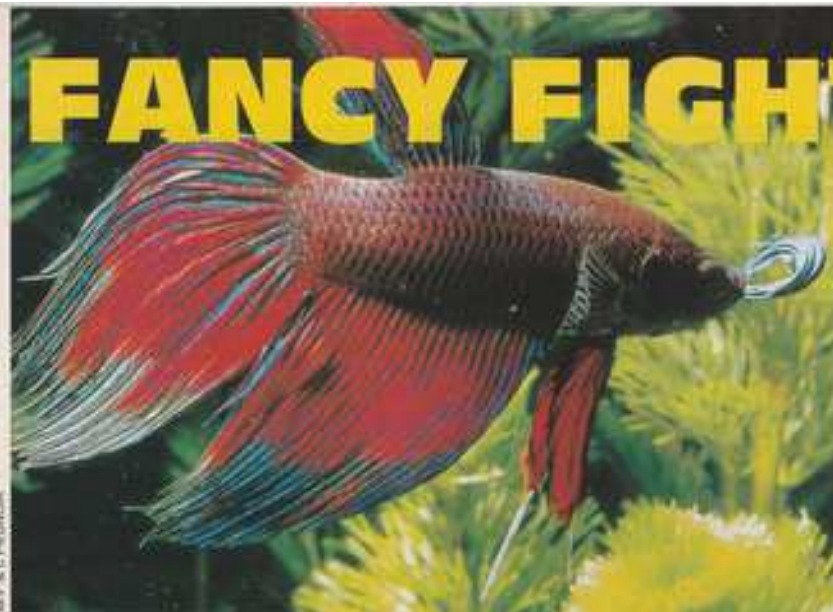
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# FANCY FIGHTERS



M.P. & C. PRODCOR



M.P. & C. PRODCOR

**LEFT** — This male is swimming off with a fragment of caudal (tail) fin which he has bitten off a rival.  
**RIGHT** — A brilliantly coloured long-finned male.

**T**he Siamese Fighting Fish — now usually referred to as the Siamese Fighter — has been a popular aquarium fish for many years. However, due to the aggressive nature of the male and its seemingly very short lifespan, many community aquariums contain only the less attractively coloured females. This is a great shame, because when kept in favourable conditions, males bring a spectacular 'flash' of colour to any set-up . . . and without the aggression so often associated with them.

## The species

The Siamese Fighter belongs to the family Belontiidae, commonly (and incorrectly) referred to as 'Anabantids'. The name 'Anabantid' means 'to journey up', which is not surprising as all anabantoids are capable of, not only using dissolved air in water, but also of 'gulping' air from the surface. This is due to the fish possessing an 'accessory' breathing organ (the labyrinth), which allows them to store air in a special chamber behind the gill cover.

The species *Betta splendens* was first described scientifically in 1909, but records show that it was kept in aquaria as early as 1874 under the species name *Betta pugnax*.

It is difficult to tell what the original wild form of the Siamese Fighter looked like, due to the fact that the species has now been so domesticated that the forms seen today are often vividly coloured and possess highly enlarged caudal, dorsal and anal fins. The original fish is thought to have been plain, either being brown or black in colour.

The female tends to be less colourful than the male, with less exaggerated finnage and being generally plain in colour, with faint stripes. The male has the same general body shape as the female, but with highly developed dorsal and anal fins, similar in shape to each other; they also have a rounded caudal fin.

**Roger Foggitt** of the Tetra Information Centre looks at the Siamese Fighting Fish, often overlooked due to its aggressive name, but a colourful addition to any community aquarium . . . when kept correctly.

Colours vary enormously, from bright red with a bluish green iridescent tinge, to 'electric' blue with red and green tinges to the edges of the fins.

The Siamese Fighter originates in the Far East, Malaysia and Thailand, where they are found in many types of freshwater habitats, such as running and standing waters, irrigation canals and paddy fields. There are also reports of a 'wild' (feral) population in Colombia.

Fish available to the hobbyist are generally tank-bred specimens from farms in South-east Asia and are available in many colour varieties.

## Choosing Fighters

The choice of fish is really down to preference of colour type. Females are generally kept together in aquariums, as they are peaceful and not at all pugnacious. For both sexes, body shape should be good with no damage to the fins or scales.

The males of the species are extremely aggressive to one another and will, if kept together in the same aquarium, actually fight to the death. Due to this behaviour, they cannot really be kept together and, before sale, are often kept in small aquaria, usually stored in rows next to each other.

Although they cannot, obviously, fight in this situation, if the males, after separation, can still see each other through the sides of the containers, they will conti-

nually display to each other, just as they do in the wild if a confrontation takes place. This continuous displaying often leaves them in an extremely stressed and exhausted state. The consequence of this is that, once introduced to the aquarium, they will continue to display to all other occupants, even those not of the same species, often being aggressive towards them, hence their unjustified reputation as unsuitable community tank occupants. This may also account for the relative short life of some males in captivity.

Choose your fish carefully then, picking a well-coloured male that shows no signs of stressful behaviour, i.e. one that is peaceful and relatively inactive.

## Captive care

Once in the aquarium, looking after Fighters should pose no major problems. Due to extensive captive breeding, the fish can tolerate relatively high fluctuations in water quality parameters and will generally accept most types of dried flake and pelleted foods.

These fish are relatively temperature-sensitive, though, and should be kept at a minimum of 25°C (77°F); for breeding, this should be raised to somewhere between 28 and 30°C (82-86°F).



M.P. & C. PRODCOR

Even in commercially developed varieties female Fighters have much shorter fins than males.





KEVIN WEBB

Magnificent wild male *Betta splendens*.

General water quality parameters should be: pH 6-8, General Hardness 1 to 25° dH, ammonia 0 mg/l, nitrite 0 mg/l, nitrate 1 to 50 mg/l.

The Siamese Fighter is a relatively inactive fish, giving you longer to view its impressive finnage and colours. This allows these fish to be kept in aquariums of most sizes, but it is recommended that a minimum length of 18in (45cm) is used. A well planted aquarium is best, as the females prefer places to shelter from the advances of amorous males.

The fish will grow to a maximum size of 6cm (2in), making it suitable to keep with many fish species of the same size, but avoid fin-nipping species such as Tiger Barbs, as the fancy fins of the male Fighters make an attractive target!

Remember that it is not recommended to keep more than one male in the aquarium, as they will inevitably confront each other and fight, often to the death of one or both of the individuals. Numbers of females should outnumber the male by at least two to one, as a single female will tend to be harassed. Having two or more females generally pacifies the advances of the male, as he seems unable to make up his mind as to which one to chase.

## Feeding and breeding

Siamese Fighters are generally omnivorous fish and will therefore accept many good-quality flake foods, although when attempting to breed these fish, a supplement of live foods such as *Daphnia*, blood-



KEVIN WEBB

Female wild Fighter under a bubble nest.

worm and brine shrimp to keep the fish in condition is a good idea.

Fighters are bubble nesters, with the nest being built by the male at the water surface from bubbles of air coated in mucus. To this layer of bubbles are added small fragments of plants and floating debris which help to keep the nest bound together. The nest is affected by surface water movement, so the breeding aquarium should be filtered by a simple, slowly operated sponge filter to minimise the risk of destroying the bubbles.

The breeding tank should be well planted with fine-leaved plants such as *Gabomba* to give the female plenty of hiding space and to act as a building

## FIGHTER FACTFILE

Scientific name:	<i>Betta splendens</i> .
Maximum size:	Up to 6cm (2in)
Origin:	Far East, Malaysia and Thailand.
Water requirements:	Tolerant of a range of pH and hardness. Sensitive to fluctuations in temperature. Minimum of 25°C (77°F) for normal upkeep, but 28-30°C (82-86°F) for breeding.
Feeding:	Good-quality flake foods (live-foods as a supplement).
Sexual differences:	Males have striking coloration and finnage; females are less colourful, with less extensive fins.
Breeding requirements:	Bubble-nester. Ensure little agitation at water surface. Keep males and females apart before introducing them into a well planted breeding tank. Fry hatch after 24 hours and are free-swimming after 2 days.

medium for the bubble nest.

The breeding pair should be conditioned separately for several days on a rich diet of flake and livefood before being introduced into the breeding tank. Once introduced into the tank, there should be no problem in getting the pair to spawn.

The male will busy himself constructing the bubble nest, after which he will attempt to entice the female to the nest. The couple then go through a fascinating courtship 'dance'. This begins with the female gently prodding the male in the side with her snout, followed by her wagging her body in front of the male.

The male will then attempt, often clumsily at first, to curve his fins and body





KEVIN WEBB

Double-tailed or Split-fin Bettas are not seen all that often.

around the female, surrounding her and turning her so that her underside is uppermost. This often takes one or two attempts to get right, but once the fish spawn, the eggs — unlike those of many other species of bubble-nester whose eggs float — will sink towards the bottom of the tank. Often, eggs are caught on the anal fins of

both fish and these, plus any escapees reaching the bottom, are collected by both parents and inserted into the nest. Approximately 40 eggs are produced at each pairing, making a total of about 200. After all the eggs are deposited among the bubbles, the male will guard the nest, soon becoming very aggressive towards

the female. It is therefore a good idea to remove the female from the breeding tank after all spawning activity has ceased.

The eggs take about 24 hours to hatch and, at this time, the fry rely on their yolk sac for food, often sinking, only to be gathered up by the male and then being unceremoniously 'spat' back into the nest. After two days, the fry become free-swimming, at which time the male should be removed to prevent him eating his offspring.

The fry should then be introduced to a diet of rotifers or fry foods fed at least 3-4 times a day, feeding in excess to ensure a fair share is had by all. Beware, therefore, that water quality does not diminish! As the fry develop, larger food items, such as newly hatched brine shrimp, can be used until such time as they can be weaned onto flake foods.

### Problem-free Fighters

If the general rules for the care of the Siamese Fighting Fish are followed, they should give many years of pleasure to the aquarist, without the aggressive nature of the male ever becoming a major problem, and with the bright colours and fascinating breeding behaviour of the species adding to its allure to fishkeepers everywhere.

Remember, though, never keep males together . . . and always keep single males with a higher number of females, unless in a breeding situation. **BBB**

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# SEA VIEW

BY GORDON KAY



## Important choices

I have written a great deal about the difficulties encountered when keeping coral fishes. Now I can write about something which is probably the most important decision of all in our seawater aquarium careers: what we keep.

What we keep in our aquariums may not seem to matter much, but this issue has far-reaching implications, not only for our success, but for the well-being of the animals.

Basically, there are three types of aquarium community from which to choose. We could keep an aquarium housing **only fish species** — from which there are many to choose — or we might decide that an **invertebrate aquarium** is for us. Invertebrates (commonly called inverts) are animals without backbones. We are talking anemones, shrimps, corals and crabs here. All types of animal which, along with living rock (rock taken from the reef — or artificially cultured — together with all its attendant algae, tiny worms and other burrowing animals), can be kept to form our own little coral reef in the sitting room.

Many newcomers to the hobby are tempted to keep things which they really shouldn't, in a sort of 'turning before they can walk' phenomenon. In this way, many try to keep a **mixture of fishes AND inverts** in the same aquarium. This can be a big mistake.

In the early days of a new seawater aquarium, especially in the hands of a novice, the water quality will fluctuate alarmingly. We have already learned that marine fishes cannot take such fluctuations, so fishes subjected to abrupt changes will probably become stricken with any number of diseases which will need to be

treated. This treatment is the nub of the problem when trying to keep a mixed fish/invert aquarium.

The majority of really effective treatment against most pathogens involves the use of copper. Unfortunately, copper is lethal to invertebrates. In fact, it is only marginally less toxic to fishes than it is to the pathogens! It doesn't take an Einstein to work out the problems that this can cause. For this reason, I strongly urge you to forget about keeping fishes and invertebrates together — for the time being at least.

In fact, I would recommend that beginners forget about most inverts altogether. Numerous species are fragile in the extreme (with some notable exceptions e.g. among the shrimps, crabs, etc) and need specialist care. I will speak of them at a later date, but the message is: until you can keep fishes successfully, you'd be well advised to stick to a fish-only aquarium, or gain some experience with some of the tougher inverts.

## pH control

There is a lot of nonsense talked about pH. That mystical water quality factor is either the scapegoat of every conceivable ill which besets the marine aquarium, or else is ignored altogether.

The measure of alkalinity (pH) of seawater in the tropics ranges from 8.1 to 8.3. While no-one knows the effects of long-term exposure to values lower than this on coral animals, it makes sense to keep the pH of the aquarium to within this range.

I have spoken before — many times — of stress and its effect on the wellbeing of aquarium inhabi-

tants, and one thing is for sure: to expose aquarium animals to anything which they do not encounter in the wild is stupid.

As the pH drops towards 7.0, the amount of carbon dioxide which seawater can hold increases considerably. This high concentration of carbon dioxide interferes with the respiratory efficiency of fishes, which, in itself, can cause severe stress.

Aquarists commonly believe that substrates like coral gravel or crushed oyster shell are capable of providing enough buffering capacity to keep pH at the correct levels. Rubbish! These materials do not dissolve in water with pH values above 8.0, so that when they do start to work, the aquarium is already in trouble. The best you can hope for is that they will buffer the water at around pH 7.6 to 7.8 and these values are 50 to 60 times more acidic than those encountered on the reef.

Substrates like these will protect against sudden changes in pH, but over time, acidic waste products will accumulate so badly that the pH of an aquarium will go inexorably down, causing umold damage. Both protein-skimming and filtering over carbon will slow the process down by removing acidic waste from the system before it can react with its natural buffering system.

The main benefit of carbon is its adsorption of weak acidic compounds, but although the use of it and a protein skimmer will delay the fall of pH, they cannot hold it indefinitely. Sooner or later, the aquarist — you and me — has to do something about it. pH buffers can only be considered temporary measures. Regularly changing water is the only way.

## Rising problems

The sea around Trinidad and Tobago is rising. Dr Bhawan Singh, leader of an Earthwatch expedition to study the phenomenon, talked and listened to locals about what was happening and estimated that the sea had extended about 800 metres inland and had covered at least one square kilometre in just 60 years. Singh believes that the rising sea is all down to global warming. With half of humanity living within 60 kilometres of the coast, the effects of warming could be catastrophic.



Is the sea rising... or is the land sinking in Trinidad and Tobago?

Trinidad — along with other Caribbean nations — depends a great deal on tourism. Rising seas could wreck this, and, if (as we've reported on other occasions) coral bleaching continues and the reefs are weakened, fishing around the area would be seriously damaged, as fish move away.

Rising seas could also harm agriculture. Coastal cocoa plantations would be at risk and if seawater were to enter the aquifers, not only drinking water, but also irrigated crops, as well as the fields themselves, would be ruined.

However, although there can be no doubt that the sea is swallowing the land, no one can be sure whether it is the sea that is rising or the land that is falling. After all, Trinidad was once part of Venezuela and, like her, is rich in oil resources. By removing these resources, the locals could be causing the land to subside.

In any event, ways have to be found to deal with the problem of flooding on a grand scale and Earthwatch have joined forces with UNESCO (United Nations Education, Scientific and Cultural Organisation) to find them. I shall be watching the situation and will let you know anything that I pick up. As they say, wait this space! Meanwhile, I'll be with you next month.



Invertebrates (these are Florida False Corals) are generally very sensitive to poor environmental conditions



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# FISHY HOTELS

Aquarian's Dr David Ford reports on two spectacular aquatic arrangements created by hotel owners who fancy something a little larger than a community tank!

*Photographs by the author*

Many hotels have an aquarium in their foyer or in their dining room as a decoration (unlike restaurants who house their diners' meals). Often, the owner of such a hotel is an aquarist and is able to indulge his/her hobby. In some cases, though, the aquarium is rented from the local aquarium shop, who maintain it under contract. Mostly, these tanks are normal 3- or 4-footers with Goldfish or, perhaps, tropicals. But not always...

The largest hotel tanks in Europe are in the **Coppid Beech Hotel** at Coppid Beech roundabout (A329), Bracknell in Berkshire. The hotel — which was featured in *A & P* — was only built three years ago (and won an award last year as the best hotel in the UK for disabled guests). The owner likes alpine flowers and had species designs woven into the corridor carpets. Since three corridors meet on each floor at a central point, three types and colours of flowers were chosen... yellow, blue and red.

To complement these colours, aquaria were built at the ends of the corridors, housing yellow, blue and red fishes. It was decided that coral fishes would require too much maintenance, while ordinary tropicals might not be hardy enough, so the obvious choice was cichlids, two dozen in each, with a few catfish to clean the base.

The tanks stretch from nearly the floor to the ceiling in each corridor, making the fronts 5ft high, but are only 14in wide (150 x 35cm). With three floors, this gives nine giant tanks, angled in such a way that they can be viewed from the lobby by looking up the three levels.

The matching colour fishes are as follows: at the end of the corridor with red flowers are Jewel Cichlids and Red Rainbowfishes, because both species are red-

coloured. At the end of the blue flower carpeted area are the Malawi Blue Cichlids, Electric Blue Haplochromis, Malawi Blue Dolphin, *Aulonocara hansbaenschi* (this fish is a morph without the Red Flash), *Protomelas annectens* and *Gephyrochromis acel*.

For the yellow flower section are Malawi and Victoria Cichlids, such as New Yellow Regal Peacocks, *Pseudotropheus* sp. 'Daktari', Yellow Labidochromis, Orange Chest *Pseudotropheus*, plus some South African Mouthbrooders. The Catfishes are assorted African and American *Synodontis* and *Plecs*.

**Quality** of London maintain the tanks for the hotel, with auto-feeders and individual power filters hidden in cupboards at the side of each aquarium. The lighting is automatic too, and passes through dawn, bright, dusk and moonlight stages.

The largest hotel aquarium in America is actually in Hawaii (which is still part of the USA, as the 50th state... but the locals are trying to change that!). The **Pacific Beach Hotel** is on Waikiki Beach, near Honolulu, on the big island of Oahu. Like the Coppid Beech, it is on three floors, but there is just one giant concrete aquarium, with 8 x 20ft (2.4 x 6m) windows for viewing!

The aquarium is full of sea-water and houses many species of coral fishes, as well as Giant Rays and Sand Sharks. Each hotel floor has its own restaurant, where you can dine in front of the giant acrylic windows, watching the fish swim by, way over your head. The top floor restaurant is, however, at water surface level, so you can look down on the fish instead.

One thing I have noticed about 'hotel fish' is that they all look stress-free and very colourful and swim lazily around, but they do seem rather fat. Must be their contented lives!



## FROM TOP TO BOTTOM —

**View of the Coppid Beech Hotel tanks looking up three stories from the lobby floor.**

**The filter system and other services controlling the Coppid Beech Hotel tanks are housed in a cupboard at the end of each individual aquarium.**

**The second floor dining room at the Pacific Beach Hotel has panoramic views of the giant aquarium.**

**The top of the Pacific Beach Hotel's aquarium is on the fourth floor, complete with a 'sea-waterfall'!**



## OBITUARY

**STAFFORD** William Somerfield, former chairman of Dog World Ltd, publishers of *Aquarist & Pondkeeper*, and the man largely responsible for that company's purchase of *A & P*, has died just a few days after his 84th birthday.

He began what was to become a long, successful and, at times, controversial career in journalism when he joined the Barnstaple office of the Devon evening paper, *Express and Echo*, moving after a five-year apprenticeship to its head office in Exeter.

He followed the familiar path of journalists, both before and after him, by moving to another provincial paper of substance, the *Bristol Evening Post*, before joining *The Daily Telegraph* in London before the second world war.

He spent a short period with the now defunct *News Chronicle* before volunteering for military service, first with a company of journalists and actors in the 2nd Battalion, The Queen's Westminsters, and later, with the Gloucestershire Regt, ending his service with the rank of major.

Then it was back to Fleet Street, but, denied his former place on the *News Chronicle*, he joined the *News of the World*, serving in various capacities during his 25 years with the paper before becoming its editor. His ten-year tenure of this position ended in three minutes when fired by its then new owner, Rupert Murdoch.

There had always been dogs in his life and, following his dismissal from Fleet Street, he turned more towards this interest.

Eventually he joined *Dog World*, became a director and chairman of the board. Around this time the paper acquired other interests, among them *Pet Business World*, a monthly magazine dealing with the pet trade, *Aquarist & Pondkeeper* and the British Pet Industry Exhibition which today is organised as Petindex and the Pet Trade and Industry Association.

His weekly column in *Dog World* was one of the focal points for readers.

For nearly 40 years he was a member of the Kennel Club and for a period a member of its rule-making General Committee, but his outspoken and forthright attitudes often brought him into conflict with those in authority.

He retired from active participation in the company's affairs on his 80th birthday, being succeeded as chairman of Dog World Ltd by his wife, Ferelith, who continues to take a keen interest in the production of *A & P*.

Stafford Somerfield was brought up a Methodist in a West Country family where Liberal sympathies were strong. He liked to call himself a democrat and would question all things which he felt deserved questioning. It was this approach to life which caught the imagination of the ordinary man and woman and led him to challenge attempts to overrule their interests.

He was married three times and besides his wife, Ferelith, is survived by two daughters from his first marriage. His funeral was at Charing Crematorium, Kent, on January 23.



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## FASCINATING FISH FACTS

### Fish with a 'pecking order'

Aquarists tend to keep Swordtails in groups of three (two females and one male), or as a pair. In the wild, these livebearers live in larger, mixed groups, and males have to compete among themselves for the females.

To avoid constant squabbles, the fish sort out a pecking order via a series of courtships and fights. First, two males will flex their bodies into an S-shape and spread their fins. If the fish are of similar size, they go on to circle each other, attempting to bite each other and sometimes engaging in mouth-to-mouth wrestling. Eventually, one male in the group emerges as the strongest, and he wins the right to court any ripe females. Occasionally actual physical injury can occur — although damaged fins will regrow.

Once a hierarchy has been established, things settle down and squabbles become rare, until a young male grows big enough to challenge the 'top fish'. Then, the process begins over again. *David Lewis*





DAVID TWIGG'S

# KOI CALENDAR

## Jobs for the month

The weather is not a lot better and the wind will no doubt be blowing, but the days are getting longer, even if nights are still very cold. Water temperature, while still being low, should be starting to rise.

We are therefore approaching the time of year when your Ultra Violet steriliser should be working at its optimum to help fight the increasing activity from, and rising levels of, harmful parasites, bacteria and, of course, that other perennial problem, algal bloom.

Perhaps, on one of the brighter days, time could be found for a thorough cleansing of the quartz tube through which the UV light penetrates, thus improving the 'kill' rate. However, this is no substitute for tube replacement if it has been in long service. A change after 6 or 12 months' use (according to lamp type) is the accepted norm in Koi circles.

While the unit is stripped down, it would be wise to check the condition of the 'O' sealing rings. If perished or damaged, which could allow water under pump pressure to get past, then replace with new items; water and electricity don't mix well. Also, please don't forget to observe the safety rules when carrying out this task. Disconnect from supply before dismantling and don't look at the bright UV light (harmful to the eyes) when reassembled and under test.

Many of the Koi clubs around the country, are paying visits to specialist dealers at this time of year. Any fish brought into the UK in November or December should be well settled by now. However, if considering the purchase of a new pet, do ask the dealer how long the fish has been in stock, because many dealers take delivery of new stock on a weekly basis over many weeks of the year.

## Magnetic debate

In recent months, there has been a lot of discussion among Koi keepers about ways of preventing the growth of blanket weed in our ponds. This has



ranged from in-depth articles to deep discussion over a pint in the pub following a club meeting. Many facts and theories have emerged from these discussions which show just how knowledgeable and ingenious the Koi fraternity can be when faced with such a problem.

Ultra violet waves (at the germicidal wavelength) have been used for some years now to combat the problem of algal bloom, commonly known in the hobby as 'green water', but these do not help with the eradication of the many types of filamentous algae that can literally grow from one side of a 10ft pond to the other in a day. I know, I am that man!

It has been said in the past that if the build-up of scale on the surface of the pond could be reduced, then the blanket weed would have nothing to cling to and would therefore not grow. So

the magnetic devices, used in the domestic water industry for many years to remove or prevent the build-up of limescale in pipes, were tried for efficacy on this problem. In some instances, they appeared to work; in others, they most definitely didn't.

Some Koi dealers felt, however, that this line of thought was worth pursuing and purpose-built 'magnets' were manufactured and sold to the hobby; these seemed to get bigger and more powerful each time a new version was developed. Once again, these units worked for some and not others.

More recently, the scientific approach has been taken, which looks at the structure of water molecules and suggests that these can be considered to be small magnets which normally line themselves up with the

### WHAT'S ON IN MARCH

1 — Border Koi Club. Meet in Carlisle. Contact Mrs Amy Fisher, 01226 513623.

— Leicestershire Koi Society. Monthly meeting, B.S.C. Social Club, Scudmor Road, Leicester. Contact Pip Osell, 01533 609707 or Kevin Luckman, 01455 250413.

— Yorkshire Section BKKS. Monthly meeting. Contact Phil Swallow, 01422 343674.

2 — Suffolk & North Essex Section BKKS. A.G.M. Stanney House Football Club. Contact Alan Carter, 01206 896011.

3 — Merseyside Section BKKS.

Coach trip to Shirley Aquatics. Contact Robbie, 0151 549 2001.

6 — EastEnd Section BKKS. Meeting, 7 pm, Wellstead Community Centre, Vicarage Lane, East Ham, London. Contact Phil Davis, 01275 443754.

8 — South Hants Section BKKS. Meet at 8 pm in Donhead Church Hall. Guest speaker is Adrian Exall of Interpet talking about Koi Nutrition. Contact George Rooney, 01420 473169.

10 — Heart of England Koi Society. Meet in Warwick. Paul Jerratt speaks on Pond Construction.

Contact me, 01926 495213.

12 — Mid-Somerset Section BKKS. Frank Prince-Jones talks on Water Quality and Koi Health, 2 pm, West Monkton Village Hall. Contact Alan Punnett, 01456 272152.

13 — Merseyside Section BKKS. Speaker is Geoff Lambert. Meeting at Knowsley Village Hall. Contact Robbie, 0151 549 2001.

14 — Nottingham & District Section BKKS. Monthly meeting. The Western Club, Nottingham, 8 pm. Contact Shirley Hind, 0115 981 0923.

— Lee Valley & Harlow Section

BKKS. Speaker is Paul Stacey of Shirley Aquatics. Contact Mick Fehy, 01181 508 5135 or Alan Barnall, 01279 814636.

19 — Northern Koi Club. Monthly meeting in Manchester. Speaker is Bob Langrish of Greeniside Landscapes. Contact Tony McCann, 0161 794 1556.

22 — London Section BKKS. Speaker is Nicki Chapple (Koi Water Bars), Ruskin House, Croydon. Contact Keith Nind, 0181 673 3574.

28 — BKKS National, A.G.M. at the Moul House Hotel, Northampton.





S. WANG PHOTO

earth's magnetic field. While aligned in this way, the filamentous algae will be able to grow along this line. If, on the other hand, this alignment could be broken, then so would be the ability of the blanket weed to grow.

Out of all the discussions came the fact that some people who had fitted magnets to their system and enjoyed early success, found that after a few months, the blanket weed had started to take hold again. The theory being proposed here was that the magnet used had been polarised in a way that disrupted the molecular alignment, thus preventing the growth of blanket weed, but over the period of time caused the water molecules to take up the alignment of the magnet, thus allowing the filamentous action to recommence.

The next conclusion was to reverse the polarity of the magnets at this time, so as to start the procedure of misalignment all over again until alignment reoccurred in the opposite direction, and so on. I read that this idea was tried and found to be successful and it would explain why some magnets fitted to ponds did not work.

I and many others who suffer from this problem look forward to the end of blanket weed and hope that this is the solution... but ???

**Are you geared up to fight the blanket weed problem this season? If you are, what method do you intend to employ? Write and tell us.**

## SHOW CALENDAR

Now to some of the coming season's shows, details of which are starting to come in. I look forward to meeting readers at some of these events, hopefully, more this year than last.

### APRIL

29/30 — International Koi Show, Telford Exhibition Centre.

### MAY

6/7 — Belgian Open Koi Show, Huyzingen (20km from Brussels).

28/29 — Merseyside Section Open Show, South Hants Section BKKS Open Show. Contact George Rooney, 01420 473169.

29 — Avon Section BKKS Closed Show, Part of The North Somerset Show, Ashton Court, Bristol. Contact Dave Knowles, 01454 774676.

### JUNE

3/4 — Yorkshire Section BKKS Open Show, Contact Phil Swallow, 01422 343674.

18 — Crouch Valley Open Show, Contact Ron Parfitt, 01277 40853.

25 — Suffolk & North Essex Section Closed Show, Langham Community Centre, Contact Alan Carter, 01206 866011.

### JULY

23 — Essex Section BKKS Open Show, Aveley Sports Ground.

### AUGUST

12/13 — BKKS Koi '95, Billing Aquadrome, Northampton.

19/20 — Lea Valley & Harlow Section BKKS, Closed Show at Harlow Garden Centre, Contact Mick Fahey, 0181 508 5155 or Alan Burnall, 01279 814638.

### SEPTEMBER

24 — Northern Koi Club Show, Cascade Water Gardens, Contact Tony McCann, 0161 794 1958.

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# WRITEBACK

## Sentinels and assertive males

I found the December issue of *A & P* very interesting, particularly the bit about 'sentinel' *Discus* in the Rio Negro (*Discus: What's in a Name?* by Anton Caas). I really couldn't have imagined *Discus* having such a social structure. There are still so many secrets to discover!

I also found the editorial, **Know-it-all-itis at large**, very observant. We, too, have this type of person in France. And yes... they are often male! Maybe, this is a way in which males can assert themselves, since, nowadays, this is more difficult to do within one's job... or even within the family environment.

Marie-Paule Piednoir,  
St Julien-de-Crampes,  
France.

## Greek know-it-all

Regarding your editorial **Know-it-all-itis at large**, the fact is that, yes, there are such people about, too many of them, and they are mostly male, although I have also come across one woman, too. **Know-it-all-itis** is, obviously, wrong. Too wrong.

Some eight years ago, I had to cut back on many things, one of which was fish magazines. I bought a book from time to time, but I can tell you, I was left behind. Way behind.

I read things about new fishes from time to time, but almost nothing on new ideas, new treatments, new filters or critical reviews for all these... and more.

I'm 52 years old and have kept fish for 35 years now, counting my first Goldfish in his bowl. At the moment, I have seven tanks, mostly built by myself, but there was a time when I had twelve, one of them saltwater.

I've collected my own stock for some of my aquaria: plants, frogs, newts, worms, shrimps... all native. Presently, I'm a subscriber to *Aquarist & Pondkeeper*, plus an American magazine.

I learn all the time... and am really happy I do!

Rena Pantazopoulos,  
Halandri,  
Athens,  
Greece.

## BIOPLAST LETTER OF THE MONTH

### Experience v Money

I fully sympathise with Mr J Lumley (*Write Back*, November '94). As an older fishkeeper, I showed tropicals successfully at numerous events for many years. I recall the genuine enthusiasm of seeing a nice group of breeders' teams, both as Growlights or Pearl Gouramis, knowing that the breeder had only paid a few shillings (old currency) for the parents, had nurtured them into breeding condition and had subsequently raised the young with very little technology to help.

For many, these were the best years of fishkeeping — days of discovery by the modest fishkeeper, and of shared information.

Today, at the few shows I am able to attend, the conversation is geared towards costs: the price of an expensive catfish or stingray, or a rare cichlid. These fish now get more attention than the modest well kept tetra, while coldwater fish are largely ignored, that is, if any have been entered in the show in the first place.

The truth is that most recent fishkeepers know the value of money, but haven't got a clue about the value of experience and work put into establishing breeding stock and eventually producing show standard Goldfish. They don't want to learn about anything — they just replace dead fish.



Quality Goldfish (this is a Pearlscale): the clue to Jeff Lumley's dilemma.

I know that if shopkeepers stock quality Goldfish, they can't sell them in preference to cheaper, inferior fish, and that's the clue to Mr Lumley's dilemma.

There are exceptions, of course, and I know several excellent aquarists in the Province (even a few younger ones) and we compare notes all the time. I also take comfort by belonging to the Goldfish Society of Great Britain. Although I've never been to a meeting, I feel part of a special band of friends.

We may never get back to the days when experience and work produced the best of the tropicals, but I don't really care, and neither should Mr Lumley. Both he and I know what we have in our own fish-houses, and if no one else sees or appreciates our fish, that's their loss, not ours.

Ken Denham,  
Belfast,  
Northern Ireland.

Thank you, Ken, for your heartfelt comments. A parcel of BioPlast products worth £30 will shortly be winging its way to you from our sponsor BioPlast (UK).  
Tel: 01535 630230.

## Making matters AllClear

On page 58, paragraph 2, of Barry Goodwin's article **Filtered Facts** (*A & P*, Jan '95), he says:

"One point to watch, however, is that the purifiers at the top end of the range are thought to take out some of the essential minerals we actually require. It is recommended therefore that mineral replenishment be carried out by employing 'refresh' or 'montmorillonite'."

We, and the users of our purifiers, see AllClear Water Purifiers at the top end of the range. To aid scientific accuracy and to ensure that AllClear's reputation is not damaged, it is important to state that there is no evidence to indicate that our purification systems reduce 'essential minerals'; in fact, we do have indications to the contrary. I am sure that you will understand my request that an entry is printed in *Aquarist & Pondkeeper* to show that our purifiers are not included in Barry Goodwin's conjectural statement.

As part of whole fish health management, however, we do recommend to fishkeepers that fish are fed a mix of good-quality foods to ensure that they are given a well-balanced diet and that vitamin and mineral supplements are added at recommended dosages to the pond. As an ex-nutritionalist, I am aware of the important part essential vitamins and minerals play in maintaining good health, whether we are discussing people, fish or other livestock — not to mention the problems that excess quantities of vitamins A and D can cause. I am also aware that when people only infrequently change very small amounts of water in the pond, the total available minerals in the pondwater will be eventually exhausted.

Ann Telford,  
AllClear Water Purifiers,  
Brentwood,  
Essex.

## Deadly brew... continued

I would like to respond to Mr Waite, one of the eight Principal Inspectors of the Drinking Water Inspectorate, whose letter with regard to Barry Goodwin's article **Koi Health: Deadly Brew** appeared in your February issue.

Mr Waite writes: "Water supplies are not specifically required



# WRITEBACK

to be suitable for fishkeeping... showing he grasps the nub of the problem. It has been shown on too many occasions that deliberately to expose aquatic life-forms to UK tapwater is, in many cases, as reckless as taking a group of beach-lovers clad only in sneakers and shorts up Snowdon in a January blizzard!

He goes on to make various points which may be totally valid where drinking water standards are concerned, but is perhaps cavalier in his dismissal of the results of the abandonment of pumping at redundant British Coal pits. Which Minister of State would he like to volunteer to support his claim that contamination of drinking water supplies would not be permitted to occur? How does he envisage the achievement of this dream? I have seen too much contrary evidence to be so easily convinced, and so have many fishkeepers.

Mr Waite is, for instance, lucky that he will not have to explain the reasons for flooded foundations of low-lying buildings as water tables return to pre-mining levels and old watercourses flow again, but now with high contaminant content, discharging directly into existing rivers and reservoirs.

He further dismisses deposits of manganese, iron, lead and aluminium as "harmless".

I would be the last to suggest that the Water Utilities are not doing their best, but the report from which Mr Waite quotes was up to 12 months out of date upon its publication in July 1994, and a lot of water has flowed since then.

Somehow, Mr Waite's "feel good" factor escapes me.

Charles Harris,  
Purity on Tap Ltd,  
Newbury.

## An 'i' too many

In the article on growing Java Fern (December '94), written by Steve Dent, you included a footnote in which you asked for information regarding the spelling of the generic name: is it *Microsorium* or *Microsorium*?

The correct spelling, according to the International Code of Botanical Nomenclature is *Microsorium*, i.e. without the second 'i'. *Microsorium* (with the 'i') appeared later so, according to the rules, the earlier version applies.

Useful references:  
1. Boemann M T M (1990) Ori-

ginal *Microsorium* v later *Microsorium* (Polypodiaceae). Taxon 35: 590-591 (Rijksherbarium/Hortus Botanicus, Leiden, Holland).

2. There was also an article (written in German) by Christal Kasselmann published in DATZ (March-3-1994) pages 188-189. This article also features new varieties of *Microsorium* which were exhibited on the Tropical Stand at Interzoo, Nürnberg in May last year.

All Statsberg,  
Tjodelyng,  
Norway.



Java Fern: *Microsorium* not *Microsorium*

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March brings a veritable explosion of life moving on to the shore from the deeper (although still relatively shallow) water. The reasons for this seasonal migration from the shallow seas offshore are complex; they include tidal variations, higher temperature on the shore and increased food supply.

## Tides

The Vernal Equinox<sup>1</sup> occurs on 21 March 1995 and it is around this time that the greatest variations of tides occur. This is the time the 'spring' tide rises furthest up the shore and also recedes the most, uncovering rock pools that are only accessible to the terrestrial explorer a few times a year.

Experienced rockpoolers will know that it is the pools near the low water mark that provide the richest hauls in the variety and number of species. Tide tables, available in newspapers and ships' chandlers, should be consulted to find the exact time of low water.

'Spring' tides do not refer to the seasons but to the illusion of the tides springing up the shore. The opposite is 'neap' tides; the smallest tide variations also occur around the time of equinoxes.

## Rock turning

Dipping a prawn net into the pools is not the only method employed by rockpoolers to explore the shore; rock turning tends to be more productive.

Rocks resting in shallow depressions in pools prove to be the most interesting. Small fish like the Butterfish and the 5-Bearded Rockling, will hide under the rocks as the tide goes out. Sedentary animals that only move slowly or occasionally, like the Beadlet Anemone and the Shore Urchin, may be attached to the underside of rocks. Small crabs will quickly scamper sideways to safety.

Often overlooked, at first, is the interesting life that is actually attached to the underside of the rock itself. Limy tubes may house the Keelworm which, if placed in a tank, will reveal attractive feeding tentacles in red and blue, which need to be examined under magnifying equipment.

Other colonial animals could easily be mistaken by the inexperienced rockpooler for plants. One of these is the colonial sea-squid called the Star Ascidian, which appears as stercid-like zooids on a flat jelly-like layer.

All rocks should be replaced the same way up in the same position as they were found, as these life forms will perish if they

# SHORE WATCH

BY ANDY HORTON

Photographs by the author

Andy Horton will be pleased to answer enquiries from readers if a SAE is enclosed. Please write to:

Andy Horton  
British Marine Life Study Society,  
c/o Aquarist & Pond-keeper, 9 Tufton Street,  
Ashford, Kent  
TN23 1QN.

are exposed to the sun, or become desiccated out of the brine.

PLEASE FOLLOW THE COASTAL CODE

## Butterfish

Elongate just like a snake, and as slippery as an eel, hence its name, the Butterfish is a fish spe-

cially adapted to spending part of its life on the shore. It can be scooped up in an aquarium net, as it will tend to slip out of fingers.

This orange-brown fish is distinguished by the presence of between 9 and 15 false eye-spots underneath the dorsal (back) fin that runs the length of its body. It possesses a small mouth, and young specimens up to 9cm (3.5in) will feed on small crustaceans. Adults will include worms in their diet and reach a length of 25cm (10in).

This fish is much commoner in the north, where it is extensively preyed on by seabirds and eaten by otters. It occurs the length of the British coast, but reports from rockpoolers in the south and west seem to indicate it is not so common on the most southerly shores.

Aquarists should note that it is intolerant of temperatures in excess of 19°C (66°F) for more than a day or two. It is rarely found in pools and can live in a shallow depression with very little water for an hour or two while the tide is out.

**CENTRE**—Limy tubes of the Keelworm on the underside of a rock

**BOTTOM**—Grey Sea Slug feeding on a *Sagartia* Anemone.



## Grey Sea Slug

The Grey Sea Slug is one of the largest (it reaches 12cm — 4.7in — although most specimens are smaller) of the nudibranchs found in British seas. During March it will crawl on to the shore to lay its white spirals of spawn on the underside of rocks. Dead bodies of this sea slug will litter the shore in some years; they die immediately after spawning.

Occurrence on the shore varies from year to year. This may be in response to variations in the numbers of sea anemones on which the Grey Sea Slug is the major predator. About 12 species of sea anemones are found intertidally around Britain (the variety is greater in the south and west). The Grey Sea Slug will eat all the species by attacking the base or the bottom of the column. It will attack the anemone's tentacles if given the opportunity, but these will retract when under attack.

In Sussex, the shore can be carpeted by a sea anemone called *Sagartia troglodytes* which is highly variable in colour and spans 50mm (c 2in) across its tentacles. It usually begins to venture in from deeper water in March and the numbers of Grey Sea Slug seem to correspond to the numbers of the sea anemone.

## Note:

<sup>1</sup>The Equinox is the point at which the sun crosses the equator and day and night are of equal length all over the world.



## MARCH CHECKLIST

All the permanent fauna listed in January, and numerous worms and several species of acorn barnacles, will still be prevalent on the shore. During March, the second wave of mobile fauna will arrive from deeper water. Decades of experience have shown that the following species of interest to aquarists are the most likely to be discovered between the tides:

### Bony Fish (Teleosts)

Viviparous Bienny	<i>Zoarcetes viviparus</i> (east coast only)
Bienny	<i>Lipophrys pholis</i>
Rock Goby	<i>Gobius paganelus</i> (south and west only)
Bubblefish	<i>Pfotele gunnellus</i>
5-Bearded Hoeling	<i>Ciliata mustela</i>
Bullhead (Sea Scorpion)	<i>Taurulus bubalis</i>
Common Goby	<i>Pomatoschistus microps</i>
Small-headed Clingfish	<i>Apletion microcephalus</i>

### Crustaceans

Porcelain Crab	<i>Porcellana platycheila</i>
Shore Crab	<i>Carcinus maenas</i>
Hairy Crab	<i>Pilumnus hirtellus</i>
Ebble Crab	<i>Cancer pagurus</i>
Prawns	<i>Palaeomonas</i> sp.
Brown Shrimp	<i>Crangon crangon</i>

**Brood-clawed Porcelain Crabs** cling tightly to the underside of rocks and boulders.



### Echinoderms

Common Starfish	<i>Asterias rubens</i>
Shore Urchin	<i>Psammechinus miliaris</i>

### Sea Slugs (Opisthobranch Molluscs)

A nudibranch	<i>Ochidaria blattellata</i>
A nudibranch	<i>Acanthodoris pilosa</i>
Grey Sea Slug	<i>Aeolidia papillosa</i>

### Sea Anemones

Snakelocks Anemone	<i>Anemonia viridis</i> (= <i>A. sulcata</i> ) (south and west only)
Dahlia Anemone	<i>Urticina felina</i> (= <i>Fessia</i> )
Plus regular species (see January's Shore Watch)	

### Other animals

Keelworm	<i>Pomatoecoma bigueta</i>
Star Ascidian (Sea Squirt)	<i>Bolyris schlosseri</i>

**Note:** The principal monthly records are taken from the English Channel with additional reports from BMLSS members around the country. They are a general guideline. Experienced rockpools know that almost any species can turn up in any month. I would be pleased to receive reports of other rockpool and shore inhabitants.

MARCH	BRITISH SEA TEMPERATURES (SURFACE, INSHORE)	
	°C	°F
	6.7	44
	5.6	42
	7.8	46
	6.7	44
	7.8	46
	14.4	58

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AQUARIST AND PONDKEEPER / MARCH 1985 / 19



# KOI TALK



by  
Alan  
Rogers

Photographs by the  
author

Physical restraint of any fish without the aid of some form of sedation is always going to be an extremely hazardous operation. Attempting to hold down a Koi while you wrestle with it in one hand and chance treatment to an open lesion with the other, can best be described as objectionable and primitive.

The sole purpose of anaesthetising a Koi is to render the fish insensitive to pain, and totally to relax muscle and body movements while applying medical treatment or surgery wherever it is considered necessary. Having discovered that a number of Koi keepers were unfamiliar with the principles of using anaesthetics, last month's *Koi Talk* dealt solely with the aspects and principles of sedating Koi for treatment.

## Preparations

It is very easy to damage Koi, particularly larger specimens. If a soft treatment bed is not prepared prior to applying medications. The natural buoyancy of Koi in water protects and cushions vital internal organs, such as the swim bladder, the intestinal tract and the reproductive organs from damage. It is important that

critical pressures of the Koi's own body weight are not subjected in unnatural positions onto these organs when laid down on a hard flat surface.

The same consideration to protect these internal organs should be considered when lifting and handling such Koi, always giving adequate hand support to that vital abdominal region.

I use a one-inch thick foam rubber cushion about 30 x 16in placed inside a plastic bag to keep it dry and protected. A very damp towel or soft sheet as large, if not larger, is placed on top of the foam mat, giving the patient supported protection from a hard table, while the damp towel will give the benefit of covering the Koi as necessary.

This practice of utilising a damp cloth will prevent the mucilage cells on the epidermis layer (skin) and protective mucus coating from drying out. Having observed a number of operations carried out in full sunlight, I can tell you that this mucus layer dries somewhat swiftly!

Once initial examination of the patient has been carried out, it will only be necessary to expose those areas which are intended for treatment. If unfavourably warm conditions or extended treatment times on the foam mat are unavoidable, then occasional wetting down with pondwater will be beneficial in preserving this essential mucus layer.

## The medicine chest

There are numerous variations of choice for the contents of our 'Be Prepared' medicine chest, but for the purpose of this exercise, we shall consider only a selection of topical remedies to treat accidental damage, open lesions, swellings and areas displaying inflammation.

Cotton buds or small artist-style paint brushes are the preferred choice in applying most medications. At this point, it should be stipulated that it is neither good practice nor recommended to use bare fingers.

A surgical kit consisting of various stainless steel tweezers, sharp scissors and scalpels should always be to hand. A large roll of absorbent paper kitchen towel is important for cleaning areas surrounding the wound. All loose scales and other fibrous material from the dermis and epidermis layers should be cleaned or removed before applying treatments.

Be very aware of the formation of new skin developing on older wounds; this can usually be identified by a thin layer of an almost translucent membrane forming over the dermis (sub-skin layer).

The paper towel can also be

used to protect delicate areas, such as the eyes and gills, from any medication residual whenever treatments are close to these parts of a Koi's body.

## Objectives & effects

The effect of therapeutic chemicals as topical treatments is based upon their being more toxic to the bacteria or parasites than to the host. Obviously, the greater the difference in toxicity, the safer the medication. In addition to external treatments, the Koi's tolerance, and success rate with such medications, once returned to the pond, is always dependent upon the quality and temperature of the water.

The object of treating an open lesion is to sterilise affected areas by the use of an antiseptic. This, in turn, will assist 'rehabilitation' of the dermis layer, ultimately sealing it off from further bacteria or parasitic infection as quickly as possible. The outside layer of skin or epidermis, will then be able to function by secreting further protective mucus to the surface of the body.

The cleaning of a wound could initially be carried out with a number of medications, but controversy in recent years over certain treatments has led to a number of heated debates, causing great confusion. The type of treatment I select for my Koi is based upon many years of successful and practical results.

Whenever the need arises for one of my Koi to require treatment, my sole objective is to achieve a successful cure, returning that Koi back to a normal healthy existence as quickly as possible. This, to me, is simply commonsense and, certainly, the last thing which is needed in any medicinal choice is an element of confusion.

I am privileged to have direct access to information from the US Food and Drug Administration and the US Department of Wildlife and Fisheries who have enormous experience and resources, documented records and approved treatments for all freshwater fish. Their professional reports often refer to favourable treatments, which 'experts' here in the UK consider sometimes taboo, basing their advice on unsubstantiated information or hearsay, thus creating further confusion to the newer Koi keepers.

## Medications

Tincture of Iodine and Roccal antiseptic can be used directly without dilution and are easily obtainable from your local pharmacist.

Malachite Green purchased in



A suitable surgical kit.



Topical treatment of a lesion with a cotton bud.



After treatment, the wound is sealed with Orabase.



Encouraging signs of a new dermis layer developing on a successfully treated lesion.



crystal form can be used at the rate of 1 gram into 100ml of water and effectively used directly onto the wound. At this dosage, Malachite Green can only be used as a topical treatment and should be made from zinc-free crystals. This strength of stock solution can be kept for future use, provided it is kept out of daylight and in a dark glass bottle to prevent rapid deterioration.

**Potassium Permanganate** is usually better known as a pond treatment, but, similar to Malachite Green, it can be made at the same dosage, i.e. 1 gram to 100ml and directly applied to a lesion with successful results.

**Acriflavine**, although not so easily obtained nowadays, is also useful as a topical application.

**Proflavine Hemisulphate** is almost identical in every aspect to Acriflavine and should be considered as a valuable resident inside the medicine chest.

Both are orange-brown powders in their natural state and will need mixing with water to produce a small quantity of liquid solution. Once prepared, it can easily be applied with a cotton bud to the desired area; the remainder may be kept for future use for a limited period.

**Mercurochrome** is an old and tried and tested remedy for open cuts and wounds and has long been used as a sterilising agent. In its natural state, it is a fine powder, but was usually supplied as a 2% solution. This treatment has been one of those subjects under hot dispute in the past, but nonetheless, is still used today by UK and Japanese hobbyists, as well as by many experienced breeders. Tincture of Iodine or Acriflavine are unquestionably safer products to use, the latter also being an effective protozoicide (anti-protozoa treatment).

## Waterproof seals

Most of these topical treatments are liquids, so, obviously, as soon as the sedated Koi is returned to the pond, dilution will take place to the area, rendering the fish exposed, once again, to the possibility of further bacterial attack. If, however, we are able to seal that lesion effectively with a waterproof antiseptic cream or paste, then, certainly, the odds are improved for extended protection, and the initial medication will therefore be sealed in longer.

Once the Koi's own natural antibodies start to take over, provided the water quality and temperature factors are favourable, a natural healing process should begin to take effect. As a general rule, any follow-up treatments can usually be carried out from approximately three days onwards.

**Orabase, Siopel or Friar's Balsam** have all served as waterproof barrier pastes and are readily available from your chemist. I have used, with excellent results, a lesser known **Proflavine Hemisulphate** cream, which is a thick antiseptic barrier cream and is often prescribed from a veterinary practice on damaged hoofs and legs on cattle or sheep.

I have found **Polybase** antiseptic cream, which is of Japanese origin, less effective in its abilities to 'cling' to the subject for the same duration as the above alternatives, and somewhat more expensive.

## Cautionary note

Most of these liquid treatments will stain profusely, so spillage and personal contact must be avoided whenever possible. Some medications are also known to be carcinogenic, which is considered cancer-related, so it makes sense to wear surgical gloves.

Like most of the above treatments, Mercurochrome is highly toxic, but then, so are formalin, household bleach, garden insecticides, battery acid, photographic developers and antifreeze. Provided they are treated with the utmost respect they are no more a threat to us than other toxins which we come in contact with on a regular basis.

Naturally, I assume that anyone having such a supply of medications, is constantly mindful of the dangers by prohibiting their access to children or animals. Keep all treatments and chemicals safe, in a high place, and locked away if necessary. Thoughtful discretion must be given to all elements of safety while handling or preparing any medications, giving equal consideration to disposal of all solutions after use.

I hope that this advice proves to be of some benefit. I have not intended it to be the last word in fish treatment, as there are obviously more medications available than listed here. The above paragraphs have merely been an exercise to encourage inexperienced Koi keepers to think positively, while at the same time being prepared with some topical options to hand whenever that emergency arises.

With the above, we should have a good basis to improve our dispensary further as and when additional medications are recommended. There are no miracle cures and no medication can ever be considered bulletproof. It really comes down to being confident with a number of treatments which, in the past, have proved to be effective and proficient remedies. If it works . . . stick with it!

Talk to you soon!

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# Hosta Spectacular

Hosta convert **Derek Lambert** sings the praises of these beautiful easy-to-grow pondside plants

*Photographs — unless otherwise indicated — by the author*



**Halcyon TF1X7** has heavy, pointed blue-grey leaves.

**N**early five years ago, Pat and I moved to a new house in Lincolnshire. Several factors made us finally select the one we did. The first was the double garage, which had great potential as a fish room, and the other was the garden. Not that this was anything to look at, but the size and shape of it meant we had the potential to create anything we wanted to.

After we had been in our new home a few months, the farmer at the back of our property started to fill in a natural garbage-ridden pond. This made the endemic newts homeless, so I quickly dug a new pond and stocked it with various aquatic plants and lilies. The newts, being smart creatures, soon sussed out this new habitat and moved in.

When Pat and I were planning our pond, we decided to try to make it as natural looking as possible. The paving slabs around the edge of many garden ponds may make them look neat, but for newts and frogs trying to move in and out of the water, they can be insurmountable hurdles. So, instead of this, the liner at the back and sides of the pond was buried in the earth, so as to create a natural ledge of boggy earth going down to the water.

## Waterlogged decision

This worked very well for the marginals, although some of the reeds were too invasive for this type of situation and had to be removed. It did, however, create a damp area near the pond which could be very waterlogged during some parts of the year.

After a few years of trying different plants in this area, I finally decided to go for what all the books told me would make ideal subjects — Hostas. My reluctance to do so really stemmed from a basic dislike of so-called 'foliage' plants. To me a plant without a period in flower was a waste of space; unfair I know, but that was the way I felt.

After looking around the offerings in my local garden centres, I was still uninspired by the plants on offer, but luck was about to turn my way. I found out a friend of a friend grew Hostas for a living and had many of the rarer varieties which were normally unavailable through the trade. So off Pat and I went to visit Nancy.

It was early in the year and the Hostas would not be showing any growth yet, but Nancy told us all about the different varieties and showed us photographs of many hundreds of types she worked with. To my surprise, I found they actually did have flowers and many of them were even scented. The difference in size, leaf colour and texture was also much greater than I expected. Instead of a few plants to try out, we came away with a sizeable collection of roots!

## Preparations

While Hostas are tough plants and will grow in quite poor soil and in very shaded positions, they do better if the ground is properly prepared before they are planted. All this means is that it should be dug over and some well rotted horse manure or a slow-release fertiliser added to give them the best possible start. The ideal planting



**The appropriately named Ogon Gold** — one of the smaller varieties.





**MAIN PIC** — Hostas — seen here in bloom in the centre — can grow into very attractive clumps for the area immediately bordering the pond edge.



The variegated variety *Yellow-splashed Rim* is one of my favourite medium-sized choices.



The blue-grey leaves of *Krossa Regal* make it my top Hosta choice.



*Gracillima* is one of several good miniature Hostas.

time is now, but any time from October to late March will do for bare-rooted plants. With care, container-grown plants can be planted at any time of the year.

The ideal site for Hostas is in partial shade, but they will tolerate deep shade or even full sun. The best leaf colours of the golden varieties are shown in light partial shade.

The only real pests which can cause serious damage to your Hostas are slugs and snails. They seem to smell this lovely delicacy from miles away! Since the ground is damp and the area is generally shady, they seem to think they have found paradise in your garden. Hundreds collect around your lovely Hostas and enjoy a banquet every night.

## Pest control

To stave off these evil pests, most gardeners use slug pellets to protect their plants, but being so close to the pond, some of these might fall in and kill the wildlife living there. Fortunately, there are several environmentally friendly alternatives to these chemicals.

When my father was a young lad he spent his holidays on a landowner's estate, and one of his morning jobs was to go round all the turned-over flower pots and collect up the slugs and snails which had gathered there to feast on the lettuce leaves left as bait. I have tried this method myself and can vouch that it works like a dream.

Another, which our editor John stumbled across by accident (someone had tossed some open beer cans over the garden wall), is to leave nearly empty beer cans lying on their sides overnight. In the morning you can collect these up and dispose of the dozens of slugs which have moved in. There are various methods of disposing of them, such as killing them outright or throwing them out in the rubbish bags, but please don't release them among the next door neighbour's prize-winning Dahlias!

## Hosta choices

The *Hosta* genus contains only 20 or so species, but by hybridisation and careful selective breeding, many hundreds of varieties have been created. Since there are so many of these, it is impossible to describe and list them all. However, the following are some of my favourites selected from those I am growing at the moment.

### 1 Mini varieties — under 20cm (8in) maximum height

*Gracillima*. This variety has very small leaves which quickly form a thick mound. It also produces large numbers of attrac-

tive flowers, making this one of the prettier miniature varieties.

*Princess of Karafuto*. This variety has dark white-bordered leaves and lavender-striped flowers.

### 2 Small varieties — under 25cm (10in) maximum height

*Golden Tiara*. This variety has green leaves with gold edges. It grows very quickly to form a mound or border.

*Ogon Gold*. This is a pretty yellow *Hosta* which shows its best leaf colour when in sun or partial shade. It makes a nice contrast with the green and blue Hostas.

### 3 Medium varieties — from 25cm to 45cm (10-18in) tall

*Halcyon TFX7*. This is a really choice variety with deeply veined, heavy blue leaves.

*Yellow Splashed Rim*. Long pointed green leaves with a lovely yellow rim, make this a worthy addition to any *Hosta* collection. However, it is even more prone to insect and slug attack.

### 4 Large varieties — 45cm to 62.5cm (18-25in)

*Krossa Regal*. This is, by far and away, my favourite *Hosta*. Its vase-shaped powder blue-grey leaves form a very striking mound. It also has orchid flowers; a very regal, classic variety.

*Sun and Substance*. The heavy-substantiated gold leaves form a very large mound.

### 5 Some other choices

A couple of varieties which I can recommend, but cannot afford myself, are two new introductions from the *Hosta* master, Herb Benedict.

*Blue for You*. This represents a real step forward for the blue varieties. It has intense blue leaves which are heavy-substantiated and produces white flowers with vestigial leaves. This variety will set you back about \$125 in the USA; I don't know if it is even available in Europe yet.

*Bridgroom*. This new variety has 20cm x 25cm (8-10in) dark green leaves with a satiny sheen. The petiole and centre part of the leaf extend upwards, while the sides of the leaf blade slope downward. This is a unique variety, which is the first of its kind. Unfortunately, at the American *Hosta* Society auction in 1992, it fetched \$500 and will still set you back \$200!

By selecting a range of sizes and colour forms, it is possible to create a stunning carpet of Hostas which enhances the oasis-like character of any water garden. They can also be used around the base of trees and shrubs, where few other plants will thrive. Hostas have even made me take a second look at the other 'follage' plants!



# NATURALIST'S NOTEBOOK



BY ERIC HARDY

## British anglers

The angler fish depicted in **Fascinating Fish Facts** in August's *A & P* reminded me not only of the common British *Lophius piscatorius* that swallowed a Red-throated Diver through its mighty maw before capture in my own area, but also that, last year, British waters yielded another species.

Exhibiting the group's enormous disparity in the female angler's size, 1994's new British species, *Cryptopsarus roulei*, was found in a trawl of Hake, Saithe and Monkfish at 130 fathoms, 30 miles west of Eshaness in the Shetlands, and is now in the British Museum. It had previously been recorded off Iceland and Gibraltar, as well as Madeira and the Azores.

As in many anglers, the tiny male finally lives as a sperm-producing parasite attached permanently to the belly of the huge female. He's only a quarter her size, which is up to 350mm (c. 14in).

It is a seemingly blind, "eyeless" bottom-living fish of great depths. In the female, the eyes are very small and dorsal. Her main distinction is having three caruncles or small outgrowths on the back in front of the dorsal fin, and minute skin spines. Her dorsal tentacle in front of these is waved like angler's lure to attract prey, hence the name angler. Other relatives have large eyes to see in dark waters.



Among other anglers, *Gigartus filibulosus* has been taken off the Irish Atlantic slope, *Oncorhynchus anisacanthus*, *O. carlsbergi* and *O. schrichti* also off western Ireland, where the Big-eyed Frogfish *Antennarius radiatus*, has also been caught. As well as the common *Lophius piscatorius* inhabiting all western Europe and Mediterranean seas, *L. budegassa* has an almost equal distribution, except for Norway and the north Baltic. That makes eight British anglers. Our common angler ranges across the Atlantic to Newfoundland and Delaware Bay, wintering in deep water. It spawns from February to July.

## Leathery casualty

A 6ft Leathery Turtle drifted to the Lancashire coast at Alnsdale last August. This specimen was not only a representative of the most frequently seen of British sea turtles but, like many seals and other larger sea creatures, was so gashed by a ship's propeller which killed it, to be beyond museum restoration.

Drifting on the Gulf Stream from the Caribbean, this species has a thick, blubbery belly tolerating a greater range of temperature than others; it's also able to dive to greater depths. It's the largest of the world's 22 turtles, the biggest at nearly 10ft. It's easily

**BOTTOM LEFT:** Model of a female Mid-Atlantic Angler (*Linophryne brevibarbatula*) prepared by the late A. Fraser-Brunner for a pre-war exhibit at the Natural History Museum.

**BELOW:** Green Turtles are occasionally seen in British waters.



identified by six or seven keels, or ridges, down its hard skin back, tapering to a tail-like point. It doesn't have the "tortoiseshell" scales of other species.

From eight to over a score enter British waters annually. Less often, we have four others; Loggerheads, Hawksbill, the Green and, smallest of all, the Atlantic or Kemp's Ridley Turtle.

## Controversial licences

Fish are subject to many predators, including birds. Much controversy is surging over recent shooting licences to control increasing Goosanders. Sawbill Fishing Duck now nesting on all major Welsh, western English and Scottish rivers, and increasing Cormorants. British Trust for Ornithology research shows that while Goosanders on the Tweed will take young salmon, their main prey is eels, a pest of fisheries. Cormorants there take more Grayling than salmon or trout. Licences to shoot Goosanders have been granted on Wharfe and Wye, and for Cormorants on Sandbach Flashes, etc.

Cormorants increased 6% annually to reach a British winter population of 19,000. British rivers now have 4,000 to 5,000 Goosanders. Over 10,000 have been killed by licence in Scotland in fewer than 10 years, over 250 shot in one year. Like Cormorants

and herons, they tend to take the weaker fish, thus improving the stock. Goosanders aren't protected against shooting in Scotland, as they are in England and Wales where licences are required. Ornithologists argue that a more serious study of their diet would exonerate them from much of the damage they are accused of causing game-fisheries.

Between 1982-92, 3,855 Goosanders, 3,282 Mergansers and 3,878 Cormorants were shot legally in Scotland as fishery pests. The estimated total British breeding pairs annually were 2,700, 2,150 and 7,000 respectively.

## Nature Notes

1 British divers off Gairn Ness, where the ladies team went aground off Orkney with such publicity, found no sign of any crabs on the seabed when they surveyed the area in August last year.

2 Bog Asphodel, a declining Pennine flower grown by garden ponds, had 11 yellow spikes last July in Salford Moss, on the Staffordshire side of the Cheshire border. Once called Lancashire Asphodel, it was first recorded in Lancashire in Lobel's *Apenninus* in 1670, 63 years earlier than Garard's *Ternus* floral guide in many books.

3 Another Pennine plant of wet places, Bog Star, a sedge-like known as Grass-of-Parnassus, *Parnassia palustris*, has a shorter-stemmed, larger-flowered maritime form, *condensata*, which evolved by mutation on damp dunes near Southport. There it massed in magnificent shows last August in the sandhills 5 miles south of the four-path-able pair Dhone Road's Toad Hall, and near the reserve's Petrol Path.

4 The maritime form of Round-leaved Wintergreen, which also evolved by mutation in these stacks remained scarce after its decline in recent dry years.

5 In July, I saw the same damp "dune-plant" full of pink flag Pimpernel and the drooping heads of Marsh Helleborine *Oxycodon* by the public path. It's the high water-table of rain, which keeps these *Analisia* Fenside dunes so rich in rare wetland plants.





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### AQUARIUM CARE

**Aquarium size:** 36 x 12 x 18in (90 x 30 x 45cm), minimum, but the bigger the better.

**Aquarium decoration:** Plenty of rock-work to provide caves.

**Temperature:** 25-28°C (79-82°F).

**Water:** Hard and alkaline (pH 7.8, 20°DH approximately).

**Diet:** Commercial pellets, some live or frozen food.

I arrived one afternoon to find the female vigorously cleaning a flowerpot, while the rest of the mbuna, including the young male *lombardoi*, were confined to the other end of the aquarium. She then started spawning on her own, laying a few eggs at a time and then picking them up.

The male did venture out a few times, but was immediately chased back to his hiding place. The female developed a distended buccal cavity but this disappeared overnight.

In order to try to establish the male *lombardoi* as a dominant fish, I removed the large female to a separate small aquarium one week before she was due to spawn.

The male had now asserted himself somewhat on the rest of the mbuna.

After a week of isolation on a diet rich in earthworms, and approaching spawning time, the female was introduced back into the main aquarium. She soon re-established her dominance, and a few days later, spawned by herself once more and ate her eggs.

### Surprise spawning

By now, I thought I had seen everything, but I was in for an even bigger surprise. Some two weeks later, I walked into the room to see the female Golden Zebra acting very aggressively. She was exhibiting male courting behaviour of fin flaring and body shivering movements to a large gravid Aurora Cichlid (*P. aurora*). Now, Auroras look nothing like *lombardoi*, although they do grow to about the same size. (Male Auroras have a bluish body base colour with a yellow breast, while females are a brownish colour all over). I did not have a male Aurora at this time.

The female followed the female *lombardoi* to a flowerpot and proceeded to lay eggs while nudging the female *lombardoi*

in the anal fin region, followed by picking up of the eggs. This odd spawning spilled onto the gravel and several of the eggs were devoured by other mbuna before they could be picked up.

The 'pair' were less able to keep the other mbuna at bay and the spawning proceeded from one flowerpot to another and also on the gravel. The female Aurora ended up with a distended buccal cavity but, of course, nothing came of the spawning.

### Multiple plusses

Golden Zebras are medium-sized cichlids, where females are as colourful as males. They are robust fish which thrive in a fairly crowded environment with other similar-sized mbuna, provided aeration and filtration are good. They are always active, with a lot of interaction between species in a mixed mbuna set-up, thus providing a constantly changing montage of colour and action.

*Lombardoi* exhibit interesting social and spawning behaviour and produce fairly large, well developed colourful fry, which are easy to raise.

The unfertilised spawnings that I witnessed, and the female taking the male role in an inter-species spawning, are unlikely to occur in Lake Malawi, where there is a free choice of counterparts. Rather, it is probably limited to the confines of an aquarium set-up, where social pressures and the choice of mates is not always ideal.

I have derived a great deal of pleasure from studying the species and will never grow tired of seeing a shoal of the beautiful blue and black fry with their mother.



The young (these are approximately four weeks old) are beautifully barred.

### FURTHER READING

Ad Konings, *Ad Konings's Book of Cichlids and all the other Fishes of Lake Malawi*, 1990, Tropical Fish Hobbyist Publications Inc.

Ad Konings, *Malawi Cichlids in their Natural Habitat*, 1989, Verdun Cichlids.

H. B. Axelrod and W. E. Burgess, *African Cichlids of Lakes Malawi and Tanganyika*, 1986, Tropical Fish Hobbyist Publications Inc.



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All letters must be accompanied by an S.A.E. and addressed to:  
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Herpetology: Julian Sims, Kol, Alan Rogers, Tropical, Dr David Ford, Coldwater, Pauline Hodgkinson, Plants, Barry James, Marine, Gordon Kay.

## PLANTS

### Threaded Oase

I have purchased an Oase Aquadex pump for my waterfall system. I now wish to add a fountain, but due to the fact that there is no thread on the outlet, I am finding this a difficult thing to do. Any suggestions?

Oase have now produced a threaded adaptor to solve this problem. Please contact your local Oase stockist for details.

### Lobelia in aquaria

I have some *Lobelia cardinalis* growing in my pond. I see the same plant advertised as being suitable for aquaria. Is this so? If it is, is it then

suitable for tropical aquaria?

*Lobelia cardinalis* is a plant which exhibits some degree of polymorphism in its growth cycle. It is capable of growing in several inches of water or in moist well-drained soil.

If grown in water, the first stems produced in spring are thick and fleshy and light green in colour. These start life underwater. If this form that is sold for aquaria.

*Lobelia* is not really suitable for tropical aquaria, but will succeed for a time in temperate ones. With the lengthening days, the stems grow more woody and elongated, and both the stem and the leaves turn bright red. Eventually, they reach 2ft (60cm) or more in height and in mid-summer, produce the glorious scarlet flowers.



The beautiful summer blooms of *Lobelia cardinalis*.

## MARINE



Puffers are generally tough, robust choices for large-fish communities.

### Compatible choice

I am starting to stock my newly matured marine tank. I want to keep a moray eel, a Dog-faced Puffer, a large angel and another species. It would be either a surgeon or a butterfly. The tank holds 80 gallons net.

Would these fishes be all right together?

You don't say how you will filter the aquarium, but with the moray and the puffer, you plan to have two of the messiest feeders in the hobby. Make sure that your filtration is 100% efficient, with a protein skimmer to help with the load.

As for your stocking, the mix will be fine. If you add a surgeon, I would choose a Powder Blue. However, a butterflyfish of any species would be a definite no-no. It wouldn't stand a chance in that company.

### Unwelcome holiday return

I returned from holiday recently to find my entire collection of marines dead. I've taken them all out and drained the aquarium. What should I do next?

My advice would be to completely eradicate any reason for the demise of your stock by sterilising your aquarium. This is done by filling the tank again (tap-water will be fine) and adding a cupful of bleach to every 20 gallons of water. Throw in all the rockwork and any equipment you may suspect with it, and let the whole thing run for a day or so.

After that, neutralise the chlorine with sodium thiosulphate, then complete with a couple of tubs of the aquarium. You can then start again, as though you were starting with a completely new aquarium. You will, of course, have to mature the filter all over again.



## TROPICAL



M.P. & C. PETERSON

Modern-day medications make it possible to treat scaleless fish like this Clown Loach safely.

Dosage was hit and miss, but everyone soon learned that scaleless fish, such as loaches and some catfish, were more susceptible to chemical damage than scaled fish.

Nowadays, commercial remedies are widely available from reputable companies who carry out the necessary research to make these treatments as effective, and yet as safe, as possible. Just follow the instructions, and you will not harm scaleless fish.

If you prefer to be a DIY fish doctor, then be careful of dose levels with the sensitive fishes. The use of just salt for ectoparasites is a wise choice, but it may not be as effective as more powerful chemicals.

### Medications and scaleless fish

Is it true that homemade fish preparations and chemicals (as well as

commercial ones) can't be used with scaleless fish like cats and loaches?

I was told to use salt to combat parasite infections instead.

In times past, there were no commercial remedies and aquarists made their own... they used chemicals such as Methylene Blue, Malschitz Green, Acriflavine, salt, iodine, etc.

## KOI

### Night-biting Koi

As a fairly new Koi keeper I am a little confused at hearing Koi at night during the normal growing season should be avoided. As an angler of many years' experience, it is quite common knowledge that most fish "bite at night". A little clarity here would be appreciated!

While never having been an angler myself, I would accept your statement by the proficiency of your angling experience. I believe the comment has arisen from the respected remnants of "an old wives' tale", and probably referred to in cases of an unsuitable pond design containing an abundance of plant life.

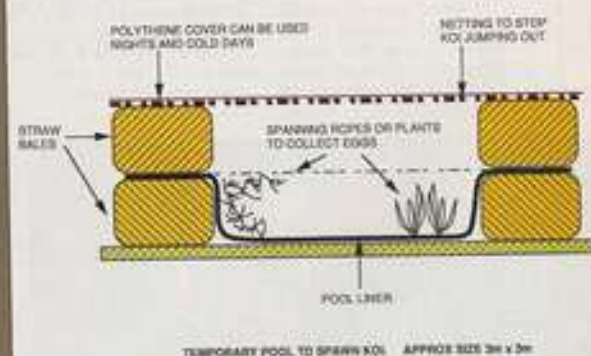
The natural occurrence of living plants within a closed environment, results in the cessation of the oxygen production which takes place during the day; carbon dioxide, however, continues to be produced at night. This is all part of the photosynthesis cycle.

Naturally, such a situation results in very low, to dangerously low dissolved oxygen levels at night, particularly during warm evenings. Often, in the past, aeration devices were mistakenly switched off at night. Many hobbyists therefore observed fish gasping on the surface searching for additional oxygen during the night. In several cases, many fish died under such conditions, and early pondkeepers mistakenly blamed these deaths on late evening feeds and undigested food.

The Koi keeper of today is very aware of the dangers and dissolved oxygen levels rarely fall below safe levels with modern aeration devices, so if common sense is applied at all times, feeding at night is enthusiastically welcomed by most Koi!

### Pool-less move

I will shortly be moving house and, obviously, want to take my six Koi



Temporary pools (in this case, adapted for spawning) are very useful 'tools' to bear in mind.

with me. However, there's a problem: the new house hasn't got a pond! What do I do?

All you can do is contact someone who will offer to find temporary accommodation for your Koi until you are ready to receive them.

Other people have overcome situations like this by

erecting temporary/portable paddling pools, just as a short-term measure.

Although winter accommodation in such set-ups needs special care regarding feeding, aeration, filtration and temperature fluctuations.

...I guess it really depends on how attached to these specific Koi you are.





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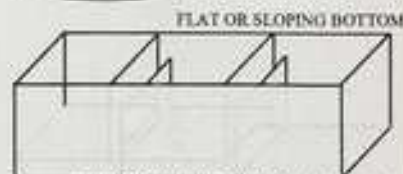
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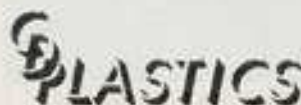


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## COLDWATER

### Tackling Mouth Fungus

I recently purchased some very pretty fish, but all now have become sickly and it appears that there is a fungus around their mouths. What can I do, as I have tried some anti-fungus remedy but it hasn't helped?

The infection you describe is caused by the bacterium *Flexibacter* (not a fungus) which often attacks fishes kept in unhygienic conditions. The mouth region can be almost eaten away by this disease which, of course, means that the unfortunate fish has no possible chance of recovery.

It really is vital that treatment is given at the first sign of infection and, while some subjects may respond to the proprietary remedies for fungus infection, the fish will have a better chance of a cure if antibiotics are added to the water. These are only available from a vet.

### 'Tubercled' female Goldfish

I have been told that the female Goldfish can also develop breeding tubercles which would normally signify that a fish is male. Is this fact or purely fiction?

It certainly is, indeed.

In fact, I, myself, have had female Goldfish which have developed tubercles. Some of them not only developed them on their pectoral fins, but also on their gill covers; one even had them on her pelvic finnage!

All these fish proved to be true females and each spawned successfully with their various partners, resulting, each time, in a high fertility rate.

### Hood food

I am keen to try to breed good - quality Lionheads. I have seen special Lionhead food on sale which is purported to help develop the hood on both Lionheads and Orandas.

Is it really essential to feed special food to these fish for them to develop large hoods?

I have bred Lionheads for many years and have certainly given this type of food a trial over a period of time. Half of my fish were given the special food as a basic diet, while the others were fed a good variety of live and proprietary dried and flake foods.

The results were the same at the end of the day; some fish grew magnificent hoods, while others did not, and this applied to both batches of fish. I personally think that the important factors are the genes carried by the fish.



STEPHEN SMITH

Although — as in this case in a Blue Oranda — breeding or nuptial tubercles are usually only found in male Goldfish, females can develop them as well.

## HERPETOLOGY

The vast majority (all?) of the Axolotls available through the trade today are captive-bred.



### 'Dispersing' captive-bred Axolotls

I have a breeding colony of Mexican Axolotls (six adults). This is the first year that they have successfully bred, so I now have about 100 babies. It seems that I'll soon have many more.

I've sold some to local pet shops, but would welcome some advice on how best to 'disperse' them further, especially since they are endangered in the wild.

In the wild, Axolotls occur naturally in only two high-altitude, coldwater lakes to the south of Mexico City — Lake Xochimilco and Lake Chalco.

Unfortunately, this natural environment is threatened by excessive pressures from tourists and water extraction, hence the desirability of dispersing captive-bred specimens within the trade and hobby.

Currently, very few (if any) Axolotls are imported directly from Mexico. The vast majority which are available through the trade are captive-bred individuals. Indeed, captive breeding could be an important conservation measure, because these amphibians have such a limited distribution and are endangered by habitat destruction in the wild.

There is however, one problem. The genetic purity of captive populations of Axolotls is certainly in doubt. Due to past hybridisation with neotenic species of salamander from North America, together with selective breeding for body coloration, very few of these captive amphibians have the genotype of the

true 'wild-type' Axolotl.

With regard to the dispersal of your captive-bred Axolotls, I would first be inclined to place details in the advertisement section of the regular monthly newsletters of the leading herpetological societies and the quarterly Bulletin of the British Herpetological Society.

You could also try some of the specialist suppliers — several of them now advertise regularly in A & P. In addition you could check in Exchange & Mart, published weekly, or the Yellow Pages of your local telephone directory. Finally, you could, of course, place your own ad in A & P!

### Snake books

Would you please suggest a few good books on snakes?

Helpful books about keeping and breeding snakes in captivity include the following:

① *Snakes & Lizards — Their Care and Breeding in Captivity* by John Coburn. This book is 206 pages in length and is published by David & Charles, 1987. £18.

② *Keeping and Breeding Snakes* by Chris Mattison. This book is 184 pages in length and is published by Blandford, 1988. £18.95.

③ *A-Z of Snake-Keeping* by Chris Mattison. Containing 144 pages, this book is well illustrated with colour and black and white photographs taken by the author. Published by Merehurst in 1991 at an original cost of £14.99. However, this book has recently appeared in 'remainder' and discount book shops at a bargain price of around £5.98.



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Two views of our twenty-year-old . . . and still going strong . . . indoor Goldfish pond.

# A Pond for STARGAZERS

Michael Gilroy offers his suggestion for an attractive alternative to the 'glass rectangle'

*Illustrations by the author*

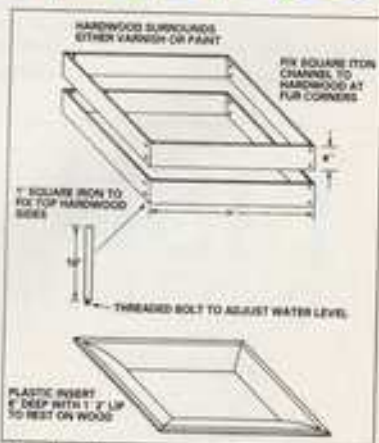
A small indoor Goldfish pond makes a nice alternative to the conventional aquarium. As you can see from the photographs and the accompanying sketch of our twenty-year-old system, it is of a very simple design. It consists of a plastic container that is approximately 2ft square by 6in deep (c 60 x 15cm). Blue gravel is used in the bottom, but any other alternative would, of course, be equally acceptable.

The container itself is built into a hardwood frame that has adjustable metal legs (see diagrams). This, in turn, is mounted on a stone plinth surrounded by house plants.

The pump used is of the type that provides a small waterfall. Combined with the external planting, the whole set-up provides a very attractive indoor pond.

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Another benefit is that the fish become quite tame, eventually (if you are patient) feeding from your hand. We have had various types of Goldfish over the years; at the moment, the pond is occupied by a pair of Celestials. These have proved to be the ideal occupants. Their eyes look upwards (they are sometimes known as



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Stargazers) and, therefore, they see you as soon as you approach the pond. Very soon, they learn to eat from your fingers; the best feeding we have found is the small floating sticks.

As mentioned previously, we have tried

other types of Goldfish, but have found fast-moving varieties are unsuitable. For anyone interested in this type of pond we feel it is advisable to use only slow-moving types such as Pearlscales, Bubble-eye, Lionheads and the like.

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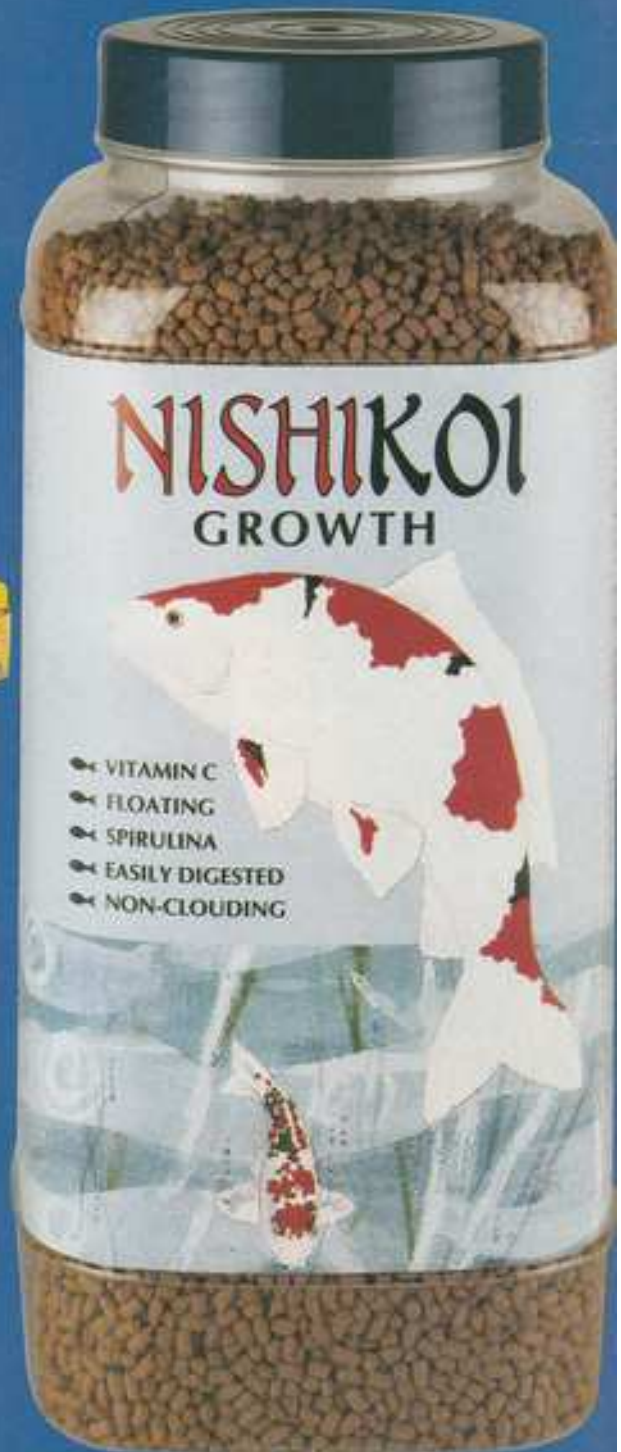
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**T**here are over 100 individual varieties of Koi and, in many cases, the differences between them are very subtle. If you are keen to learn more, the topic of Koi varieties is a subject in itself, but if you prefer just a working knowledge of the main types, then that's fine, too, of course. As with many aspects of Koi-keeping the choice of how much or little to go into any aspect, is totally a matter of individual choice.

One thought, however: although individual choice is vital, knowledge and information are also powerful tools in Koi 'smart' selection. By investing a little time and effort into understanding in detail what the main factors are, you may just find that you will make more informed purchase selections and get increased enjoyment as a result.

Here, to start you off, are some of my thoughts on my top Ten Koi. As you will soon see, there are more than ten types mentioned, but these can all be grouped under ten main varieties.

## 1 KOHAKU

The Kohaku is the definitive variety of Koi. The classic elegance of white base colour with red pattern overlaid, defines the very essence of Koi. In the home of Koi, Japan, the enduring popularity of the Kohaku is linked to the fact that the red

**Nigel Caddock chooses his favourite Koi varieties and groups them under their main categories.**

*Photographs: Nishikigoi International*

and white combination reminds the Japanese of their national flag.

The simple complexity of the endless combinations of red on white offers limitless variations on the basic colour theme and offers true aficionados a lifetime's interest, hence the term "Koi keeping begins and ends with Kohaku", and never a truer Koi word was spoken.

Basic patterns are: continuous red (straight hi) and Inazuma (lightning pattern) stepped patterns: Nidan = 2-step, Sandan = 3-step, Yondan = 4-step, Godan = 5-step. There are also flowery contemporary patterns which have lots of white skin and unusual shaped red markings.

In addition to these, there are Tancho Kohaku: white Koi with a single red marking on the head.

## 2 SANKE

Sanke are, basically, Kohaku with black markings. The additional dimension offered by the black (*sumi*) markings renders Sanke one of the most popular varieties of Koi and, arguably, the most popular choice with UK Koi enthusiasts.

The location and quality of the *sumi* is of paramount importance. There are two types. Black pattern located on the white skin is called *Tsuno sumi* (pronounced *tsu-no*); black markings located on the red skin areas is called *Kasane sumi*.

*Sumi* should ideally be homogenous and



Four types of Kohaku: 1 — Sandan, 2 — Straight hi, 3 — Flowery pattern, 4 — Tancho.



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Two types of Sanke; a 'modern' type with little *sumi* and a metallic one (Yamatonishiki).

appear like a deep ebony gloss with fine sculpted edges. *Sumi* that is unrefined and greyish with unclear edges and opaque appearance, is invariably of lesser quality.

While always a matter of personal preference, *Tsubo sumi* appears more elegant and the basic quality of the *sumi* is the most important quality indicator. In recent times Sanke with less *sumi* have become preferred, although traditional Sanke with more extensive markings are still popular, too.

The Tancho version of the Sanke is the same as a Tancho Kohaku, except that Tancho Sanke has *sumi* on the white skin as well as the red spot on the head. The metallic Sanke is called Yamatonishiki.

### 3 SHOWA

Showa are black Koi with white and red patterns overlaid onto the base black skin. Although basically the same combination of colour as the Sanke, the key difference is that while Sanke are WHITE Koi with black and red patterns, Showa are BLACK Koi with white and red pattern. This subtle, yet fundamental, difference is best shown visually by comparing the photos of Sanke and Showa.

Some general pointers may also be helpful in this context. Showa tend to have more extensive areas of black skin and the black areas often go below the lateral, or mid-line, of the Koi; this is not the case with Sanke. Showa often have *sumi* on the head, face and mouth areas,



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**A Kindai Showa. Traditional Showa have far less white.**



**A beautiful Tancho Showa.**

while Sanke do not, and the pectoral fins on Showa often have *sumi* at the base only, whereas with Sanke, the pectoral *sumi* often appears like black stripes.

There are basically three main types of Showa. Traditional Showa have a relatively even balance of colour combinations; in Kindai Showa, white is the predominant colour, and in Hi Showa, red dominates. The Tancho version is, basically, a Showa where the only red present is the red spot on the head.

Showa also often change and develop at a fascinating rate, so if you are seeking a variety to select a young unfinished Koi to grow on, Showa is perhaps the most interesting of all varieties to choose.



**A metallic version of the Kindai Showa: the Kin Showa.**

There are two metallic versions of the Showa: Kin and Gin Showa. The Kin Showa is the metallic version of the traditional or Hi Showa and the Gin Showa is the metallic version of the Kindai Showa (lots of white skin; in this case, it's metallic as well).

#### **4 UTSURI**

Utsuri varieties are non-metallic black fish with either white, red or orange as the second colour. The most highly regarded Utsuri is Shiro Utsuri which is a black Koi

with white markings. These Koi are highly prized and have an intangible elegance which, for some reason, is not present in other Utsuri varieties.



**Shiro Utsuri are highly prized.**

Hi Utsuri are black Koi with red markings and Ki Utsuri are black Koi with yellow or orange markings.

There are three metallic versions of the Utsuri: The Gin Shiro Utsuri is the metallic Shiro Utsuri (black and white), the Kin Ki Utsuri is the metallic yellow or orange Koi and Kin Hi Utsuri is the black and red metallic Utsuri.



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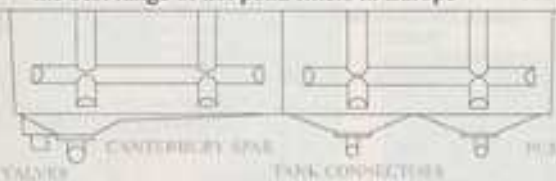
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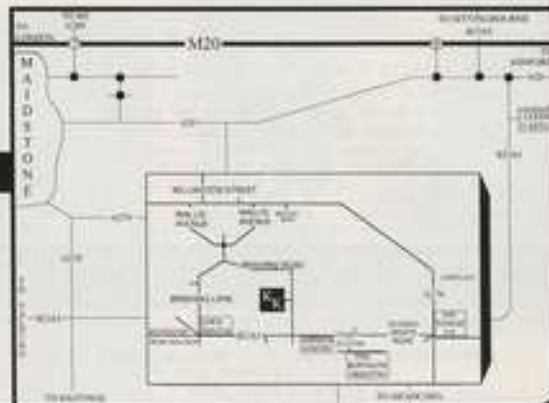
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## 5 SHUSUI/ASAGI

The non-metallic 'Blue Koi' are immensely popular and extremely attractive. The key difference between the Shusui and Asagi is that the Shusui is scaleless or Doitsu (pronounced *doitsz*) and the Asagi is fully scaled. Although these Koi look totally different, they are, in fact, the same variety.

Shusui, although scaleless, often have a single row of large 'mirror carp'-like scales running the length of the Koi. Sometimes they have just a few scales, sometimes none. In many instances, Shusui also have red markings interspersed with, or overlaid onto, the base blue skin. This can be extremely attractive and contributes much to their popularity.

Asagi have reticulated scales and also



Doitsu scaling identifies this 'Blue Koi' (despite the red) as a Shusui.



Asagi have fully scaled bodies.

come in many variations of the basic theme, sometimes with red markings, sometimes random, and sometimes in more defined pattern.

In both varieties, a clear, unblemished head is vital, and as both types have a propensity to develop black speckles in hard, high pH conditions, initial selection should prefer Koi without any black spots.

## 6 OGOON

Without doubt, the most popular 'first buy' is the Ogon, a perennial favourite. Its attractive metallic appearance proves irresistible to many newcomers who then

elevate their first love to 'would-never-part-with-under-any-circumstances' pond status. This was certainly the case for me, as it was the fantastic sight of a graceful whale-like 26in (66cm) Yamabuki that first grabbed me one May weekend. It was this Ogon that was primarily responsible for getting me hooked on Koi.

Our old Yamabuki Ogon (now with slight Matsuba inclinations) is 15 years old and, true to form, if you asked my wife who to get rid of: 'Pru' the Ogon, or me — I'd love! Ogon are metallic single-coloured Koi that come in three basic colours. The Parachina is a white Ogon, the Yamabuki is yellow and the much less popular (but



Yamabuki Ogon have a habit of becoming top favourites.



my personal favourite) lemon Ogon produced primarily for the Japanese market by top producers like Ogawa of Kyushu and Hasegawa of Ojiya.

Stunning examples of Ogon are widely available with an almost endless quality and price selection, with top Ogon producers like Choguro from the mountains of Niigata, to the top Israeli production Kibbutz Hazorea, close to Nazareth in Israel.

## 7 HARIWAKE

The ever-popular Hariwake is, basically, a plain coloured metallic white Koi with red, orange or yellow pattern overlaid. There are lots of variation on the basic theme and a much asked question concerns the difference between a Hariwake and a Kikusui.

The Kikusui is often misrepresented by references to 'wavy patterns', but the pattern is irrelevant. All Kikusui are doitsu and the key difference is the colour of the hi. Those Koi with deep orange or red pattern are Kikusui and the rest are Hariwake.

Someone told me once that the term Kikusui was invented by a Japanese producer with too many doitsu Hariwake on his hands! Following the tried and tested prerequisite that 'special anything' sell better, they invented a special name for the special doitsu red Hariwake and the Kikusui was born. Guess what — the new variety Kikusui (alias red doitsu



A particularly attractive doitsu Hariwake.

Hariwake) sold well, so the name stuck and the rest is history. The 'wavy pattern' angle came much later and added further to the mystique (confusion). Whatever they are called, they look fantastic in any pond!



Kujaku offer almost limitless variations in pattern.

## 8 KUJAKU

The Kujaku is metallic Koi which is a combination of two varieties: the Hariwake which is a white Koi with yellow, orange or red markings, and the

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Matsuba which is also a white Koi but this time with reticulated scales. The result of this is a Matsuba with red, yellow or orange markings overlaid onto the reticulated base.

These varieties are extremely attractive and offer enthusiasts of metallic Koi a further level of sophistication, with the subtle variations providing immense choice. Of all the metallic varieties, the Kujaku is perhaps the most acclaimed.

Koi purists tend to favour non-metallic varieties, but at a push, would readily accept Kujaku into the hierarchy. For most enthusiasts, the Kujaku is a 'must have' variety, and with some stunning examples in the UK and some extremely

accomplished examples generally available, the selection possibilities offer Kujaku enthusiasts lots of scope.

## 9 KIN GIN RIN

A further quirk of Koi genetics ensures that all varieties of Koi also come with reflective silver or gold scales. Some varieties have an increased propensity of Kin Gin Rin but I know of no varieties where Kin or Gin Rin has not ever occurred.

To clarify the difference between Kin and Gin Rin, both the types are classified together under one variety classification called Kin Gin Rin, but they are, in fact, two separate types under a single heading.

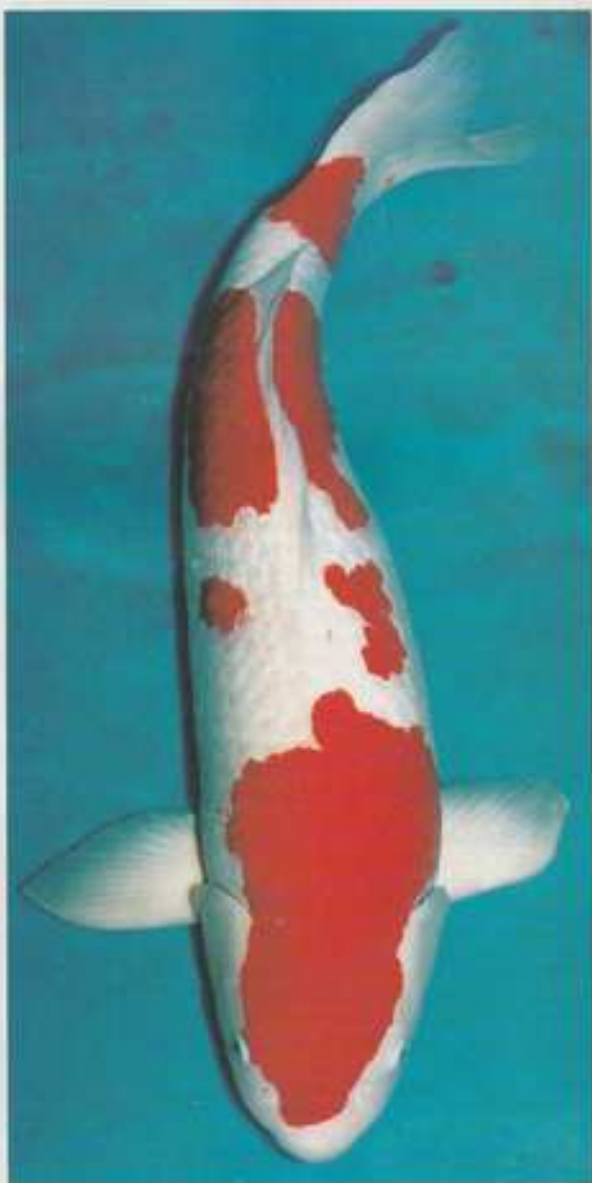
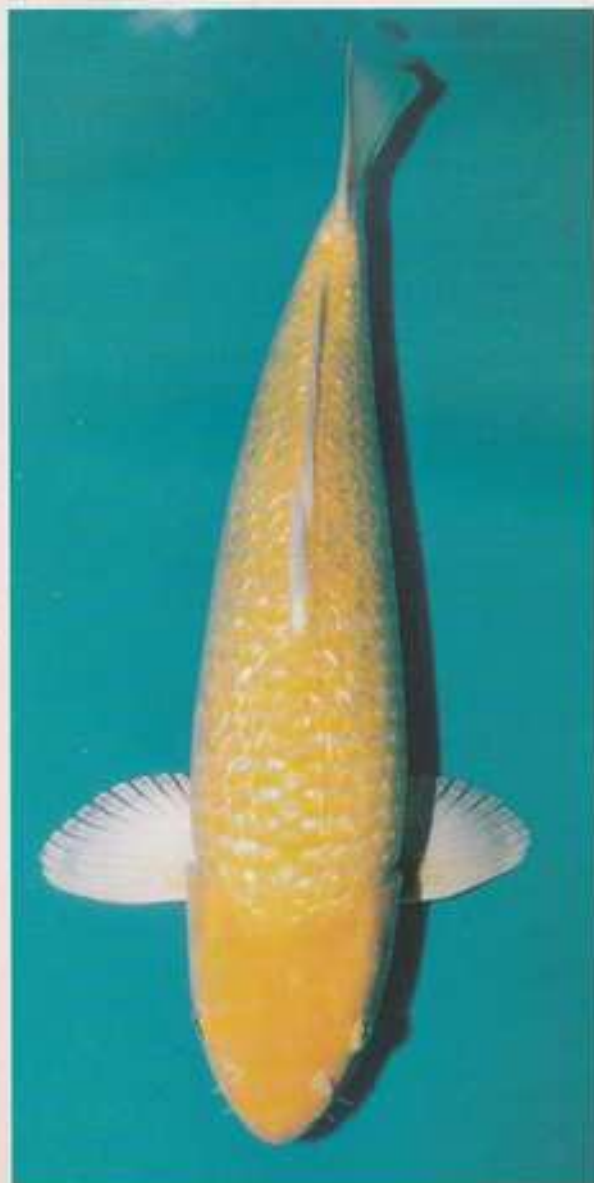
Koi with silver reflective scales are called Gin Rin and those with gold reflective scales are called Kin Rin. In specific Koi they are either Kin Rin or Gin Rin, thus Gin Rin Sanke (Sanke with silver reflective scales) and Kin Rin Kohaku (Kohaku with gold reflective scales).

There are also six or so variations of the actual manifestation of the scale type which are not specially relevant to this feature, although they may be of future interest to purists. What is perhaps more important is that the reflective scales should, preferably, be clear and bright, and ideally run in even symmetrical lines the length of the body. Interestingly for judging purposes, it is not just the Kin or Gin Rin scales that are assessed, but the entire Koi as well.

Finally, don't confuse metallic Koi and Kin Gin Rin Koi; they are not the same. The Kin

**BELOW LEFT** — A beautiful Israeli-produced Gin Rin Ki Goi.

**RIGHT** — An absolutely superlative 31-inch male Gin Rin Kohaku.





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Gin Rin scales often give the appearance  
of being metallic, but this is not necessar-  
ily the case, as Kin Gin Rin occur in both  
metallic and non-metallic varieties of Koi.

### 10 GOSHIKI

My final Koi is the Goshiki. Goshiki  
means five colours, although, personally, I  
have a real problem identifying them all  
and find this assertion most confusing.  
Perhaps a simpler definition would be a  
non-metallic Koi which is a cross between  
Sanke and Asagi, with reticulated scala-  
tion being present throughout all the pat-  
tern.

A very common confusion often made,  
even by experienced enthusiasts, is telling  
the difference between Koromo and Gos-  
hiki. It is actually not too confusing when  
we focus on the real differences. In  
Koromo, the scale reticulation is restricted  
to the areas of hi pattern with no incursion  
onto other areas, specifically the white  
skin. In Goshiki, however, this is not the  
case, with the reticulation NOT being  
restricted to the red pattern areas.

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# WATER'S EDGE

## INTERPET'S STANDARDS RECEIVE OFFICIAL APPROVAL



Many awards, although well-deserved, often come through automatically, as, for instance, those for long service, which the recipients are justifiably proud of. The truth of the matter is, deep down, that it is the standards we set for ourselves which are important. But setting one's targets high and then applying for someone else to judge them, looks like just asking for a rejection. However, that is exactly what Interpet have done, with exceptional success.

At first sight, the right to display the British Standards Institution's Registered Firm Symbol and be listed in the BSI Register of Firms of Assessed Capability in respect of the Quality System Standard, seems a pretty sober-sided way of saying that Interpet have put their own method of working 'on the line' and not been found wanting.

It should be remembered that this award is not one of the usual 'Best New Product' or 'Firm of the Year' Awards, or even specific to any of their numerous products. The internationally-recognised award (the coveted British Standards BS 5750, also known as the International Standards Organisation's ISO 9002) is for every conceivable part of the company's working methods, ranging from safety to quality control.

To grasp the importance of this recognition, it should also be appreciated that this is not a purely aquatic business award, it is the proficiency merit award which can be applied for by any manufacturer, no matter what the final 'product' may be. The procedure is that any company can put itself forward for inclusion on the BSI Register and then submit to the investigation team. In essence, each company is stating its own intent, lays down the parameters by which it wishes to be judged and, to some extent, almost dictates its own sentence; setting too high a standard is pointless, while a low standard, equally, achieves nothing.

The implications for every one of Interpet's onward customers — wholesalers, retailers, consumers — is that the level of operations has been seen to be consistent and accountability is there. Despite the awarding of the Certificate, issued after a lengthy, in-depth study of the Vincent Lane operations, more follow-up checks will be made in the coming year, with 'spot checks' after that — just to keep everyone on their toes.

You may wonder, having gained this pinnacle of achievement, what happens next. Armed with this prestigious award, the company will become even more readily-accepted throughout aquatic business circles. While its

own manufactured products are covered by the award, it is to be expected that any exterior-to-Interpet suppliers will want to be included as well, and this, technically, is within the company's power to do. Of course, a similar 'inspection' will need to be successfully overcome before this further 'knock-on' effect is expedited. This will then effectively 'guarantee' excellence, from original source to final consumer.

As reported in last month's **Water's Edge**, new Interpet products are already coming on line for 1995, with more to come. A happy coincidence, at the recent company-supported **Supreme Festival of Fishkeeping**, was the successful treatment and acclimatisation of Koi in the spectacularly large indoor pond, thanks to Interpet's products, and expert staff being on the spot ready to help. With its total expertise in (and I quote) 'the manufacture, sale and despatch of aquarium and pet products' now formally and internationally recognised Interpet has really achieved something to shout about.

We at A & P offer Interpet our sincere congratulations on their tremendous achievement and look forward to keeping you informed of all the new exciting products being lined up for 1995.



### THE INTERPET SIGN OF HAPPY SWIMMING!

Now it can be revealed. Any aquarium fish will tell you that the INTERPET logo means happy swimming; but to find it painted on a Greek island's jolly to indicate safety for humans swimming seems a bit far-fetched!

Actually, the symbol is not quite the same, but the company's chairman, Dr Neville Carrington, spotted it while on holiday during a visit to Limni harbour on the Greek island of Evia and couldn't resist using it to drive home the fact that Interpet have appointed Adrian Shepherd as a new export development assistant, and will be producing four-language packaging for all its products (we have yet to learn if Greek will be among them).

Details of all products from: INTERPET LTD., Vincent Lane, Dorking, Surrey RH4 3YX. Tel: 01306 881033; Fax: 01306 885009.



## KEEPING:

# The Blue-spotted JAWFISH

If jawfishes are not the perfect species for marine aquaria, they come pretty close to being so, as Svein Fosså's introduction to a particularly beautiful Pacific species shows.

Photographs by the author



The Yellow-headed Jawfish (*O. aurifrons*) is the most commonly seen species.



The aptly named Blue-spotted Jawfish (*O. rosenblatti*).

The family of jawfishes, Opistognathidae, consists of about 70 species, most of which are connected to coral reefs in the Indo-Pacific, eastern Pacific and Caribbean. They are all readily identifiable by being burrowing fishes with extremely large mouths and big eyes. Most species are cryptically (duskily) coloured, but a few display really beautiful, although rather 'tender', coloration.

So far, only the widespread Caribbean Yellow-headed Jawfish (*Opistognathus aurifrons*) has become well established as an aquarium fish. It is also, in fact, one of those (relatively few) marine fishes that readily spawns in captivity, and has been commercially bred in the USA for many years.

### Blue-spotted beauty

Here, I would like to present a much less frequently seen species — the Eastern Pacific Blue-spotted Jawfish (*Opistognathus rosenblatti*), which only recently has started to appear in Europe.

Adults of this magnificent, up to 10cm (4in) long, species have a beige to yellowish brown body entirely covered with numerous sky-blue spots. Juveniles are pale yellow without any markings.

In some 18-24 metres (c60-80ft) depth around many of the islands of the Sea of Cortez — its main distribution area — colonies of several hundred individuals may be found. More sporadically, it enters waters as deep as 50 metres (c165ft) and juveniles may occasionally appear in only 4-6 metres (c13-20ft) depth.

### Similarities/differences

Each individual fish has its own burrow, spaced some 1 to 3 metres (c3-10ft) from its neighbours' territories. Each burrow is elaborately constructed in the coarse sand and reinforced with shell fragments and pebbles. As other species of jawfishes, the Blue-spotted Jawfish is, seemingly, constantly renovating its burrow, excavating sand, and carrying, depositing and rearranging pebbles and rocks around the entrance.

As in related species, the Blue-spotted Jawfish is also a mouthbrooder, with the male carrying the eggs. In contrast to most other species, however, it displays striking sexual dimorphism.

### Spawning

During courtship, the male assumes a vividly contrasting coloration, with the body becoming practically white anteriorly and black posteriorly, but still displaying the blue spots. The female remains in the normal coloration of the species.

Courtship takes place in the water column above the entrance to the burrow; dozens of males may be engaged at one time. ▶





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◀ The male first leaves his burrow, ascending 30cm to 1m (12-39in) off the bottom. There, he hovers motionless with the fins fully spread. After 3-5 seconds, he suddenly dives into his hole with a flash-like whip of his tail. This sequence is repeated every 4 to 5 minutes, and may go on for hours until the female is persuaded to follow the male into his burrow for spawning.

## Aquarium care

In general, jawfish are very wary fishes. They sit at the entrance of their burrows watching out for plankton and other food particles, dashing out to collect the snacks as they are brought along by the current. At the slightest hint of danger, the fish rapidly retreat to the security deep inside their burrow-home, again to reappear 'suspiciously' after some seconds, or a minute or two, depending on how terrified they are.

In the aquarium, it is absolutely necessary to offer jawfishes a thick layer of coral gravel, with an abundance of coarse building elements, such as coral pebbles and mollusc shell fragments for reinforcement of the burrow. If there are other shelters available, such as a rock under which the burrow can be built, the fishes may do with thinner gravel layers. However, for the fish to be happy, there should, as a rule, be a gravel layer at least 15cm (6in) deep in some limited areas.

As the jawfishes are peaceful and shy, watch out for too-aggressive co-inhabitants, in particular, other fish which like caves and burrows and may try to force the jawfish out. For instance, this could apply to the Royal Gramma (*Gramma lorea*), and many groupers and sea basses of the family Serranidae.

Jawfishes, themselves, never seem to bother other fishes or invertebrates. Therefore, if the aquarium is large enough, it is worthwhile keeping several individuals together, but allowing (preferentially) some 200 litres (44gal) of water volume per individual.

When successfully introduced, the Blue-spotted Jawfish, as well as most of its relatives, is hardy and easily cared for, accepting most commercially available



All jawfishes are extremely wary.

foods. Transport does, however, seem to be a major strain, and the utmost care must be taken during the introduction phase in order to secure a gentle acclimatisation.

Most jawfishes that pass away too early, die within 24 hours after being introduced into a new tank, either from shock or by jumping out of the aquarium. As soon as a

fish has settled down to construct a burrow, the risk of losing it drops steadily.

The Blue-spotted Jawfish readily accepts aquarium temperatures from 18 to 26°C (64-79°F) and is an excellent companion for most other species imported from the eastern Pacific, as well as for the majority of other coral reef organisms.



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# FROGS AND FRIENDS



By JULIAN SIMS

## Amphibian sanctuaries

The value of garden ponds as breeding sites for Britain's amphibians is extremely important. At this time of the year, when masses of frogspawn have been deposited in garden ponds and groups of tadpoles are swimming about at the edge of the water, it is well worth remembering that many traditional freshwater habitats no longer exist in the wild.

Thousands of farm ponds have been lost as a result of building developments. Another reason for the loss of farm ponds is that water supplies are now piped to cattle troughs. Even when these structures are not being used by farm livestock, because they are raised off the ground and have sheer sides, they are totally unsuitable for amphibians to use as spawning sites.

Where housing developments have been built on agricultural land that once supported one or more ponds, adult frogs, toads and newts often return from this time of year onwards to spawn at their ancestral sites. Accounts have been published of Common Frogs spawning in puddles temporarily formed by a heavy shower of rain because their pond was no longer in existence.



A raised cattle trough which has replaced a farm pond that was a traditional amphibian breeding site.

If ponds have been installed in the new gardens, such problems seldom occur. The proud human owners not only have the enjoyment of 'amphibian watching' in their newly created havens, but they also benefit from natural pest control in the garden — juvenile and adult frogs and toads eat a lot of invertebrate pests, especially slugs and ants.

## User-friendly snake atlas

In the January 1992 edition of *Aquarist & Pondkeeper* (pages 41-42), our editor John Dawes reviewed the very substantial TFH book *The Atlas of Snakes of the World* by John Coborn. In particular, John commented about the weight of this book, at a staggering 96lb, equivalent to 4.3 kilograms!

Indeed, the book is of very large size, having dimensions of 25.5 x 35.5cm (10 x 14in) and is 591 pages in length. It also contains over 1,400 full-colour photographs. Not surprisingly, it costs £89.95.

This price puts the book out of the reach of many potential readers — a great pity due to the wealth of information it contains. Therefore, I am pleased to report that in 1994, TFH published *The Mini-Atlas of Snakes of the World* by John Coborn.



The new book has the user-friendly dimensions of 14 x 22cm (5½ x 8½in), contains over 950 full-colour photographs and is priced at the more affordable £29.95. Even so, it is still 736 pages in length.

This length reflects the intention of the author and publishers to reduce the price, while retaining the factual and pictorial quality of the original snake atlas. These goals have undoubtedly been achieved.

In the first Atlas, John Coborn brought together information about snake habits and habitats and applied this material to the requirements of these reptiles in captivity. As its title suggests, some of this material has been condensed in the Mini-Atlas, but John's aims and objectives remain the same. Information is delivered in three sections:

**Section one**, the shortest of the three, introduces the classification of snakes on a family and subfamily basis. Descriptions are supported by 15 simple line drawings by W P Mara.

**Section two** forms the bulk of the book. It is largely pictorial and contains most of the colour photographs, some of which have not been published before. Each photograph is accompanied by a series of symbols which provide

information about food items, whether a species is an egglayer or livebearer, whether it's venomous or not and gives its average adult length.

The final section provides information about the natural history of snakes and their accommodation in captivity, using glass, fibreglass and wooden terraria. Additional information is provided about heating, lighting, nutrition, handling, hibernation, hygiene (including examples of diseases with treatments) and captive breeding.

If, for whatever reason, you did not obtain a copy of the original Atlas, have a look at the more modestly priced but no less impressive Mini-Atlas (ISBN: 0-88622-601-X).

## Boa types

The Common Boa (*Boa constrictor*) is one of the best known and most popular snakes maintained in captivity. In the wild, they have a very extensive distribution through Central America, tropical South America and some of the islands of the Lesser Antilles in the Caribbean Sea.

Throughout this range Common Boas are found in a variety of habitats, including tropical rain-forest and semi-desert regions. Currently, eight different subspecies are recognised, and each has its own particular range.

When maintaining these different subspecies, it is worth remembering that each originates from a particular geographical region and has precise environmental requirements. For example, subspecies *B. constrictor imperator* is found in Mexico and north-west South America, *B. constrictor nebulosus* originates from the Caribbean island of Dominica and *B. constrictor orophias* from St Lucia.

*B. constrictor constrictor* has a very wide distribution, inhabiting central Brazil, south to Argentina and Paraguay. It is also found on the Caribbean islands of Trinidad and Tobago.

The two most southern subspecies are *B. constrictor amarali*, from Bolivia and south-east Brazil, and *B. constrictor occidentalis* from Paraguay and north-west Argentina.

It is also important that when captive breeding projects are undertaken, the genetic individuality of these subspecies is recognised and that unnatural hybridisation is not encouraged.



## HERP FACT

### Two forms of Adder

The Adder (*Vipera berus*) is Britain's only native species of venomous snake. However, there is another interesting fact about this species. Adders are one of the very few species of snake in which males and females are coloured differently. In fact, these colours are so distinct that it is usual to be able to sex a basking Adder from some distance.

Male Adders are, characteristically, more vivid, with a basic body colour ranging from various shades of cream or grey to a silvery white. The black markings on the dorsal surface are also very bold. These markings are particularly vivid after a male snake has sloughed its old skin prior to the breeding season — late April through to early May.

Female Adders are usually a more sombre reddish brown colour with black markings. These dorsal markings are not so well defined as those of male snakes.

The existence of two different forms (or morphs) within any population of animals (or plants) is known as *dimorphism* — the occurrence of different shaped submerged and floating leaves on Water Crowfoot plants (*Ranunculus aquatilis*) is a botanical example which will be familiar to many pondkeepers. The presence in a population of two sexes with very different external

features is known as *sexual dimorphism*. Human males and females are an example among the mammals.

The difference in coloration between male and female Adders is related to reproductive strategies. The bold coloration of males is related to the trials of dominance between rivals during the breeding season — the so-called "Dance of the Adders" (refer to A & P, April 1989, page 13).

In contrast, female Adders need to be able to bask without drawing attention to themselves. This is because they do not lay eggs, but give birth to live young. The females need to bask in warm sun so that the embryos can complete their development inside. A dull coloration allows the basking female to blend into her surroundings.

Due to this reproductive strategy, Adders have the widest distribution of the three species of British snakes. They even occur in the Borge and Strathy Forest regions of northern Scotland. This is because the females can search out basking hot spots to ensure the development of their offspring. Such success could not be guaranteed if females just deposited eggs in the ground and left them to develop if the prevailing environmental conditions of a particular spring and summer permitted.

Adders can be sexed from a distance, as the silvery white male and duller, more reddish brown, female shown in these pictures demonstrate.



### Licensed sales

In last month's edition of *Frogs and Friends*, I reported on the introduction of a General Licence which will replace individual licences issued by the Department of the Environment for the sale of Britain's more common amphibian species. It is interesting to note examples of the number of sales licensed under the Wildlife and Countryside Act, 1981 for these four species during the past 12 years. These are shown in the accompanying table.

Pondkeepers should not underestimate the positive impact they make on the practical conservation of Britain's amphibians. With the introduction of a general licence for the sale (and, therefore, wider availability) of these four species of amphibian, there has probably never been a better time to ensure that your garden pond supports a colony of native frogs and newts, or perhaps even the more selective Common Toad.

	1983	1988	1992
Common Frog	67,790	40,557	10,516
Common Toad	1,073	1,481	314
Smooth Newt	1,515	1,082	676
	284	190	146

(Figures supplied by the Department of the Environment)

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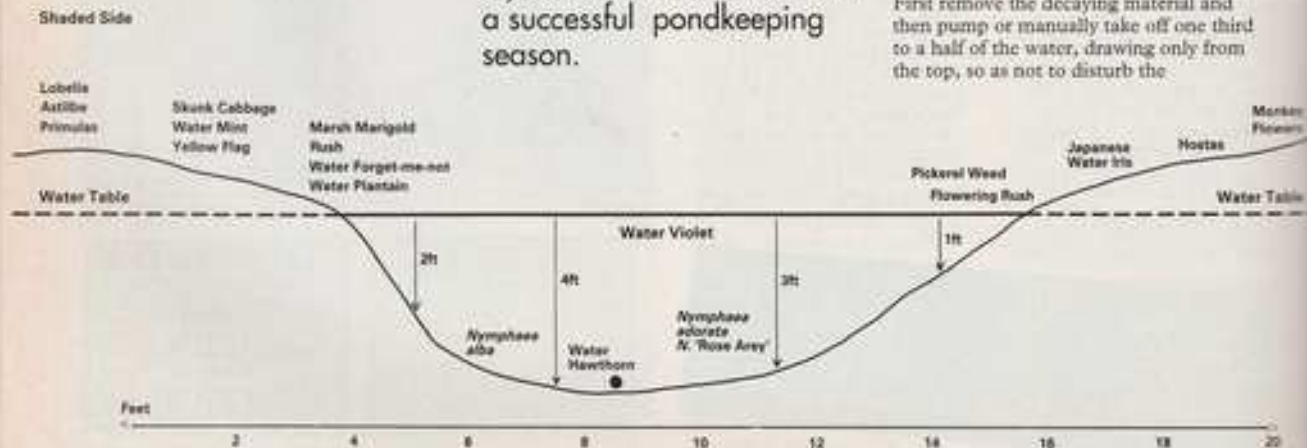


A well-stocked pond, no matter its size, will provide year-round colour.



**MAKE  
YOUR POND  
SAFE!**

**PLANTING SCHEME**



# Spring Pond Care

Susan Stephenson helps you lay down the foundations for a successful pondkeeping season.

Spring is perhaps the busiest time of year for the pondkeeper. After the long cold months, plants and animals are at their weakest due to depletion of food stores, but now nature takes on a sense of quickening activity as spring progresses. Therefore, the pondkeeper has a number of important jobs to do to keep pace and to prepare the pond to be a safe and productive environment throughout the rest of the year.

## Early checks

The state of the water itself should be noted and if it has become polluted due to decaying vegetation or other cause over winter, it may be necessary to change it. First remove the decaying material and then pump or manually take off one third to a half of the water, drawing only from the top, so as not to disturb the



aerobic/anaerobic balance or overwintering buds. Stored rainwater from a butt is best for replacing the volume but tap-water will suffice if this is not available. Water should be added from a hose at no more than a slow trickle.

Now is the time to inspect the pond and surrounds for any structural damage caused by severe frosts or other means over winter. It is better to carry out repairs now, while trying to avoid disturbing the deeper water, than when the pond is at the height of its activity later in the year. Damage needing repair should either be done now, or a note made if it can wait until the autumn, which is the best time of year to attend to repairs.

## Plant maintenance

On a reasonably warm day, fork over the soil in the water garden, removing any weeds, particularly Willow Herb (*Epilobium*). Top-dress with compost or bark chippings. Early spring is a good time to overhaul and generally tidy the margins and bog garden, thinning clumps of overcrowded Hostas, Astilbes, and similar plants, dividing and replanting where necessary. Leave *Trifolium* until after flowering.

If extra stocks of *Lobelia cardinalis* and Monkey Flower (*Mimulus*) are required, mid-March is the time to propagate them. Remove any straw used as frost protection, lift the clumps, divide them and pot into 8cm pots and place them in a cold frame. Plant out in early May when all threat of frost is past.

Thin out overcrowded marginals and remove any excess oxygenating plants. Remove any remaining dead leaves or other debris left from the winter. Dogwoods (*Cornus alba*) will need to be cut back soon after they burst into leaf to encourage new stems for the following winter.

Winter protection, such as leaves or ashes used for plants like the Giant Rhubarb (*Gunnera manicata*) may be removed, but remember that one of the vagaries of our climate is sudden late sharp frosts which can prove deadly to frost-tender new shoots, so be prepared to cover plants again for a short period when late frosts do occur.

If a frog population is wanted in the pond, now is the time to gather a little (healthy!) spawn and introduce it. When fish start to show signs of increased activity try a little food, gradually increasing it with their appetite. Too much food can mean some of it remains uneaten and may pollute the pond water.

## Spring jobs

Early spring is the best time to order seeds or plants and to plan your planting scheme in and around the pond. A simple plan is shown in the accompanying diagram. It is designed so that there is always something coming into flower following on from another variety; it is also a low-maintenance plan.



'Rose Arey' — a great medium-sized lily.



Seedlings whether sown under cover — as these Giant Cowslips are — or 'naturally' sown in the open, will require thinning during the spring.



Marsh Marigolds are almost synonymous with spring.



If you are introducing frogspawn into your pond this spring, make absolutely certain that it comes from a source that was totally free of the epidemic known as 'Red Leg' last year.

## SPRING JOBS

- 1 Check general state of pond surrounds and water quality, drain some of the water if necessary and replace volume.
- 2 Inspect pond and repair any damage caused, where absolutely necessary. If it can wait until autumn, make a note to attend to it then.
- 3 Lightly fork and dress margins and thin out excess plants.
- 4 Tidy bog garden and thin/propagate plants where required.
- 5 Remove pond heaters.
- 6 Plan/revise the planting scheme and order any new plants required.
- 7 Check fish for activity and begin feeding when necessary. Introduce frog population if desired.

## PLANT SPECIES CHECKLIST

Common Name	Scientific Name
Lobelia	<i>Lobelia cardinalis</i> , <i>L. fulgens</i>
Monkey Flower	<i>Mimulus</i>
Water Nast	<i>Menyanthes aquatica</i>
Marsh Marigold	<i>Caltha palustris</i>
Water Forget-me-not	<i>Alyssum aquaticum</i>
Yellow Flag	<i>Iris pseudacorus</i>
Japanese Water Iris	<i>Iris laevis</i>
Giant Rhubarb	<i>Gunnera manicata</i>
Flowering Rush	<i>Scirpus cespitosus</i>
Water Plantain	<i>Alisma spp.</i>
Rush	<i>Acorus spp.</i>
Water Violet	<i>Najas spp.</i>
Water Hawthorn	<i>Apocynum androsaemifolium</i>
Hickory Wood	<i>Potamogeton amplifolius</i>
Mountain Lily	<i>Najas spp.</i>
Astilbe	<i>Astilbe spp.</i>
Primrose/Cowslip	<i>Primula</i>
Shank Cabbage	<i>Lysichiton</i>
Globe Flower	<i>Trollius</i>
White Lilies	<i>Nymphaea alba</i> , <i>N. stricta</i> , <i>N. 'Rose Arey'</i>



# 10 INTERPET STATE-OF-THE-ART FILTRATION SYSTEMS TO BE WON



Interpet Limited has the answer to all aquatic filtration needs — and to prove it, the company is offering five new **Pond Workers** (retail value £49.99) and five new **Prime 10** external aquarium filters (retail value £59.99) as prizes in this month's competition.

## For the Pond

**Pond Workers™** is an in-pond biological and mechanical filter which deals specifically with the most common problems experienced by pondkeepers: poor water clarity and water quality-related fish diseases. It is attractive, unobtrusive, easy to clean and can be positioned anywhere on the pond floor.

Each **Pond Workers** filters a pond up to 750 gallons in size (approximately 10 x 6 x 2ft) or a

pond holding a maximum of 360in of fish. For larger ponds, two or more filters are linked in series.

The filter works with all main brands of pond fountain pump and is simply connected to the pump's water inlet with a piece of 1in hose. The pump then automatically sucks water through the **Pond Workers'** filter, where it is mechanically and biologically filtered.

## For the Aquarium

The new **Prime 10** external self-priming aquarium filter is remarkably easy to use. In addition to its self-priming facility, it has multi-directional rotating inlet and outlet tap connectors, easy-to-use snap-shut clips and an integral O-ring.

The unit also has a multi-directional diffuser on the outlet pipe

and a built-in flow indicator on the inlet pipe to show when the filter medium needs cleaning. Both these are pre-shaped to fit any aquaria without kinking the supply pipes.

There is a single 1.5 litre filter media container inside the canister to ensure all water in the unit flows through the media, and the container has its own carrying handle.

All **Prime's** are supplied with a complete filter system, comprising carbon and coarse foam filters, polymer wool and **Bio-Media™** filter medium — so they are ready to use as soon as they are installed.

**Prime 10** has a flow rate of 300 l/hr and is designed for aquaria with capacities between 75 and 150 litres (16-33 gals).

## THE RULES

1. Write your answers to the competition questions on a postcard or stuck-down envelope.
2. Write your **FULL** name, i.e. including full first name and address, in **BLOCK CAPITALS** on your entry.
3. Send your completed entry to:  
**INTERPET FILTER COMPETITION,**  
Aquarist & Pondkeeper,  
Dog World Ltd,  
9 Tufon Street,  
Ashford,  
Kent **TN23 1QH.**
4. Closing date: entries must be received by **31 March 1990**, at the latest.
5. Only **ONE** entry per household will be accepted.
6. Entrants must be over 18 years of age.
7. No correspondence will be entered into regarding the competition.
8. The Judges' decision will be final.
9. No responsibility is accepted for entries lost, delayed or damaged in the post, and proof of posting will not be accepted as proof of delivery.
10. The 10 prizes will be awarded in order to the first 10 correct entries drawn at the end of the competition.
11. No cash alternatives will be given.
12. The winners' names will be announced in the **June 1990** issue of **Aquarist & Pondkeeper.**
13. This competition is open to all residents of the UK, excluding employees and families of **Aquarist & Pondkeeper, Dog World Ltd, Pet Business World, Interpet and their agencies.**

## THE COMPETITION

Simply write the correct answers to each of the following questions on a card or stuck-down envelope and return the completed form to A & P by the **end of March**. Winners, who will be randomly selected, will be notified by post.

1. **Pond Workers** filter is designed to fit:
  - (a) on the pond floor
  - (b) on the side of the pond
  - (c) in a specially constructed box
2. Each **Pond Workers** filters up to:
  - (a) 500 galls
  - (b) 550 galls
  - (c) 750 galls
3. The **Prime 10** external aquarium filter:
  - (a) is self-priming
  - (b) needs a siphon action to get started
  - (c) needs a separate starter-motor
4. The **Prime 10** external aquarium filter has a flow rate of:
  - (a) 150 l/hour
  - (b) 300 l/hour
  - (c) 450 l/hr





A floating carpet of Riccia seen from below.

## Versatile, rare Riccia

The most sought after, and also the most difficult, aquatic plant to obtain in Northern Europe is *Riccia fluitans*, commonly known as Crystalwort. Not listed (to my knowledge) by any continental or British grower, or indeed by any of the numerous aquatic nurserymen in South East Asia, this is a rather strange state of affairs. This cosmopolitan plant is a floating aquatic that is native to the British Isles, although becoming increasingly rare.

*Riccia* is a genus containing just two species. First described by Linnaeus in 1753, he named the genus after Piero Francesco Ricci, a Florentine botanist. The specific name "fluitans" simply refers to the floating habit of this plant.

*Riccia* is a Liverwort, those encrusting plants which are mostly found growing on moist or wet soil in shady places. One other genus, *Ricciocarpos*, contains just one species, *R. natans*, which also displays a floating habit.

The clumps of Crystalwort form small 'baskets' consisting of a much branched mass of flat, thin, rich-green strands of thalli ('fronds') approximately 1mm wide and mostly somewhat channelled. Under the microscope, interior air-spaces which give the plant its buoyancy, cause it to look as if it is divided into compartments.

These clumps form a carpet-like layer just below the surface. The growth of the 'mat' can be very rapid and it may be several centimetres in depth. If the water level falls, *Riccia* can grow on the

# GROWING TIPS

BY BARRY R JAMES

Photographs by the author

mud, where it forms a shorter form with broader thalli.

This delightful plant is almost unique among floaters in that it diffuses the light without blanking it out completely. It therefore acts as an inhibitor to algal growth. However, thread-like algae can be a pest as they intertwine with the *Riccia* and can eventually kill it if left unchecked.

*Riccia* is also excellent as a fry refuge and is the best medium to provide for bubble-crest builders such as gouramis.

Twenty-five years ago it was very common, and many of the old-style aquarium shops had a good growth of this plant in every tank. It would seem that the advent of powerful filters and

close attention to water chemistry, combined with more powerful light sources, has wiped out the species.

In the wild, ponds which I was familiar with in Dorset and which, for years, had reliable growths of *Riccia* are now devoid of it. Somebody should really do some research into finding the optimum conditions in which to grow this delightful species.

In the course of writing this text, I rang one or two companies just to check if they could offer *Riccia*. One, John Chalmers of Hobby Fish Farm at Milton Keynes had, by chance, just obtained several bags from a customer and should have some left for interested purchasers.

## DIFFICULT MADAGASCANS

Madagascan Aponogonets are particularly difficult to store during their resting phase due to the fact that their tubers shrivel during the growing period and do not store away nutrient for the next growing cycle.

In Madagascar, these plants grow in still water and in rivers which never dry out. The bedrock can be hard, but sometimes is composed of limestone, which obviously would greatly influence the chemical and electrical properties of the water which flows over it. Plants grow in sunny and shady areas and even in the mountains, some species occur as high as 1,800 metres above sea level.

I myself have found that several species will be dormant in an aquarium and then regrow as long as 18 months later. Sometimes, as in the case of *Aponogon crispus* and *Nymphaea 'Thai Lotus'*, they often grow back stronger than before. Others, such as *A. australis*, produce only weak sprouted tubers.



The Madagascan Lace Plant — not an easy plant to rest.

## Resting plants

I often get letters from readers wanting to know how to rest various plants during the winter months, especially with regard to the rhizomes and tubers of tropical aquarium plants.

Aponogonets, Nymphaeas, Barclayas and Crinums are



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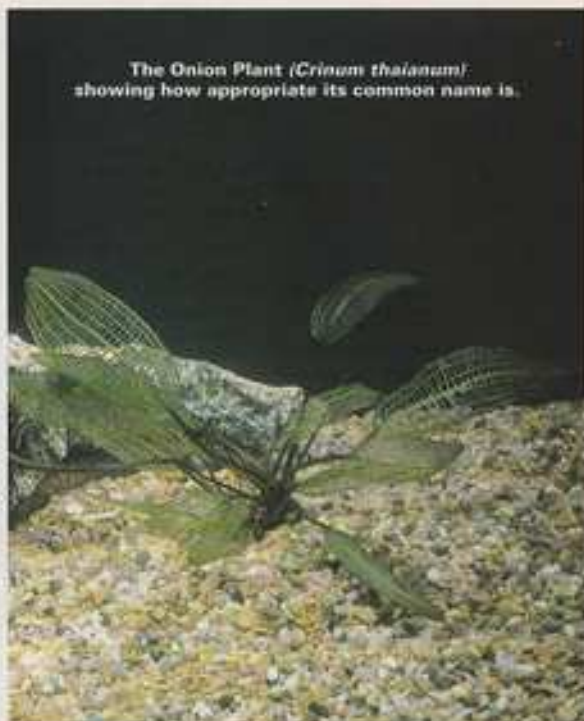
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The Onion Plant (*Crinum thalictroides*) showing how appropriate its common name is.



examples of plants producing these inflated storage tissues. Some of these species colonise flooded areas or marshes. The majority, however, grow in rivers and streams which permanently or periodically contain water, or in lakes and large ponds.

The fact that these plants produce tubers, rhizomes or bulbs and sometimes transitional forms of these, indicates their ability to pass through resting periods. Probably, these resting forms may not be a quirk of that plant's physiology, but more a response to a changing environment.

In the case of *Crinums*, it may be that in the distant past, they developed their bulbs as an evolutionary response to drought when they grew terrestrially like the majority of the rest of the genus, but continued the practice even when they adopted virtually permanent bodies of water as their new home.

Indeed, certain tropical water lilies when removed from their native, drought-prone environment in, say, Africa, to Singapore, where they are grown in permanently filled ponds, will not produce tubers at all.

Sometimes, the dormancy results from a seasonal drop in water temperature, rather than drought, and in these cases, the plant may simply shed the larger leaves and pass through the stress period by producing smaller leaves.

Specimens collected in the wild often show a tendency to produce forked and branched tubers. The same species will, however, sel-

dom, if ever, produce them under aquarium conditions.

These types can therefore only be propagated from seed. One or two species such as *Aponogeton stachyocarpus* and *Nymphaea dauberyana* produce adventitious plants from either flower stems or leaves.

## TUBER STORAGE

In general, the best way to store tubers is to remove them from the aquarium at the end of their growing cycle, strip them of dead foliage and wash them thoroughly. Then, dust them with fungicidal powder and bury them in a container of damp sand.

Ice cream cartons are ideal for the purpose, as the plastic lid is easily punctured to allow some ventilation. Keep the boxes at room temperature, and leave the tubers dormant for about three months.

At the end of this time, wash them well to remove the fungicide and replant them in the aquarium.

During the growing season, feed them with liquid fertilizer tablets, placing one tablet underneath the bulb at planting time, plus regular daily feeds of trace element solution.



# COLDWATER JOTTINGS

BY  
STEPHEN J. SMITH



## TEN YEARS ON . . .

I was ten years ago last month that Stephen Smith made his debut as A & P's regular 'Coldwater Jotter'. Now Stephen celebrates his achievement by looking back upon the last decade with a small selection of personal highlights from his popular column.

It was early January 1985 when A & P's then consultant editor John Dawes telephoned me to invite me to produce a regular monthly column for the magazine. I was delighted to follow in the footsteps of the column's previous author, Frank Orme, a great friend and mentor — but with one condition — that we retained Frank's title, **Coldwater Jottings**.

Since then, I have 'jotted' some 150,000 words about the coldwater scene, covering just about every subject imaginable within the coldwater hobby. The column has provided, and will continue to provide, a forum for some lively

debate, and has included interesting experiences from hobbyists throughout the UK and further afield; it has also had some influence on the development of the hobby in this country, while continuing to provide support to coldwater societies, retailers and manufacturers. And this does not include the countless letters from the column's most valued readers (many of whom have become great friends of this Jotter), or the introduction of new columns within 'Jottings', such as **Tail-piece**, . . . and **Finally Soapbox**, and **Photo-Jotting**.

And who can forget the famous 'Bluhaku' story which 'April Fooled' the fishkeeping scene right around the world?

So let's pick out some of the highlights of these first ten years, starting with the very first 'Jotting' in the February 1985 issue of *Aquarist & Pondkeeper* and a statement of philosophy to set the scene for the development of the column (this was, effectively, the column's first **Soapbox**).

## No rules of enjoyment

The hobby of fishkeeping is, apparently, the third most popular hobby in the world. As in all hobbies, there is often a conflict of opinion, none more so than in coldwater fishkeeping. Often, a method or principle which one fishkeeper holds dear will cause another to hold up his or her hands in horror, and this should be a healthy sign. My comment is this: fishkeeping is a matter of enjoyment — your enjoyment. The best method is to use the one that suits you, works for you, and with which you are happy.

Of course, the only way to learn and improve is by listening to the other person's point of view. You may well find the very solution to a problem you've been grappling with for ages. But remember, there are no hard-and-fast rules in fishkeeping, and it would be a pity if the enjoyment of the hobby should be spoiled by unbending opinion and bickering. There is so much about the pleasurable pursuit of fishkeeping that is rewarding: both privately and in the company of fellow enthusiasts.

(February 1985)

## Colour enhancer — with a difference!

With the ever-increasing number of proprietary medicaments available to assist the fishkeeper with his/her hobby, it is hardly surprising that someone has come up with the idea of a colour-enhancing food which will enable you to enjoy show-quality Koi — to your own design.

Ever fancied a blue-and-white version of a Kohaku, or a Matsuba Ogon which has every scale edged with red? Well, according to Scandinavian manufacturers of **Color Skope** pellets, anything is possible.

Containing all the constituent proteins for a balanced diet, **Color Skope** is a floating pellet with a difference which is likely to turn the Koi keeping world upside down.

Each tub (the pellets are available in 250 and 500 gramme packs) is accompanied with what the manufacturers call a 'pellet palette' comprising apparently

harmless hormones which trigger the colouring process of the Koi at individual targeted areas of the fish, such as: complete scales, scale edges, finnage, or lips.

The only drawback is that Koi need to be kept in individual ponds or aquariums, otherwise the wrong fish would be susceptible to the change. A detailed scientific explanation of the process is enclosed with suggested patterns, as well as colour photographs of treated Koi. In addition, the manufacturers inform me that a variation for Goldfish is scheduled to be released this summer.

Further information on **Color Skope** pellets is available from the manufacturers, **Olof Prall A/S**, in Denmark, via **Coldwater Jottings**. (Also included within the package is a large pinch of salt, so now check the cover-date of the issue of A & P in which this item appeared and write to: Stephen! — Ed.) (April 1991)



JOHN DAWES

The now-famous 'Bluhaku' caused quite a scare, plus several international phone calls! when it appeared in our April '91 issue. Here it is again, alongside the original Kohaku picture from which we created it.

## Fingers and thumbs

Talking of aquatic retailers, I spent a few hours on the other side of the counter recently, helping at an aquatic centre one Sunday afternoon. And what an experience! Hundreds of fishkeepers

## PHOTO JOTTING



### Disappearing Pandas

Whatever happened to the Pandas? This attractive New variety of Panda Goldfish from the coldwater scene by name last a couple of years ago. However, apart from its price,

since at the occasional 'show' of these, it seems to have disappeared. Are they being out-competitively bred? — I Perhaps you could drop us a line at **Coldwater Jottings**. (December 1985)









KEEPING AND BREEDING:

# THE CHAMELEON FISH

Peter Capon re-introduces this variable and beautiful relative of the Leaf-fishes.



MIKE SANCHEZ

Two specimens from the same batch. Note the differing patterns.

The Chameleon Fish (*Badis badis*) was first introduced to the hobby by H. Stueve of Hamburg in 1904. It has been sporadically available to the aquarist ever since, but has never achieved universal popularity. It is not boisterous like the barbs, nor always on the go like the danios, but a retiring beauty that shuns the game of tag that appears to be the norm in many community heavily planted tank where it will quietly mind its own business and grow into one of the more spectacularly coloured fish available.

## Variable fish

The colours exhibited by *Badis badis* have led some authorities to give the species the common name of Chameleon Fish, as they can change with mood, age and conditions, so a description is difficult. Young fish, as seen in dealers' tanks, usually exhibit uninteresting colours of yellow to clay brown, with six to ten transverse darker bars; not the kind of coloration to make them a fast-moving line for the dealer!

The adult males, however, are a different matter. The literature describes them as a fish whose body colour can range from light pink to red, and even purple to dark brown, with darker bars. The indi-

vidual scales can be green, red, yellow or even lacquer-black. The lateral line can be picked out in red scales with golden edges.

The fins can be yellowish green to dark blue. The dorsal often has red or green longitudinal stripes and is anteriorly edged in rose pink. The great difficulty in describing this fish's coloration lies in its ability to change colours and patterns at will, depending on the surroundings and the individual fish's mood.

The colours and patterns of the female are similar to the uninteresting garb of the juvenile fish.

The foregoing is a compilation of the descriptions from a number of literary sources. When I last kept these fishes, I didn't experience the same degree of variability or rapid change of colour that many authorities lead us to expect.

My males were generally jet-black, with a brilliant blue overlay to the body and yellow and blue to the dorsal. The females were generally brown or pale clay colour, with (often) a darker barred pattern.

## Unique feature

The main difference between the sexes is that the male has a concave belly, looking as though it has been poorly fed, whereas the female has a full-looking convex belly. The male also has a consider-

ably more highly developed dorsal fin.

The maximum size is about 8cm (c3.2in). The body is slightly compressed and, in general appearance, could be at first mistaken for that of a cichlid. However, although it is normally classified as a member of the Nandidae (the Leaf-fishes), *Badis* has a relatively small mouth and not the cavernous trap for the unwary that the other members of the family possess.

This feature has led to *Badis* being afforded its own subfamily (the Badinae), with *B. badis* being the only representative species — although two further subspecies are generally accepted: *B.b. siamensis* and *B.b. burmanicus*.

## Basic needs

Male Chameleon Fish tend to be territorial, so it is a good idea to furnish their aquarium with flower pots or rock caves to give each male a focus for his territory. Indeed, if several *Badis* are kept in the same tank, they are best kept in heavily planted community tanks containing only one to four *Badis* at a maximum. If they are given a species tank, even though ample plants and rock caves are supplied, without the distraction of other, more active, species, rival males will fight, with resulting injury.



Basically, *Badis* are carnivorous and can be difficult to feed, unless they can be supplied with live food. They will need coaxing and tempting to take just sufficient flake and freeze-dried foods to sustain life, and they will not join in the twice daily scrum of feeding along with the usual community fish. It is a good idea to watch the fish carefully so as to discover their favourite hiding places and, while the rest of the tank is rushing to grab every morsel of food, drop a few choice tid-bits down to the *Badis* so that they can enjoy a meal in peace.

## Breeding

Not having bred this species successfully myself, I can only rely on the records of successful breeders for the conditions required. The pH is recorded as between 6.8 and 7.2. The only mention of suitable hardness values is between 7 and 8 DH, so it would appear that specially softened water is not necessary, unless your local supply is particularly hard.

Adult fish are quite happy at 72° (22°C) but for breeding, 78 to 80°F (25.5-26.5°C) is more appropriate. The adults should be well conditioned, but any aquarist worth his or her salt will maintain all fishes in optimum condition at all times.

A reasonably sized tank, say 24 inches or 18 inches (60 or 45cm), is needed. This should be well planted, furnished with ample hiding places and a cave of rock or, preferably, a terra cotta flowerpot with the drainage hole widened to allow the fish to swim through. In the wild, spawning takes place in natural caves or hollows in the banks of slow-moving streams or static waters.

The male will normally take over the flowerpot and clean the inside of all debris and algae. As spawning time approaches, his colours will get darker while those of the female will get lighter.

The male will guard the flowerpot with much posturing and fin stretching whenever the female approaches. For a few days she will be driven off, but eventually, she will be allowed into the pot. The female then positions herself with her head close to her mate's caudal peduncle, whereupon the male curves his body around her in an embrace and eggs are ejected.

The eggs are adhesive and stick to whatever part of the flowerpot they first come into contact with; in most cases, this results in their being deposited on the roof of the pot. *Badis* do not deliberately lay their eggs in a predetermined position as do many of the cichlids; our subjects' eggs adhere wherever they touch first. An individual spawning can go on for up to 3 hours.

## Egg and fry care

Most authorities suggest that the female should be removed once spawning is over. An average spawning is usually in the region of 100 eggs.

The male can be left with the eggs, which he will guard and fan in a cichlid-like manner. At 80°F (26.5°C) it takes between 2 and 3 days for the eggs to hatch, with the fry becoming free-

swimming on the fifth day, at which time it is probably safer to remove the father.

The normal feeding routine of infusoria, brine shrimp nauplii, micro-worms, etc then follows. The exact times to start changing from one food to the next can only be left to the aquarist's own judgment as the fry grow, since it will depend on their rate of growth which will, in turn, depend on the amounts eaten and the quality of the aquarium water as regards to pollution by waste.

The fry are reputed to be delicate, but I cannot confirm or deny this from any personal experience. When the males start to sex out, they can become quarrelsome and will need to be spread out to further aquaria, but in reality, this will have had to be done before this stage, as 100 fry at, say, even just a quarter of an inch in length, will be rather overcrowded in a 24-inch tank.

The Chameleon Fish is an interesting subject for the community aquarium and, provided only one male is kept per tank, a relatively peaceful species. It is unfortunate that the fish usually seen in the dealers' tanks are only juveniles, because their dull, uninteresting colours give no hint of the beauty that comes with adulthood. As a result, most aquarists pass them over in favour of the more gaudy species.

BELOW - A magnificent male.



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### BADIS FACT FILE

- 1 *Badis badis* is classified as belonging to the Herichthyidae family, but by outward appearances, it doesn't appear to bear any resemblance to any of the other members of the family.
- 2 There have been a number of suggestions which involve erecting a separate family, the Badidae, to accommodate *Badis* from the Herichthyidae.
- 3 There has also been an alternative suggestion that the Herichthyidae should be split into three: Badidae, Herichthyidae and Phallopteroideae.
- 4 Yet another authority, Nelson, says that the family Herichthyidae should exist, but be divided into subfamilies — Herichthyinae, Phallopteroideae and Badidae, the Herichthyinae to be further sub-divided into two tribes — Herichthyini and Phallopteroideini.
- 5 In addition to the common *Badis badis*, there are also two subspecies: *Badis badis sumatrensis* from the Lake, Burma, and *Badis badis sumatrensis* from Phuket Island. If *Badis sumatrensis* has been impacted occasionally, but as far as I can determine, *B. badis sumatrensis* has not yet entered the hobby.

## FASCINATING FISH FACTS

### Bloodsucking cat

One particular species of South American Parasitic Catfish, the *Cannero* or *Candiru* (*Vandellia cirrhosa*), feeds on blood. It usually finds its food by using the current of water produced by a potential victim's (another fish) gill plates as they flap open and shut. The *Cannero* swims 'up-current' and, at the precise moment, dives into the gill chamber, sticks themselves to the gills, rips away and drinks the blood that oozes out of the wound.

Now, any strength, 'narrow' current will elicit this response — not just respiratory ones — as many unfortunate visitors to *Candiru* country have found to their cost when they've 'spiced a penny' in an 'infested' river.

Apparently, it is possible to prepare a poison from certain tropical fruits that will cause the embarrassingly attached, pencil-like catfishes to release their grip. The bad news is that, even if you know what fruit to look for, and even if you eventually find it, and prepare the poison, several hours will have to elapse before you 'poor' the catfish!

Having learned this painful lesson through bitter experience, the men of certain tribes bordering *Cannero*-infested waters wear special protective penis sheaths. Interestingly, there don't appear to be equivalent protective devices for women... which says a lot for the chauvinistic outlook of the men of such tribes.



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Preserved specimen of a *Candiru*. The pointed, pencil-like body form is ideally suited to its voracious way of life.



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15ft x 10ft	£28.50	£22.50	£13.50	28ft x 15ft	£74.10	£38.50	£25.10
15ft x 12ft	£34.20	£27.00	£16.20	28ft x 18ft	£98.82	£70.20	£42.12
16ft x 10ft	£30.60	£24.00	£14.40	28ft x 20ft	£98.80	£78.00	£48.80
16ft x 12ft	£36.48	£28.80	£17.28	28ft x 24ft	£118.56	£93.60	£56.16
16ft x 16ft	£46.64	£36.40	£23.04	28ft x 28ft	£158.40	£94.00	£70.40
18ft x 12ft	£41.04	£33.40	£19.64	28ft x 34ft	£127.68	£100.80	£50.48
18ft x 15ft	£51.30	£40.50	£24.30	30ft x 18ft	£102.60	£81.00	£48.60
18ft x 18ft	£51.54	£48.60	£29.16	30ft x 20ft	£114.00	£90.00	£54.00
20ft x 15ft	£45.80	£36.00	£21.60	30ft x 22ft	£125.40	£99.00	£59.40
20ft x 18ft	£57.00	£48.00	£27.00	30ft x 24ft	£136.80	£108.00	£64.80
20ft x 18ft	£58.40	£45.00	£27.00	34ft x 34ft	£155.04	£122.40	£73.44
20ft x 20ft	£76.00	£60.00	£36.00	40ft x 30ft	£228.00	£180.00	£108.00
21ft x 15ft	£38.86	£47.25	£28.36	50ft x 40ft	£380.00	£300.00	£180.00
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87500	£	87500	£	3600
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87500	£	87500	£	4000
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87500	£	87500	£	4600
87500	£	87500	£	4800
87500	£	87500	£	5000
87500	£	87500	£	5200
87500	£	87500	£	5400
87500	£	87500	£	5600
87500	£	87500	£	5800
87500	£	87500	£	6000
87500	£	87500	£	6200
87500	£	87500	£	6400
87500	£	87500	£	6600
87500	£	87500	£	6800
87500	£	87500	£	7000
87500	£	87500	£	7200
87500	£	87500	£	7400
87500	£	87500	£	7600
87500	£	87500	£	7800
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# THE SHOW MUST GO ON

A&P editor John Dawes assesses the present state of play and offers some thoughts for the future of aquatic shows.

**N**o sooner have we tidied up all the loose ends following a hectic show season, than we are already rearing up for another... and looking forward to it. We always begin every season full of hope and energy, and end up exhausted, with some great experiences under our belt, some expectations having been met and some alarm bells ringing in our head. I wonder what the 1995 season holds in store.

Whether a show has been successful or otherwise, the period between the last staging and the next is, or should always be, one of reflection and planning. This is also a potentially dangerous time in the sense that if these reflections are delayed for too long, then shortcomings can begin to appear 'less short' and highlights can begin to adopt even 'higher lights' than they originally possessed. In other words, complacency sets in and time begins to take some of the sharp edges off our memories. Then, before we know it, we are back where we started, running out of time yet again, and ending up with a virtual carbon copy of the previous year's event, with several improvements worked in.

## Major concern

It is this carbon copy factor that worries me, probably more than anything else. Take the following example.

As we all know, attendances at major indoor shows are well down on what they were, say, 10-15 years ago. Remember Belle Vue? Remember how you couldn't move because of the thousands of people that packed the hall on both days of the event? Of course, you do! Once there... never forgotten.

But, do we really want Belle Vue back? My own personal feeling is that we certainly want the crowds back, but not a show that's now at least a decade out of date. The Belle Vue festivals were great at the time (even though the venue wasn't) but things have moved on... or have they?

Having visited every single major indoor non-Koi show for the past umpteen years, as well as many Koi ones, I can't, with hand on heart, say that every one of them has moved with the times. And I'm not alone in thinking like this. I've received a brainful of moans and complaints from show visitors concerning precisely this point. (Interestingly, relatively few complaints relate to Koi shows). What makes



the complaints all the more worrying is that they come from, both veterans of the show circuit, as well as first-time visitors.

## First-time moans

The most often quoted reason given by those first-time visitors who vow never to return (and there are far too many of these) is that, apart from the trade stands, there isn't a great deal for beginners at some of the shows. This is a somewhat extreme criticism, I know, but there's at least a grain of truth in it. Where are the ideas for aquarium set-ups suitable for living rooms? Where are the demonstrations for beginners? Where are the displays of furnished tanks? Where can you sit down for a chat? Why are the catering facilities so poor? These are not my questions, but those that I get asked over and over again on the A&P stand every year.

It is to the credit of the dedicated show organisers that they put on a show at all, particularly in the face of extremely difficult economic challenges. It is also to the credit of these same organisers that attempts are made to tackle all the above issues. But is the pace of change fast enough? The answer is probably no.

## Trade concerns

Over recent years, many trade exhibitors at indoor shows have done rather badly in terms of sales. They pay for their stands, for transport, for staff accommodation, etc., so their show weekend bill is a pretty hefty one. When this is not matched by an adequate return on sales, doubts regarding their attendance at future events are inevitably raised.

What these exhibitors generally tell me is that they need new aquarists to make their attendance worthwhile. That's where their main potential to generate fresh large-scale sales lies. We, the old hands, don't really spend a great deal of money at shows... at least, not enough of us spend enough money to keep the tills ringing.

So, if the trade requires new blood... and that new blood is not coming in through the turnstiles... what's going to happen? No traders... no shows!



At some shows last season, several trade exhibitors spoke to me about the dire need for someone to take a fresh look at the design and content of fish shows, before it's too late. They all badly want to support the hobby, and none wish any show to go under. But... and it is a very important but... they can see the time, in the not-too-distant future, when this could happen, unless something is done... and now!

## Need for a change

The veterans will keep coming back... we always do... no matter what sort of show is on offer. But, crucially, we don't bring new blood into the hobby, however many shows we may attend. Yet, new blood is precisely what we are in desperate need of. Without this, we stand a snowball's chance in hell of raising attendance figures, and the consequences of such failure don't bear thinking about.

To be quite blunt, unless we wake up to the harsh realities of today's world, and unless we have the courage to tackle the challenges head-on, we could well be looking at the extinction of the major traditional indoor shows as enjoyable, educational spectacles within the next few years. How I hope I'm proved wrong!

Please, whatever you do, don't misunderstand me. I have always been, and continue to be, in awe of the people who, year in, year out, pour blood, sweat and tears (sometimes literally) into staging the shows which we attend. These dedicated teams of unpaid volunteers require and deserve all the support and admiration we can muster, and I, for one, desperately want them to succeed. But all the support and admiration in the world can't, alone,



# O ON... BUT WILL IT?



- 1 This attractive aquescap, photographed at last year's Yorkshire Aquarists' Festival, is the sort of display that appeals to first-time visitors.
- 2 The major festivals all display some of the very best fish in the country (this excellent Suckermouth Catfish was an entry in the 1994 Champion of Champions competition). Do we exhibit such fish to optimum effect?
- 3 A winning tableau with relevance; a fish house contributed by members of Darwin AS for several shows.
- 4 Societies were present in considerable numbers at the European Aquatic Festival held in Dunstable last June.
- 5 Some societies, like the West Yorkshire Marine Aquarists Group — seen here at the Yorkshire Aquatic Festival — put up eye-catching stands that attract a constant stream of visitors.
- 6 The BKKS 'National' — the top Koi show in the country — keeps getting better every year.

guarantee the long-term survival of traditional shows if these don't pull in the crowds, and this is something that we are clearly failing to do in the numbers that we need to, some Koi shows excepted.

Despite all the concerns that are voiced in public and in private, everyone agrees that there is hope. Some refer to shows of

the type that were run some years ago at Kempton Park and Sandown Park. Backed by Aquarian, in collaboration with the Association of Aquarists, these shows were deemed to look 'polished' and up-market. It was also generally felt that they attracted a high percentage of new aquarists and pondkeepers.

## TEN THOUGHTS THAT MIGHT HELP GET THINGS MOVING

### 1 Tableaux

Is it time for a change? Should today's tableaux be more in line with aquatic themes... or be more relevant to the hobby... or carry a message? Should they, perhaps, incorporate ideas for beginners? Should they be dropped altogether?

### 2 Fish Competitions

Should these be housed in the same room as the main show? Should they consist of single fish (or pairs) in bare tanks? Or should they be re-designed so that they hold a wider appeal for the general public?

### 3 Furnished Aquaria

Should these take over from the single-fish traditional type of competition at major festivals? Would themes that mean more to the general visitor, e.g. community aquaria, Amazonian tanks, African Rift Lake communities, Discus tanks... or whatever... replace the more traditional bare-tank competition? Should this replacement be partial or complete?

### 4 Activities

Shouldn't there be more 'fun'-type activities, e.g. like the aquarium race held at Weston? Or how about frequent demonstrations of how to set up aquaria and/or ponds? Shouldn't children's entertainment be a requisite of every show?

### 5 School Parties

Would it be a good idea to send out free invitations to all schools in the area, thus encouraging school parties to attend? And, if they do attend, how about organising special talks/activities for them?

### 6 Show Discounts

Bearing in mind that festivals last for just one weekend, but that local retailers have to survive throughout the year, should show discounts be controlled in such a way that they don't hammer the local shops who need all the support we can give them? There is no suggestion here of doing away with all types of show offers, of course, as these have great pulling power. It has, however, been said about some shows, that they are becoming like Car Boot Sales. Nothing wrong with Car Boot Sales, but is this the image we want to project?

### 7 Advertising

Radio and TV advertising can work wonders... but not if the adverts are transmitted at the wrong time of day, e.g. mid-morning, when everyone's at work. This has been known to happen and has proved a very expensive mistake.

### 8 Overall Appearance

Should we stick to the present type of stand designs where everyone does their own thing, or should there be more upmarket standard shell schemes within which each exhibitor can then devise their own creations?

### 9 Aquatic Societies

General and specialist societies can generate tremendous interest among beginners. Every effort, including financial assistance with show expenses, plus free stand space, should therefore be made to encourage them to attend. This is already done to an extent, but further thought could lead to a more attractive package for societies. Housing them close to each other (such as was the case at Dunstable last year) would seem a good idea. Prizes could, perhaps, also be awarded for the best three society stands.

### 10 Trade Involvement

Should an approach be made by the various federations and associations to the aquatic industry to get them more involved in the planning, designing and financing (sponsoring) of the shows? This, of course, already happens to a considerable extent, but the potential of this source of assistance seems not to have been explored as creatively as it could be.



time for people to sit and chat... and the 'traditional' fish competition is located away from the main show area (this is a separate issue altogether, worthy of an article in its own right).

Then, there is the open air, marquee-encircled Hikari-sponsored Koi National run by the British Koi Keepers' Society, which still seems to be getting better and better with each passing year and presents visitors of all levels of expertise with a superb spectacle of the very best in Koi and Koi keeping.

The truth is that every show has something going for it. All the positives must therefore (of course) be retained and improved.

However, the time has come, in many people's view, when some very difficult, harsh commercial decisions must be considered. These may well take the staging and running of some of our most important and best loved shows into the realms of hard-nosed professionalism and away from where our major strengths lie, but if this is what it takes to ensure that our shows do not just struggle to survive from one year to the next, but actually thrive, can these decisions be delayed any longer? We have, after all, already lost one of the friendliest shows around — the much-loved Scottish Aquarist Festival — and that's one loss too many.

As an ardent fan of good shows and an equally ardent admirer of all the countless people who make these events possible, my sincerest hope is that 1995 will see the challenges being attacked with vigour and



DANIEL KEEFER PHOTO

**"Fun" activities like the Aquarium Race which took place at the Supreme Festival of Fishkeeping in November, are great plusses which must be encouraged. This is the trade race with the Interpet team in the foreground, the Hagen team behind them and — just in shot — the Aquarian team.**

resolution. I know that many show organisers, themselves, want to forge ahead with all speed. I also know that these forward-looking devotees of our hobby have a major battle on their hands, and regularly meet with resistance, rather than whole-hearted support.

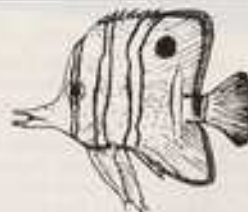
To the resistors, I would say that, if that

resistance is too entrenched in the past and too prolonged, there may soon well be nothing left to resist! At one of last year's shows, a lifelong supporter of these events said to me, with genuine sadness in his voice: "John, we are in danger of becoming dinosaurs." Well, we all know what happened to them.

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# SOCIETY WORLD

## FBAS NEWS

### 1 New chairman

Peter Furze has been elected as chairman of the Federation of British Aquatic Societies (FBAS) for 1995/96. Peter is a member of Hounslow AS and is the editor of Fishworld magazine, as well as the FBAS exhibition manager. Peter takes over from Joe Nethersell, who stepped down after a record-breaking eight years as FBAS chairman.

### 2 Show stand officers

Newly-elected show stand officer for 1995/96 is Roger Crew, of Isle of Wight AS. Societies are invited to book the show stand for their Open Shows, by writing to Roger if they are in the south of England, at 28 The Mall, Binstead, Isle of Wight PO33 3SF. Societies in Wales and the west of England should contact Geoff Blackburn, 28 King Street, Pant, Dowlais, Merthyr Tydfil, Mid-Glamorgan, Wales, while, for the north-east of England, the contact is Derek Bailey, 5 Canon Grove, Jarrow, Tyne and Wear.

### 3 Hagen sponsorship

Rolf C Hagen will continue its sponsorship of FBAS throughout 1995 with powerheads for the first 100 societies to affiliate to the FBAS. These are sent automatically by the FBAS treasurer when societies enrol. Details of membership are available from Adrian Dempsey, 194 Greenhill Road, Greenhill, Herne Bay, Kent CT6 7RS. Additionally, Hagen Show Packs and Nutrafin sweat-shirts are available for Best in Show award winners.

### 4 Interpet Champion trophies

Interpet will continue to sponsor the 1995 Championship Trophy classes and Best-in-Show awards at FBAS-supported

shows. Details of all show support awards from Alan Henderson, 5 The Nook, Corby, Northants.

### 5 Supreme Festival News

The Supreme Festival of Fishkeeping will, once more, be held at Pontin's in Weston-super-Mare this year. The dates are 4-5 November. Fuller details will appear in A & P as we receive them.

## A of A NEWS

### 1 Caravanning weekend

Bookings are still available for a caravanning weekend organised by the Association of Aquarists (A of A). The weekend

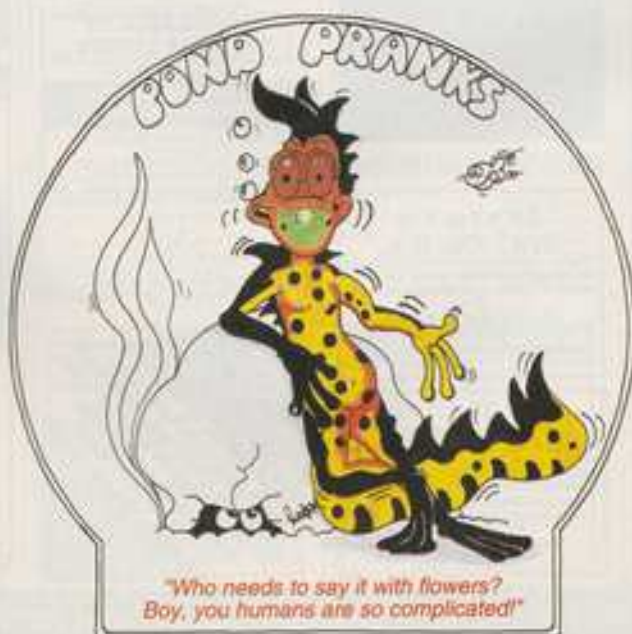
takes place for four nights from Thursday 9 March to Monday 13 March, at Sandy Bay Holiday Park, North Seaton, Northumberland (Tel: 01670 815055).

Cost is only £40 for a six-berth caravan, and the site has an indoor heated swimming pool, lounge and bar. Details and booking form from: Judith Aylmer, A of A Secretary, 5 Napoleon Drive, Basingstoke, Hants RG23 8DW. Tel: 01256 53793.

### 2 N/S Convention

The third North-South Convention of the A of A will be held at Amersham Community Centre, Amersham, Bucks, on Sunday 9 April. The convention is organised in conjunction with the Federation of Northern Aquarium Societies (FNAS) and tickets are available to members at £5 (non-members £6), plus only £3 for tickets for a two-course meal.

Doors open at 10 am with the first of three speakers, FNAS chairman Brian Walsh presenting a talk. Looking at fish a different way at 11 am. An auction, open only to ticket holders, is at 12 noon, and at 2.30 pm Derek Lambert presents a talk. Collecting livebearers in Guyana, followed at 4 pm by Dr T Gill from the Natural History Museum, speaking on Marine fish new to science. The day is expected to end at around 5.30 pm and tickets are available by contacting Nigel Aylmer (Tel: 01908 318324), or Malcolm Goss (Tel: 01494 722788).



## March Diary Dates

**Sunday 5**  
**Association of Aquarists** — Spring Quarterly Meeting, Vernon Room, Queensway Halls, Dunstable, Beds (12 noon). Auction, 2 pm. Details: Don Sheat, Tel: 01582 505364, or Martin Kelly, Tel: 01582 668774.

**Burley-in-Wharfedale AS** — Open Show, Collingham Village Memorial Hall, Collingham, near Wetherby. Booking-in: 11.30 am; Auction: 1 pm. Details: Mrs J Thurbly, Secretary, Tel: 01943 852643.

**Dunstable and District AS** — Spring Quarterly Meeting, Queensway Hall, Dunstable, 12 noon. Quarterly Meeting, 1 pm. Lunch and booking-in: 2 pm. Auction. Details and information to pre-book lots: Don, Tel: 01582 505364, or Martin, Tel: 01582 668774.

**Tuesday 7**  
**Gloucestershire AS** — Meeting, Bell and Gavel, The Cattle Market, St Oswalds Road, Gloucester; video on Koi Pond Construction and a Q&A session by Clive Norris of Reflections Aquatic Consultancy. Details: Andy Ramsbotham, Tel: 01452 521600.

**Friday 16 and Sunday 12**  
**Yorkshire Cichlid Group** — Series of lectures from David Herlong, editor of the American Cichlid Association Journal. Buntingford. Subjects include: Collecting Cichlids in Peru (8 pm on Friday) and Collecting Cichlids in Honduras, plus Lake Malawi (1.30 pm on Sunday). Venue: St Anne's Church Hall, Wrenthorpe, Walsell Rd, Yorks. Tickets: £3. Contact: Andrew and Rosemary Ripley, 41 Bellevue Park, Gillingham, Nr Strough, Hants, Tel: 01430 441759.

**Saturday 18**  
**Kent Association of Aquarist Societies (KAAS)** — Annual Convention, Beulah Court Hotel, Cliftonville, Kent. Two guest speakers, heat of KAAS quiz-club quiz, raffle, fish auction, evening buffet. Details: Dave Goodwin, Tel: 01304 381781, or John Peil, Tel: 01634 369362.

**Sunday 19**  
**Birtley AS** — Open Show, Birtley Community Centre, Ravensworth Road, Birtley, FBAS Championship Trophy, Interpet Award. Batching from 11 am-1 pm; Auction: 12 noon. Details from Mike, Tel: 0191 410 5990.

**Monday 20**  
**Reigate & Redhill AS** — Bring and Buy Sale, Showroom Hall, Albert Road, Horley, Surrey. Doors open: 7.30 pm; Sale: 8 pm; Refreshments: 9.30 pm. Details: Jeremy Spence, 60 Ralley Road, Northgate, Crawley, West Sussex RH10 2BZ.

**Sunday 26**  
**British Cichlid Association** — Convention and auction, Dealing School, Paix Road, Deeping St James, near Peterborough. Speakers: Dr Keith Banister on West African Cichlids; Mike and Gina Sandford — photographs and talk on their experiences with cichlids. Start 11.30 am (Convention); 1 pm (Auction). Details: Alan Hill, Tel: 081 797 2311.

## April

**Tuesday 4**  
**Gloucestershire AS** — Meeting, Bell and Gavel, The Cattle Market, St Oswalds Road, Gloucester; Talk on Ariantbirds by Norman Bindings of the former Cheltenham Tropical Fish Society. Details: Andy Ramsbotham, Tel: 01452 521600.



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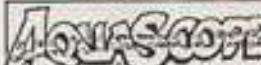
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# DISCUSSIONS

BY STEVE DUDLEY

## POPULAR DISCUS QUESTIONS

Although I get asked a very wide range of questions about Discus, some keep coming up time after time. I've therefore selected three of the most popular topics for this month's **Discussions**. I hope you find them both of interest and use.

### 1 How large do Discus grow?

Adult Discus can vary in size. Some fully grown specimens achieve some 8in (20cm) in size, others not more than 4in (10cm).

There are many factors to be taken into consideration when discussing size. For example, if your Discus are only 4in when fully grown, this may not just be down to how they have been reared. Nor is it down to the space provided for them to grow in. Small size can be inherited.

As we know, not every person on this planet, achieves a height of 6ft. Neither do we all grow at the same rate. Both the rate and amount are down to what genes we carry from the moment of conception. The same principle can be applied to Discus.

In order to grow large specimens, the need to have a family background of larger parents and grandparents is paramount.

Providing good rearing techniques are then supplied, all the fish will grow to a respectable size. Alternatively, broods that do not possess such a background may — even if given the best possible attention — only produce a handful of large fish.

So, it is really safe to say that only certain varieties that are of an appropriate genetic strain can produce those huge Discus that some people admire. Some of these which have been bred time after time are quite common among Brilliant Turquoise and Red Turquoise strains.

In time, most other varieties may follow suit, but this will only be possible through selective breeding and not just by throwing two fish together in the hope that they will produce giants.

There are lots of breeders around the world producing high-quality Discus with these inherent desired characteristics, but believe me, these fish are not cheap! They are all of pedigree stock and quite a lot of hard work will have gone into their creation in order to achieve such high standards.

### 2 At what age will Discus breed?

Some Discus mature more quickly than others, as early as nine months. In some cases, once a young female has come into spawning condition, it may

be impossible to deter her from breeding. If females spawn too early, though, this will adversely affect their growth. However, there is nothing you can do, other than make the most of it, if there

is a fertile male of appropriately good standard at hand.

If a male spawns early, this does not — as in the female — mean that his growth will be impaired. If anything, he will turn into a fine breeder that will have

## GOLDEN RULES

### 1 Adjusting pH

Check the pH of your water at the same time each day if very soft water is being used to keep Discus. Such water has a tendency to be unstable, especially since a healthy bacterial colony on the filter medium will always cause low pH readings (as low as pH4) if unchecked.

To bring this back to an acceptable level, either carry out a 25% water replacement and clean some of the filter medium, or add a little bi-carbonate of soda. In my experience, using bi-carb to produce a higher pH does not harm Discus.

Problems can occur, though, when the change is in the other direction, i.e. from high pH to low. This commonly happens when using too high a concentration of acidic substances like ortho-phosphoric acid. Such substances should only be used in make-up water and never added directly into the aquarium. If too much is added to make-up water, this can be easily rectified. It may prove impossible to correct mistakes if the acid is administered directly into the aquarium.

Bi-carb of soda can, however, be added directly, providing little is used between measurement checks, as this compound is not as potentially harmful as acidic substances.

### 2 Introducing new arrivals

When new fish have been purchased, they are normally transported in oxygen-filled bags, probably with two or three livings. The easiest way to acclimatise them to their new home is to place the bag containing the fish in a bucket and use an air line to transfer aquarium water (slowly) into the new bag. Let it overflow into the bucket.

After 15 minutes or so, the bucket will become full and, at that point, the bag of fish can be emptied into the air-illuminated aquarium. Transfer the water in the bucket back into the aquarium.

### 3 Lighting

I have always favoured a Grolux tube; I also like the new PowerGlo. Both are good for showing off the fishes' colours and both are good for plants grown in water up to 18in (36cm) in depth. Try to place the tube or tubes at the front of the aquarium for best results.

### 4 Thin fish

Such fish can be fed with a good white worm culture that has been fed (as a carrier of multi-vitamins) Ready-Brek and egg yolk mixed.

If the Discus have been treated for internal worms or flagellates etc, increase the temperature to 32°C (90°F) for four days and feed the culture for two weeks.

If all goes well, the fish will begin to gain weight and other foods may then be offered. Some fish may, of course, be past saving, as they may have not been diagnosed correctly ... or not at all.

Stress is the root of most diseases and can cause ailments that are often detected too late, unless you have a good knowledge of common problems associated with Discus.



Red Turquoise often grow into very large specimens.



Spawning can occur in fish as young as nine months!



had plenty of experience. Although some males are enthusiastic at an early age, they may not be able to fertilise a full clutch of eggs. Don't be disappointed, as such males will eventually do their bit!

### 3 How long do Discus live?

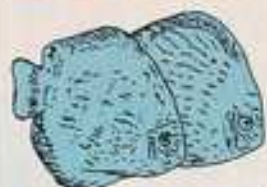
Discus can live as long as ten years. I once had two 'Solid' males which lived for 7 and 8 years, respectively, but they looked as old as they were. Both had heads that were 1/4 inch thick and were monsters.

The life-span of Discus also depends to a large extent on how well or otherwise they are kept.

### PRIZED DISCUS

Do you own a really old Discus which you treasure? Have you got a photo of it? If so, please send it in, along with details of the fish in question. We'll publish some of the best pics and details in Discussions. There will also be a special prize for the oldest UK Discus we can find. We can't unfortunately send prizes abroad... but we'd still love to track down the oldest Discus in Europe, or even the world!

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# KOI HEALTH

Following on from **Deadly Brew**, published in the December '94 issue of *A & P*, Barry Goodwin takes a further look at our tapwater and its potential effects on the wellbeing (or otherwise) of our Koi.

**P**robably the first Koi keeper to pin water quality problems down to tapwater contamination, and start a very big ball rolling by installing one of the first water purifiers, was *Aquarist & Pondkeeper's* regular **Koi Talk** columnist **Alan Rogers**. Alan's problem was aluminium sulphate contamination of his Koi pool water, as a result of which he lost a lot of very expensive fish.

Being the sort of person that he is, Alan never attempted to hide things, as many others would. Rather, he brought the incident to light so that other Koi keepers might benefit. The whole saga was very well documented in two articles that he wrote entitled **The Eve Of Destruction** and **The Eve Of Destruction<sup>2</sup>** for *Nishikigi International*.

It was around the same time that **Rachel Gosling**, another Koi keeper that the 'oldies' among us will remember, suffered similar problems and also installed a purifier, about which she wrote an article in the *BKKS Journal*.

## Worsening situation

Since those early days, water supplies have not improved. In fact, as many Koi keepers will testify, the problems that arise from filling our ponds with unpurified water are many and escalating as the years go by.

There was an incident, not so long ago, at Camelford, where aluminium sulphate was dumped at high concentration into the drinking water with, as yet, not fully documented effects. I wonder how many Koi keepers were affected by this incident.

There are countless reports of copper contamination having disastrous effects. I can, for example, bring to mind the problems at the famous Cheshire Home pond, built by the Norwich section of the BKKS, that **Keith Allan** of Norwich worked so tirelessly to pinpoint and rectify. In all cases, had it been possible to predict the problem, a water purifier of the correct type would have saved the day.

The greater strides that our industry makes, the more is the amount of toxic waste that has to be disposed of. This is done, in most cases, very safely and in accordance with rigid guidelines, but there are always 'cowboys' in the waste disposal industry who will bend or ignore the rules simply to turn a quick buck.

On Thursday 24 November 1994, *The Cook Report* on ITV screened an episode entitled **Muck and Money**. The programme dealt with pollution from illegally dumped toxic waste and its possible effects on our drinking water. The implications of this were very frightening to us as humans, who must necessarily drink the stuff, but Heaven alone knows what the worst ramifications for us as fishkeepers are.

Basically, the programme was about the disposal of toxic waste materials, and highlighted the scandalous disregard for the statutory regulations that some waste disposal companies have.

For some time now, the law has stated that all persons who dispose of trade waste, must possess a **Waste Transfer Licence** which is issued by the Local County Council. This is done after submitting an application where the type of waste that you propose to transport and dispose of is specified. The licence must be carried at all times when transporting waste, and be produced on demand. This not only applies to the big companies, of course; every local landscaper must have such a licence to dump your old fence after it has blown down, or even your conifer clippings.

The document must be shown at the tip when dumping, and the waste company must then issue a receipt detailing the type of rubbish that has been dumped. Fool-proof you might think!

For *The Cook Report*, a waste management company was set up under the name of **J R Cook** which attempted to dispose of waste that was labelled as highly toxic; in fact 'farm waste contaminated with paraquat'. No fewer than 14 visits were made to nine sites and, reportedly, only twice were they turned away. On the sites where the load was accepted their paperwork was apparently ignored and the receipts they were given were, it is claimed, falsified as certifying that only 'general rubbish/waste' had been dumped.

Of course, as the programme reported, the waste dumped by J R Cook was quite safe, but the site personnel did not know that. The conclusion they drew is that just anyone can dump anything... at some sites... whether or not the site is suitable... with seeming impunity, regardless of the laws that are now meant to control the disposal of toxic waste.



ASHLEY HODGKINS

This pond is owned by Nigel Caddock of *Nishikigi International*. Nigel is aware of the problems that unpurified water can bring and his system has total protection, courtesy of his 'Spark-L-Pure' micro-filtration unit. Ironically, Nigel's pool is situated not many miles from Risley.



GOSETTE WATKINS

All Koi, whether prize-winning specimens or otherwise, deserve 'prize-quality' water, so keepers must keep a watchful eye for any unwelcome 'surges' in the supply.



## THE ULTIMATE NIGHTMARE

This has far-reaching effects for all of us because, as was shown later in the programme, a major pollution disaster occurred at the Hepstone Landfill site at Peterborough. This was over the dumping of pesticides which had contaminated groundwater. A Cambridgeshire County Council spokeswoman estimated that it would cost tens of thousands of pounds to clean up. The National Rivers Authority were, in this case, left to 'carry the can' so to speak, as by a remarkable loophole, the contractor responsible had just handed in his licence and walked away.

One of the sites visited by J R Cook, which accepted their waste illegally, was an unlined site that was not suitable for the dumping of any toxic substances at all. The programme interviewed a professor from Bradford for an opinion, and he expressed horror that the possibility of paraquat being dumped on the site existed. This site sat on top of one of the major aquifers in the country, and leaching would undoubtedly take place, contaminating the aquifer with paraquat. This would then be extracted, along with drinking water from boreholes.

### Koi-keeping relevance

Drinking water, of course, means water for our fish, which would react rather unfavourably to a substance like paraquat!

I have long advocated the use of water purifiers to Koi keepers and, obviously, a good water purifier will still give you a degree of protection against such happenings. There is, however, a limit to what a purifier will extract before it, in some way, fails. It will extract herbicides or pesticides, for instance, when they are present in the water in expected, or slightly higher, levels, but there is a good chance that the unit could be overwhelmed by very high

levels of pollution, such as could be introduced by toxic waste.

This would depend upon the type of cartridges fitted. A PAC briquette, or microfilter, for example, would probably remove some or all of the contamination,

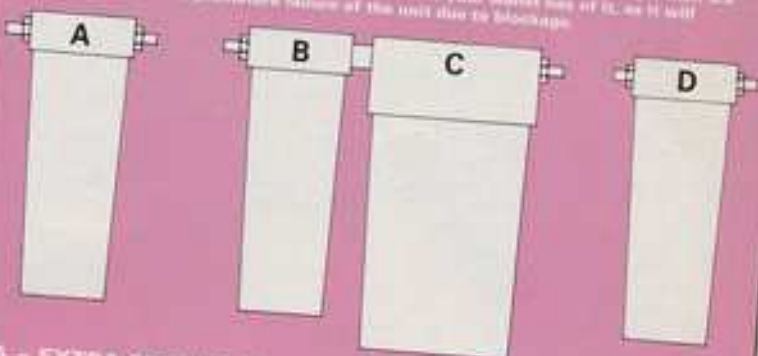
but by doing so, would probably block because of the small micron retention capability, which (of course) is the safest option. At least, though, you would keep the contaminant out of the pond.

Other cartridges that have, because of

## RECOMMENDED WATER PURIFICATION SYSTEM

A water purifier unit can be tailored to suit your requirements, dependent upon the area of the country where you live. Before this can be done successfully, you must first understand something of the nature of the cartridges that your particular purifier uses, you must also know a little about the quality of your particular tapwater supply. The unit considered here is of the type that uses the American 'Ametek' cartridges which are in common use throughout the country.

You must first of all look at your main purifier cartridge (C) specification and you will find that it probably has a particle retention capability of 0.5 microns. This means that any particles that come through your tap greater than 0.5 microns in diameter will be physically retained by the cartridge. This is obviously satisfactory from the point of view of the safety of the unit, as quite a lot of undesirable elements in the water are larger than 0.5 microns. It is, however, unsatisfactory from the view your water has of 0.5 or 0.4 will undoubtedly cause the premature failure of the unit due to blockage.



A = EXTRA PREFILTER  
B = PREFILTER

C = PURIFICATION CARTRIDGE  
D = METALS UNIT

It is necessary therefore to fit a pre-filter cartridge (B) to protect the main cartridge, and this must necessarily also have a particle retention capability of 0.5 microns. Most purifiers have this already set up by the manufacturer. This improves the situation somewhat, as although this pre-filter cartridge will also eventually block, it can be quite cheaply replaced and protects the main cartridge, allowing it to get on with its work unimpeded by sediment.

Certain areas of the country we know have high sedimentation from polluting material that is intermittent in appearance and does not always show on the water quality reports because of this. Here, it is possible to block a pre-filter cartridge overnight when a 'large' rating which can be disposable or reusable as the need dictates.

Disposable elements are available in seven ratings, of 0.5, 1, 2, 5, 10, 20, and 50 microns. Washable cartridges come in similar ratings, except the 0.5 micron size. If you need to remove specific waste, then it is only necessary to fit an extra cylindrical cartridge that has specific retention capability (D) at the end of your system. In this case, you have the pre-filter set-up with the main cartridge protecting it, the only maintenance necessary should be either to wash or replace your first pre-filter element, replace the second pre-filter cartridge at intervals and replace the main cartridge when they are exhausted.



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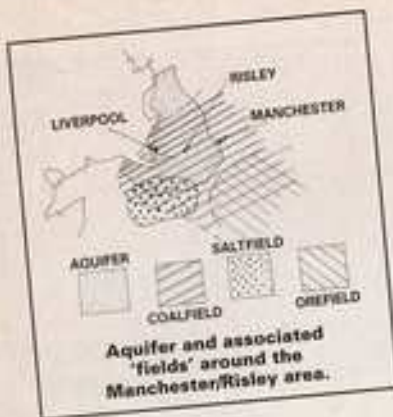
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their nature, a high voidage, would need to be extremely well protected by pre-filter stages to prevent pollution getting through after the carbon had been chemically overwhelmed, as they tend not to block. This indicates that the case for sophisticated pre-filtering techniques is a strong one indeed.

## Buried time-bomb

It is not only substances like paraquat that could get into the aquifers by careless disposal. The ITV programme also indicated that on a landfill site at Risley in Cheshire, there is a whole tanker of toxic waste buried 30 feet down.

It seems that this was done furtively on a Sunday afternoon when there was no one around to witness it. Nobody knows just what that tanker contains, and efforts are being made to locate it and correctly dispose of it - if it is not too late, that is.

Referring back to my last article on aquifer pollution, **Deadly Brew** (A & P, December 1994), it would seem that the leaking abandoned coal mines are not the only culprits we must regard.

## Catering for 'surprises'

Your water company will send you a Drinking Water Quality Report on application, and this is a good, honest guide to what you can expect to find coming through your tap.

It is, however, common knowledge among Koikeepers that many cases of pollution come as 'surges' and affect the

water for short periods of time only. This is what happened in the aforementioned case affecting Alan Rogers, and it just happened on the night he was doing a trickle-feed water change! Take, for instance, the blocked pre-filter cartridges featured in **Deadly Brew**; they were blocked by a 'quick blast' of mains water pollution that would probably have gone undetected by the water company, but which overwhelmed the purifier pre-filter.

The important thing to consider, though, is that the purifier prevented the pollution getting into the pond. It may have cost the Koi keeper a few quid for another pre-filter cartridge, and the possible upgrading of the pre-filter in total, but surely this was a better investment than having to buy a pondful of new Koi. I am sure that we all realise that a collection of Koi, lovingly built up over the years, just cannot be replaced like that.

The keepers affected have now installed washable 'pre-, pre-filters' of a slightly larger micron retention capability, and while they have had no further problems, their filters now have the capacity to cope without blocking as they did in the past.

A purifier configured as such, would possibly cope with mains water contamination like that envisaged from toxic waste, if it was largely particulate, but nobody knows, and nobody will speculate, what the adsorption capability of a cartridge would be under these circumstances. Let's face it, just how would you begin to test a purifier design for an indefinite number of unknown substances at unspecified concentrations? An impossible task!

All that we, as Koi keepers, can do is to live with the situation of worsening tap-water quality, and take the best precautions that we can to ensure our fish stand a fighting chance. **BT**

## Postscript

**1** As always with reports like this one, the story is never completely told, as in the *Wycombe Star*, Friday 8 December 1994, there was a report that the River Tyne had been sited out for six miles between *Stones End* and *High Wycombe* with cyanide which was thought to be from illegal dumping. Thousands of fish were killed in the river, which runs through one of the most affluent 'Koi-keeping belts' in the country.

**2** On Thursday 8 December 1994, the ITV programme *Kali 5* featured another report regarding pollution from the mining industry. When the coalfield at *Sally* was proposed, a feature was that the quality of the coal would be so good that there would be no spoil tip. After a period of operation, the coal quality has deteriorated and there will now, after all, be a spoil tip. This tip will be sited at a place called *Gascolow Wood* and will be the biggest spoil tip of its kind in Europe. It will be on an unlined site over one of the main aquifers in the country and there is concern that the drinking water supplies will be contaminated.

**3** Mr Waite, the principal inspector from the Drinking Water Inspectorate was also kind enough to reply to my article on pollution from the coal mines. (See *Write Back* in last month's issue of A & P). I thank him for that and would be pleased also to receive a response to *The Ultimate Nightmare*. Mr Waite says that my article was misleading. I cannot agree, as many

events that cause human misery and regret were at one time given the official seal of approval.

The people who either died or now suffer as a result of radiation from atomic testing were told that it was all right at the time, as were those suffering a slow death from exposure to asbestos. There are people all over the land suffering from hearing loss (myself included) due to industrial noise that was sustained before it was realised that ear defenders should be worn. Miners continue to suffer from silicosis, and I am sure that trust in the water companies will be a long time returning to the *Cornford* area.

I would like to ask Mr Waite just what are the measures that he suggests are in place to prevent pollution of drinking water taking place of the nature outlined in this and the previous article, and why they have not prevented the blockage of the featured cartridges (and more cartridges since the article was written). Some of the cartridges mentioned in my first article, **Deadly Brew** (A & P, Dec. '94) are carrying up to eleven and a half ounces of contamination from five to eight thousand gallons of drinking water. In nobody's imagination is this to be described as 'occasional particles collected on filters'.

My references for the article were *The Running Water Guide* by Charles Hall (Robertson McCorn, ISBN 1-85365-187-8), and *Dictionary of the Environment* by Stephen Elworthy. Both of these can be obtained from your local library and you can check on what claims I have made in respect of Alzheimer's Disease etc.



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