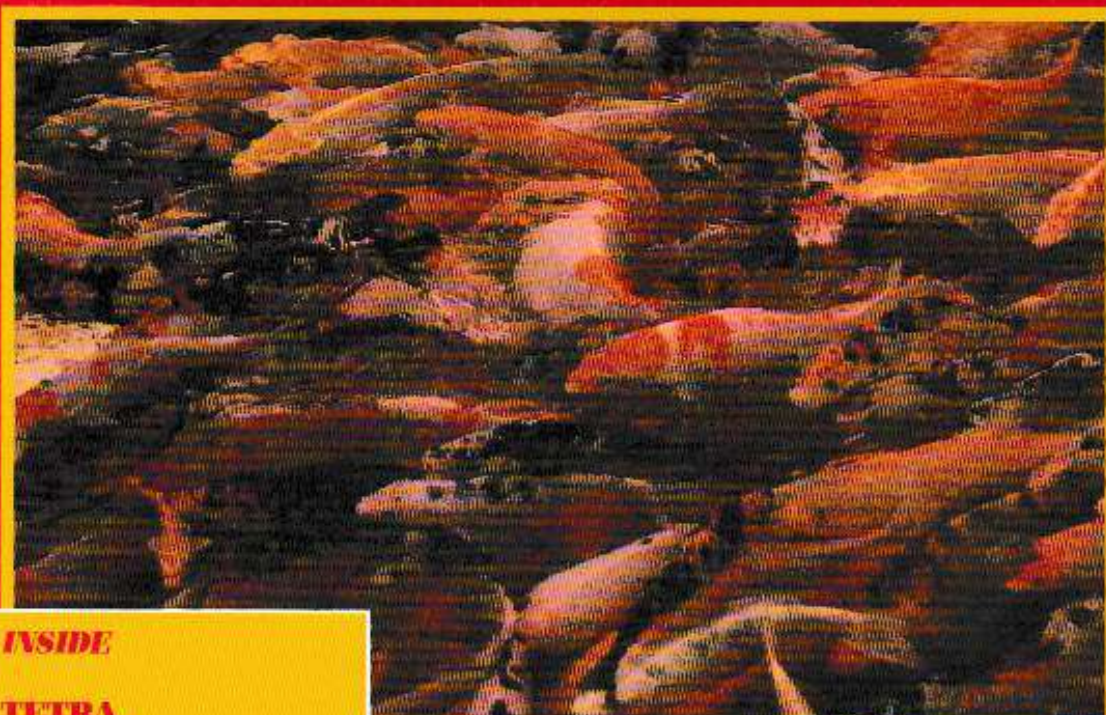


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THE LONDON AQUARIUM OPENS

COVER PICTURES



MAIN PICTURE

A pool full of Koi at feeding or breeding time is a hectic place! (Photo: Gordon Wiggins).

INSET PICTURE

This colourful Goby, *Tateurndina ocellata*, breeds in captivity. (Photo: MP. & C. Piednoir)

Comment

Fish seem to be everywhere at the moment. It was only to be expected that the opening of the new London Aquarium should attract thousands of visitors during the Easter holiday period; garden centres are bursting at the seams with water features and associated aquatic outlets; on television during one of the morning shows there were items of heron/cat scaring equipment and to top it all the Common Goldfish is being heavily displayed ... as a credit card decoration!

With all this exposure to things fishy we should all be bracing ourselves for an influx of new interest and be at our most tolerant of seemingly silly questions ("Will water-fleas bite me?" "How will I know if I've got gallons or litres coming out of my tap?"). It is so easy for long-established fishkeepers to tell newcomers how easy it all is, a fact apparently borne out by very persuasive advertising. But before you rush out, affected by a sudden burst of affluence, enthusiasm or, dare I say, a touch of the glorious sun, it will pay you to do some research into where you think you fishkeeping interests lie to prevent an equally devastating burst of New Tank Syndrome occurring. Yes, things can be easy, once you understand the fundamentals and are prepared to undertake all the necessary and, let's face it, not over-taxing maintenance tasks. Unfortunately, whilst one part of the price of failure may be paid for by us in a financial sense, a far higher price will be paid by the very animals we are wanting to keep.

On behalf of M] Publications Ltd I offer sincere regrets to Ann Telford for any embarrassment or inconvenience suffered as a consequence of letters published in recent issues of A&P. Whilst A&P does not endorse or otherwise support the opinions expressed in any published contributions or advertising material, it does have a responsibility not to publish material likely to aggravate.

John Mills

EDITOR

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SARAWAK QUEST 1

Mouthbrooding Bettas and Liquorice Gouramis

Habitat *Betta taeniata*.
PHOTO: IL H. TAN

This is an account of three trips to Sarawak to collect fish specimens. The first of these also marked my first experience fishing with the world-renowned ichthyologist, Dr Maurice Kottelat. Our main purpose was to obtain the fish record from the black-waters of Sarawak, a project supported and approved by the Sarawak Museum. Our secondary aim was to collect all Belontiids found in



Sarawak.

Being a first-timer in Kuching I made a visit to the Sarawak Museum with its excellent exhibits of cultural and archaeological interest. I also spent some time taking in the sights of Kuching — river front shops, statuettes of cats (kuching in Malay) and Sungei Sarawak, which fronts the main street of Kuching town.

The next day we set off bright and early for Sibu, a largish town in central Sarawak. The highway connecting Kuching to Sibu was

TAN HEOK HUI DETAILS A FISH-COLLECTING TRIP IN SARAWAK

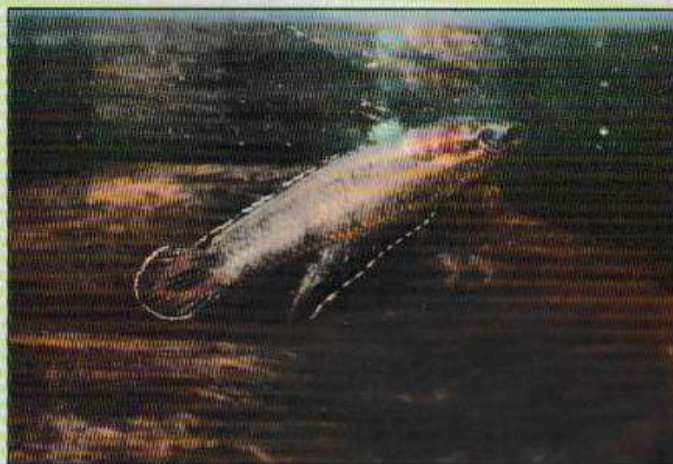
under repair and construction in certain sections, the road was basically untarred and full of stones. Most of the time, therefore, we received posterior and occasional full-body massage for kilometres on end! The weather was fine and very hot (34°C), hence it took us a full day to reach Sibuh.

The first site that we sampled the next day was a relief from all that travelling. It was a blackwater stream about 100m away from the sea, at about 28km from the coastal town of Mukah.

The water was really cool and refreshing (22°C) and from its reflected surface it looked like a stream of Coca-Cola but with a pH of 5.0. There were no aquatic plants but bank vegetation had overgrown into the water which was about 1.2m deep. The Belontiids caught were *Betta akarensis* and *Parosphromenus allani*. However, the site was otherwise quite species-poor with a total of only five other fish.

The next site (34km from Mukah) yielded *Betta akarensis* and *Luciocephalus gultheri*. The water was also black and of pH 5.3. There was intact forest parallel to the road. The last site for the day was about 40km from Mukah. It was a brown-water forest stream of pH 5.6 with luxuriant growth of *Bardaya motleyi* and *Cryptocoryne* sp. and many *Nandus nebulosus* and some *Betta akarensis*.

From some wooden platforms at the bank of the stream it was clear that it was used by



ABOVE
Parosphromenus allani.
PHOTO: P. NG

BELOW
Betta akarensis (Gedong).
PHOTO: KELVIN WEBB

the locals as a bathing place — that explained the presence of excessive algal growth and aquatic plants.

The following day we tried the outskirts of Sibuh town, near the airport which had been built over a peat swamp forest. All the streams in that area were blackwater and some were highly polluted, especially those running next to the

chicken farms. Luckily, there was a clean stream at the northern end of the airport. The pH of this stream was 4.9 and there was *Bardaya motleyi* present. We caught *Betta akarensis*, *Parosphromenus allani*, *Trichogaster trichopterus* and *T. pectoralis*. This was a memorable site because I was stung by a hairy caterpillar feeding on the



bankside vegetation.

The next site was a small river, north of the Durin ferry point toward Sibuh. This was also blackwater and with a depth of 1.5m. Here we obtained

Parosphromenus allani and *Betta akarensis*. A new species of puffer fish, described by Kottelat and Lim (1995) was also caught —

Carinotetraodon salivator. It is a dwarf species and reaches an adult size of about 5cm standard length. *Rasbora axelrodi* was

also found here in small shoals. These are interesting fish with a somewhat similar colouration to the Neon Tetra, hence the name we gave it, the Neon Rasbora.

My second trip to Sarawak proved to be most interesting. *Betta taeniata* was at last found by pure and simple unadulterated good luck. This time round we concentrated on the areas around Kuching.

We proceeded to sample the areas around Matang where Horst Linke had collected some *Betta taeniata* before but no Belontiids were caught, which was very disappointing. At the last site of the day, 10km

from Kuching in the Matang area, we caught some *Betta cf. akarensis* and two species of Snakeheads — *Channa lucius* and *C. bankanensis*.

The water was black and pH 4.1, the stream situated next to a peat swamp forest. We headed back toward town with heavy hearts.

The following day we headed toward Serian town, where we had breakfast and also visited the local wet market. There was a

FACTBOX
Betta akarensis
Regan, 1910

This species gives its name to a group of mouthbrooding Bettas comprising four species, *B. akarensis*, *B. baulunga*, *B. chini* and *B. climacura* (which is the junior synonym of *B. akarensis*). One of their most obvious characters is the ladder or net pattern in the caudal fin. These species are 10-12cm total length so need a tank of 60-80 litres with brown water at pH 5-6 and 23°C which can be raised to 26°C for spawning after conditioning on flake, frozen and live food. Males are distinguished by their slimness, the elongated anal fin and the ladder-like striations on the caudal. Spawning occurs a little way off the base after display and circling. The female collects the eggs and spits them to the male who retreats to dense vegetation near the surface to brood the young. 50-100 young are released after 12-14 days.

variety of freshwater food fish on the stalls, among which were *Anabas testudineus*, *Channa striata* and *Clarias nieuhofi*. Next we headed away from Serian to our first site, about 1km toward Gedong, a clear water, fast-flowing stream of pH 5.9. There were torrent fish here — *Homaloptera cf. tweediei* and *Nemacheilus saravacensis*. We hit pay dirt at the next site.

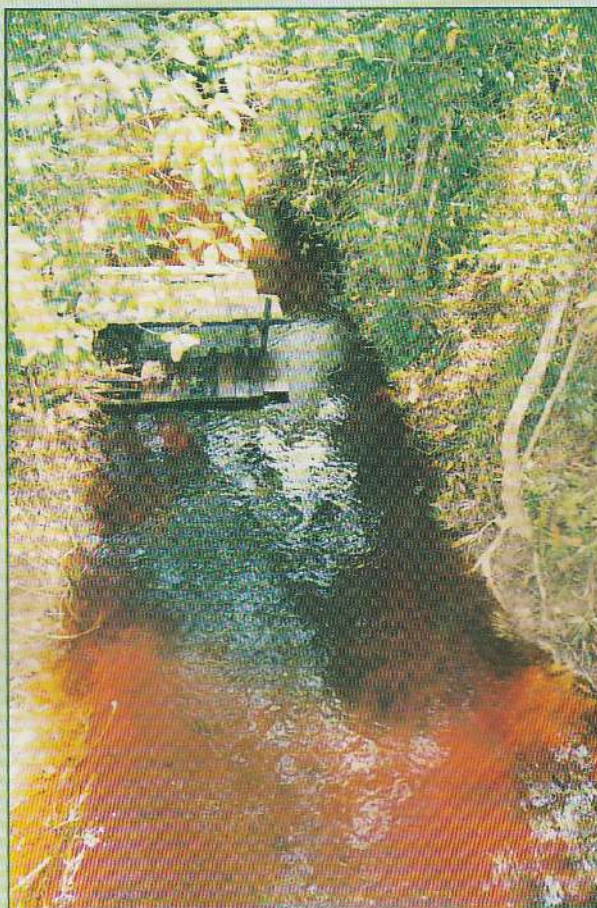
Habitat of *Betta akarensis* and
P. allani
PHOTO: H. H. TAN

TROPICAL
Sarawak Quest

FACTBOX
Parosphromenus allani
Brown, 1987

This Liquorice Gourami was collected in Sarawak in 1986 and its discovery announced in this magazine in June 1987. It has a rose-red body and black bands in the dorsal and anal of the male. Females are distinguished by the absence of pattern in the unpaired fins. They can be kept in water of pH 4-5 at 21-24°C and fed live food. As they barely exceed 1in pairs can be kept in two gallon tanks where they spawn in small caves such as flower pots or tubes anchored to the base. The eggs can take five days or more to hatch and the 10-30 fry do not swim free for a further five days but will take Brine-shrimp nauplii immediately.

Factbox information supplied by David Armitage of the Anabantid Association of Great Britain.



FACTBOX
Betta taeniata
Regan, 1910

This name has been falsely attached to a number of species over the years but the real *B. taeniata* is a mouthbrooder which grows to about 6cm. It is distinguished by the broad black edging to the blue border on the unpaired fins. It may be maintained in medium-sized tanks with soft water of good quality at 24°C and 5-6 pH. It eats a variety of commercial, frozen and live food. Males are more brightly coloured, the fin borders are darker and more iridescent; females are paler especially around the operculum and the borders of the unpaired fins. The temperature should be raised to about 26-27°C and the embrace occurs near the aquarium base. The female picks up the eggs from the male's anal, then spits them to him. He will release the fry after 10 days but they are usually swallowed after three days or less as they are easily disturbed.

— *Betta taeniata*! This river was about 7km after Serian into the turn-off directly after the town and a further 6km into a right side road. We were about to give up when we decided to just keep going for a few minutes more. Voila! A small river, about 10m at its widest and up to 1.2m deep, flowed across the road. The water was clear, pH 7.0. The substratum was gravel-strewn with stones and rocks. In certain stretches there were riffles and these were very fast-flowing. There was no aquatic vegetation but Rheophytic aroids were present.

TROPICAL Sarawak Quest

The first dip of the net brought up a Betta. It was a rather short and stocky specimen with short fins, which had blue edges on the caudal and anal fins — *Betta taeniata*! We were excited and exhilarated but although we fished for about three hours only managed to get about 10 specimens.

Torrent fishes were also present in this river — *Paracrossochilus vittatus*, *Homaloptera cf. tweediei*, *Gastromyzon fasciatus*, *G. punctulatus*, *Nemachilus saravacensis* and *Glyptothorax sp.* This was the first time that I had caught *B. taeniata* and *Gastromyzon*, moreover in the same habitat. Initially, when I first caught *Gastromyzon* I thought it was a torrent tadpole but on closer inspection it had two pairs of splayed-out fins on the anterior part, with a rather colourful caudal, streaked with blue. The body colour was blackish, one species had a barred pattern (*G. fasciatus*) and the

other was spotted (*G. punctulatus*). We met an Iban local, who identified *B. taeniata* in the Iban vernacular as 'Ikan T'pachi'. After this site we headed back to Kuching for a celebratory dinner.

Next day we set off with two Sarawak Museum staff to guide us around the Lundu area, west of Kuching. The road around that area was still under construction, so we had a very bumpy ride. It was also a very hot day so that some unripe bananas, bought in the morning and left in the car, were literally cooked brown by the end of the day. The streams sampled in that area were generally shallow and clear and depopulate. No Belontiids were caught.

As we headed back to Bau, somewhere about mid-way, we stopped to sample a small river. It had slightly tea-tinged water (pH 6.8) and was quite fast-flowing in parts. Aquatic vegetation was present — *Cabomba* and *Barclaya motleyi*. The presence of *Barclaya* indicated that there was a swamp forest upstream. The stream yielded one Betta species. When I first caught it I thought it was a large *Betta taeniata* (50mm SL). It had a rather broad, pale-blue anal fin edge and a little blue on the caudal, together with an iridescent greenish-blue operculum. On closer examination I realised it was actually a specimen of the *B. pugnax* complex — the first to be reported from Sarawak.

Luciocephalus pulcher and *Nandus nebulosus* were also caught. Torrent fish like *Homaloptera cf. tweediei* and *Glyptothorax* were also found here. *Caranotetraodon salivator* were obtained, although they were very difficult to catch as they prefer the deeper parts of the waterway.

A note of interest from our observations driving around Kuching was that it is a city of roundabouts. At every junction there was a roundabout. Someone should count the number of roundabouts in Kuching and perhaps rename it 'City of roundabouts' rather than 'Kuching' which means the city of cats — because we hardly ever saw any cats!

For further information on Labyrinthfish send an *sae* to: AAGB, c/o 19 Chiltern Crescent, Spolbrough, Doncaster DN5 7PE.

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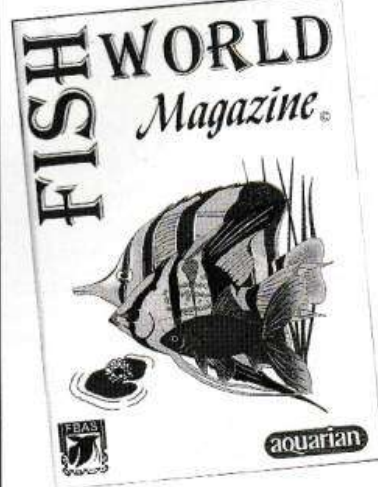
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SHORE WATCH



BY
**ANDY
HORTON**

A rocky seashore is such a varied and interesting place that a rockpooler could expect to find something new on almost every visit to the shore for many years after starting the hobby. At first the variety of the small rock pool fish, crabs and other interesting invertebrates are likely to pose problems in identification. Even experienced shore-watchers face problems with the Sea Slugs, Sea Anemones, Small Spider Crabs and Molluscs (Marine Snails) when they find rare and unusual species.

May is an interesting month on the shore, because the warmer weather makes a trip down to the beach a more pleasant experience, and because there will be plenty of fish fry in the shallow water. Peering into still pools is easier without a spring breeze rippling the surface.

In the column for the year I will examine some aspects of the biology and behaviour of the rock pool

Speculation

Man is exploring the vast expanses of space, but nearer at home we still do not know all that much about the life in the oceans that cover 71 per cent of this planet. Even on the British coast where the species that can be seen with the naked eye have been identified, we have no definite information on exactly why some of the creatures are prevalent in one year, and uncommon in another. Every

fish and marine invertebrates that are both interesting and useful knowledge for aquarists.

feeder on mussels, and the mass movement of these starfish probably occurs in a relentless quest for food. But also, it may have been a particularly successful year for the species with more juvenile starfish surviving the hazardous planktonic stage.

Fluctuations

To find something new on the shore is a great incentive to the experienced rockpooler. At first, this will happen almost every visit, but after ten years or so I begin to notice subtler changes in the fauna, like the increase of oysters between the tides after the warm summers of 1995 and 1996.

Because of the great variations from year to year identification of any trends is very difficult to spot.

This is also true for commercial fish species where the numbers will vary for natural reasons, which for some inshore fisheries makes nonsense of the 'quota' system.

Shorewatch is all about the collection of information about the fauna at low tide on the coasts throughout the length of the British Isles. We would like to hear of reports of what small creatures inhabit on each shore. Surveys have been undertaken for many intertidal areas over a period of three years to register the common fauna, but this is not over a long enough period.

year on the same stretch of coast is different, and shores a few miles along from another can vary considerably.

Speculation on why a small snake-like fish called the Butterfish or Gunnel, *Pholis gunnellus*, is much commoner on the shore in the north than the far south can be surmised. The distribution of many animals is temperature related, and this Arctic fish simply will not tolerate sea temperatures over 21°C.

The same applies to the Common Starfish, *Asterias rubens*, which is unable to tolerate warm water. But why does this starfish migrate on to the shore in millions about once a decade? Study of this animal quickly reveals it is a voracious



The freak claw of a Lobster captured by John Barker at low tide under Brighton's Palace Pier.

PHOTO: ANDY HORTON

so records from amateur naturalists have their value.

Rarities

Although I have discovered many things about life on the seashore I would never have been able to read in books I have never been fortunate to discover anything really unusual like John Makeham did on Looe beach at the beginning of December last year. He rang me up to ask if I could identify a yellow Sea Slug with a limpet-like shell on its back. There was only one animal it could be: *Tylodina perversa*. The only trouble was that this species was not meant to be here. It lives only in the Mediterranean Sea and is the first on record for this country. Unfortunately, the rarity was not appreciated at the time and the Sea Slug got eaten before it could be verified by an expert.

With the publicity about the very real 'Global Warming' it would be tempting for some people to speculate that the occurrence of warm water species in British seas is as a result of sea temperature increases. This has been suggested because of the regular occurrence of the Triggerfish, *Balistes capricus*, in the English

Channel during the last decade. However, I suspect that the vagrant Sea Slug arrived because its planktonic stage was in the ballast water discharged by a ship visiting nearby Fowey Harbour. If Pilchards, *Sardina pilchardus*, return to Cornish seas then I will be persuaded that the water is getting warmer.



Young visitors to the BMLSS Aquarium and dry exhibit stall at the Low Tide Exhibition 1996. The 1997 event will take place on Saturday, 24 May. PHOTO: ANDY HORTON

Rare fish

There were quite a few reports of unusual fish during 1996. Notably these included an Atlantic Bonito, *Sarda sarda*, caught off the Pembroke peninsula in July; a Moray Eel, *Muraena helena*, captured in a

lobster creel near Herm in the Channel Islands in December; and a Swordfish, *Xiphias gladius*, jumping out of the sea in the Forth of Lorne off the west coast of Scotland, on a fine day in September. Mevagissey Harbour Marine Aquarium were presented with a Comber, *Serranus cabrilla*, by a local Cornish fisherman in June. This

was a juvenile fish and there may be a breeding population off Cornwall, but records of capture are still very unusual.

In January 1997 Richard Lord (Fish Information, Guernsey), reported several captures of the Short-nosed Seahorse, *Hippocampus hippocampus*, from around the

Channel Islands and it appears that there is a fairly extensive breeding population because the captures came from deep water (over 40 metres) in several different areas.

With thanks to Kate Lock (Skomer Marine Reserve) for the Bonito report and Andrew Johnson (University of Glasgow) for the Swordfish sighting.

Latest news

Inevitably, by the time you read this, the reports are somewhat old. However, for the latest news on the marine environment, readers can access the British Marine Life Study Society (England) site at: URL=<http://ourworld.compuserve.com/homepages/BMLSS/>

The 'Net Surfer' will need to follow the link for 'Latest News'. There are also more detailed reports for 'Rare Fish', general information and links to other marine wildlife sites all over the world.

Alternatively, reports of marine wildlife or details of the BMLSS can be obtained from: The British Marine Life Study Society, Glaucus House, 14 Corbyn Crescent, Shoreham-by-Sea, Sussex. BN43 6PQ. Tel/Fax: 01273 465433. Please enclose a SAE.

The European Oyster, *Ostrea edulis*, returned to some rocky shores after breeding in the hot summers of 1995 and 1996. Sperm and eggs are released from May to August. The white and yellow Gastropod (Marine Snail) is the Dogwhelk, *Nuccella lapillus*, which attempted to drill a hole in the hard shell of the Oyster to feed on it, but failed. PHOTO: ANDY HORTON



The British Marine Life Study Society will help readers who have any difficulties or wish to pursue their interest in the marine life around the British Isles. The first enquiry will be answered free of any charge, but please enclose a SAE. For more information write to: Andy Horton, British Marine Life Study Society, Glaucus House, 14 Corbyn Crescent, Shoreham-by-Sea, Sussex. BN43 6PQ. EMail: 106127.206@CompuServe. Internet URL= <http://ourworld.compuserve.com/homepages/BMLSS/homepage.htm> (England) Internet URL= <http://www.ed.ac.uk/~evah01/bmlss.htm> for BMLSS (Scotland).

ADVERTISEMENT FEATURE



Left: Tom and Anne Cannon proudly display their vast array of trophies.
Right: The fish take pride of place in Anne's kitchen.

1 fish house

ON A RECENT VISIT TO TOM AND ANNE CANNONS' HOUSE IN WORKINGTON
DAVID FORD FOUND THAT FISH HAVE EVEN TAKEN OVER THE KITCHEN.

As soon as you walk in the door of Anne and Tom Cannons' house in Workington, you know you're amongst real fishkeeping enthusiasts. Two big tanks greet you in the hall and even the cloakroom has posters and charts on fish. "We're running out of space," says Anne, "fish have even taken over the kitchen."

The Cannons' kitchen is, indeed, an amazing sight, with two entire walls given over to fish. Six large tanks beautifully integrated in mahogany units dominate the room. Instead of cookbooks, the shelves in Anne's kitchen display Axelrod and dozens of expensive hardback books on fishkeeping. Even the china mugs have pictures of fish!

Tom has been interested in fishkeeping for many years but it wasn't until he took early retirement six years ago that he was able to devote the time needed to reach the top of the hobby – and Anne quickly caught the bug!

The outside fish house, that Tom built, is divided into two areas – one for his fish and the other for Anne's fish. Although both show

together there's a bit of friendly rivalry too. At first it was Tom's fish that were winning the awards – but, in the last two seasons, Anne has shown that winning top prizes certainly isn't the exclusive domain of the male. In 1995 Tom and Anne, as reigning 'Scottish Supreme Champions', won over 200 awards including almost 70 firsts. This year their haul looks to be even more impressive!

Their lounge is evidence to their success with an unbelievable display of trophies covering much of one wall. "I've no idea how many there are," says Tom, "but there are a lot more we can't find room to display."

The lounge also boasts two superb large aquaria built into surrounds, with stone reclaimed from an old railway bridge. "Fish are beautiful creatures," says Anne, "and they deserve to be given space in a well planted tank – not just exist in glass boxes."

Both Tom and Anne also hold strong views about breeding and showing fish. "We now breed most of the fish we show," says Tom, "and limit the number of times we take any

one fish out to a show – no matter how successful it is. Feeding is also very important – we've tried all the foods on the market but have found Aquarian® to be the best by far. We use the fry and growth foods plus both Aquarian® Flake and Granules for our mature fish.

Looking around Anne and Tom's home you have to admire their dedication apart from their success which, in part, they admit comes from feeding exceptional food – Aquarian®.



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GENETIC CHANCING

BARRY GOODWIN TAKES A LOOK AT THE GENETIC PROBABILITIES INVOLVED IN BREEDING YOUR OWN KOI

PHOTOGRAPHS BY THE AUTHOR

Wouldn't it be nice if we could nip off to the nearest Koi dealer, buy ourselves a pair of nice Showa, wait until the Spring arrives, let them spawn, raise the fry, and make a killing by selling off the whole 250,000 of them for £5 apiece and in the process put every other Koi breeder out of business?

Have you ever wondered why this doesn't happen? Well the answer is that nothing is ever as easy as it

may at first seem, particularly when it comes to breeding Koi.

The Japanese are the masters of Koi breeding, having bloodlines that go back over a lot of years. The Israelis are catching up quickly and the Aussies (who incidentally can't import Koi from anywhere outside the Australian mainland) and the Americans were at the last count producing some reasonable Koi specimens.

However, it seems, perhaps because of a lack of suitable brood stock, that nobody in the UK has yet

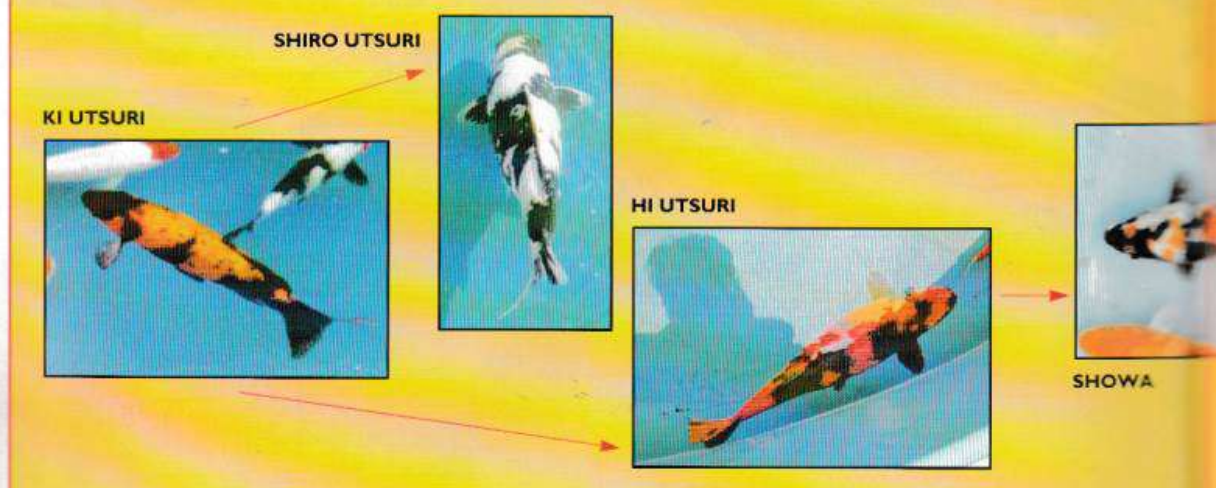
been able to breed a Koi that would not be looked at with scorn by a Koi judge. Why is this?

To even begin to understand you must first of all know a bit about the genetics of Koi and also appreciate that because the Koi industry is worth a lot of money to the Japanese they aren't about to let any Koi that can be successfully bred, producing Show Class winners, slip through the net. This would mean the erstwhile UK breeders that they sell to can take the food from their plates — it is as simple as that.

UK BREEDING

We often hear that breeders in this country have imported so called 'brood-stock' at great cost, but then nothing more is heard. What has happened to this stock? Has it failed to produce the results expected? Didn't the erstwhile breeder know enough, or is somebody out there sitting on the fringe of a major breakthrough? If so I haven't heard a whisper of it and haven't heard of anyone having even a limited success. Even large fisheries who say that they

AN EXAMPLE OF GENEALOGICAL POSSIBILITIES



'breed' Koi will only offer for sale grown-on Japanese or Israeli Koi to the general public, with not a hint of anything resembling quality from their own breed of stock. Let's look at some possible reasons for this lack of success by the UK breeder and the UK hobbyist in the Koi production stakes.

As anyone who breeds dogs will know, if a pedigree dog is bred with a pedigree bitch, then pedigree puppies will result. These would be referred to as genotypes (carrying the true genes). If, however, your pedigree bitch gets out through a hole in the fence and is seduced by next door's Jack Russell, then the resultant litter may be two puppies that look like Jack Russells, and two that look like whatever your pedigree dog is. These could be mistaken for pedigree dogs but would bear no certificate and all of these puppies would be genetically impure, being referred to as phenotypes. If



A pond full of very nice Koi — but what will their offspring look like?

these phenotypes were bred further, even the ones that looked right, a mish-mash of looks would be the outcome, whereas if the genotype puppies were bred the resultant litters would be pedigree looking true to their breed, as the parents

were genetically pure.

This works the same for any creatures, including Koi, so perhaps there we have the commercial answer. The Japanese very possibly export to us Koi from spawnings where only one of the parents was genetically pure, and when we try to breed from them, we get ... yes, you've guessed it ... rubbish! The parents are the bloodline, not the offspring, which only have to look right to be a saleable commodity.

It is also possible to sterilise Koi by simply immersing them in a chemical bath, and some of the chemical baths that we use for anti-bacterial treatment in the UK are very effective at doing this. Koi can be sterilised 'en masse' by this method, so what is there to say that this is not carried out in connection with the larger and better quality of Koi that are exported to the UK, thus preventing the export of the jealously guarded

bloodlines?

Obviously there is something very special about breeding Koi, and to get a Sanke it is not as simple as mating a Sanke with a Sanke — you would probably get one or two Sanke, but mostly rubbish from such a match. It has been said that when the parents of some absolutely top-class Showa were seen then it was an eye-opener, as you would not have given either of these Koi a second glance if they were for sale in a dealer's vat, and they certainly wouldn't win any prizes for you in a Show! The secret has to be somewhere else, and that is where we must delve into genetics a little to find out what makes the Koi breeder's mind tick, and how he knows just what sort of fish to expect from mating various bloodlines of Koi together.

SCALATION

There is something to



KOI Genetic Chancing

help us out here in the form of a table, or diagram, known as the Punnett Square (see next page) where, in this case, the inheritance of scalation from different parents can be predicted with some certainty. Of course there are always the accepted 'accidents' where abnormal scalation can be produced.

Considering the genetic make-up of Carp, their genes for producing scalation in offspring can be divided into two types, the heterozygotic or SSNn, and the homozygotic or Ssnn, and breeding only from these combinations using genotype fish will produce a fully scaled fish as an offspring. The dominant gene is denoted by the use of capital letters.

When considering the Leather, or scaleless type of Carp, this is heterozygotic, in this case sNn, and because of the Nn gene they will never produce fully-scaled Koi. Also, when breeding scaleless Carp to scaleless Carp, if the male sN gene is combined with the female sN gene this is a lethal gene combination and

A Punnett Square for the crossing of two striped carp. Note the frequency of the NN, or lethal gene, combination.

♀ ♂	SN	Sn	sN	sn
SN	SSNN	SSNn	SsNN	SsNn
Sn	SSNn	SSnn	SsNn	Ssnn
sN	SsNN	SsNn	ssNN	ssNn
sn	SsNn	Ssnn	ssNn	ssnn

the resultant NN gene results in the death of embryonic fish before hatching. This can account for the low productivity of some spawnings.

The Mirror Carp, being that with scales along the dorsal area only, is homozygotic with ssnn genes only, and breeding like with like here can only produce a Mirror Carp.

The Striped Carp has rows of scales along both the dorsal and lateral areas, and is the one which we commonly refer to as

'Doitsu' (being a Japanese version of the word Deutsche, meaning German), although this description appears to be used to describe all three of the Leather, Mirror, and Striped varieties. These have heterozygotic genes, SSNn or SsNn, and the crossing of these can produce very interesting results, with offspring of every variety of possible scalation inheritance. There is also a lethal NN gene combination here.

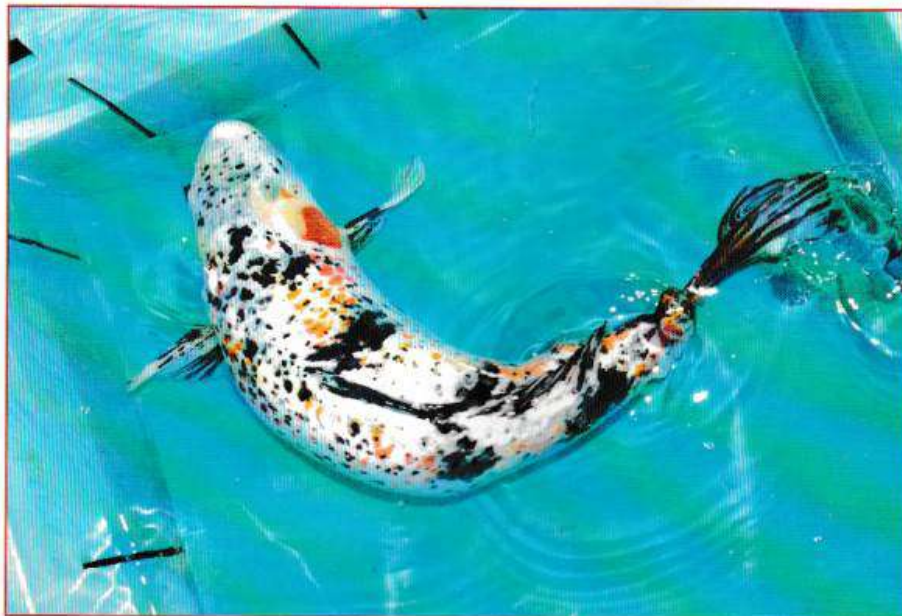
Of course it is possible to

interbreed all of the scaleless types of Carp with the fully-scaled varieties, producing offspring of a wide variety of scale patterns which we see as 'pearl-scaled', or 'armour-scaled', or even fish with small and large scales together. It all adds to the charm of the Koi and our enjoyment of the hobby.

COLOUR AND PATTERN

When considering the inheritance of colour and pattern things become a little more complicated, as just from looking at a fish you would not be able to tell what its genetic make-up encompassed, and breeding from a particularly good looking fish may produce offspring with no identifiable variety at all! It may be that the fish you are trying to breed from was a phenotype — say a Sanke with very good markings which came from Kohaku bloodstock. Instead of being culled from the Kohaku offspring it was passed down the line as a reasonable Sanke. It was a throwback,

This Koi holds the certificate for 'The Ughest Koi in Lincolnshire'. Could it just be a homebred.



KOI Genetic Chancing

and breeding from it may produce a wide variety of Koi, some of them reasonable Kohaku at the time of their sale, that are very prone to shimis (black spots) in later life! We can liken this to human inheritance, where a mixed race marriage may produce throwbacks generations later, where a white child may be 'thrown back' to a coloured family, or a coloured child to a white family.

The characteristics that are genetically passed down the line are the main characteristics of the variety, in other words a genotype black Koi when mated with another genotype black Koi will produce black Koi mainly. This does not necessarily mean black all over, but can be such as Hajiro, Hageshiro, Kumonryu, Shiro Utsuri, Matsukawabake, etc. Breeding other colours (from other black-based fish) into the Utsuri line will hand on the inheritance of these colours to the Utsuri line and possibly produce Showa. It is possible over many years and many generations to produce Showa that when bred with Showa will produce mainly Showa offspring, by stabilising the characteristics of the Showa colour inheritance, ie, a black-based Koi with white and red patterning. The inheritance of good skin quality can be passed on by interbreeding with another Koi that has very pure white skin, this will then be passed to the offspring but will possibly modify the overall presentation.

It must be realised at this stage of the game we are not interested in maintaining the pure bloodline — that has already been established with the parent Koi. All we are interested in doing at this point is commercially producing Koi that look like the parents, but will certainly be phenotype and no good for breeding from

themselves. All Koi that do not come up to the standard for colour, pattern, body shape, and skin quality are culled long before they get to the market place.

Of course the most frustrating thing for the breeders is that whilst they can control the inheritance of colour with reasonable certainty they cannot control how that colour is distributed about the Koi, or what the pattern displayed by individual colours will be, and this is one reason for large quantities of Koi being culled before sale.

Now that we have a genetically-engineered sheep to give us good quality wool and meat, and genetically-engineered pigs set to produce organs for human transplant, perhaps this science may extend to Koi and then we should really have something to see! Can you imagine it — a vat full of Grand Champion Showa — all exactly the same in colour, pattern and shape? What a boring hobby this would become!

Take a Showa spawning, there may be up to 250,000 eggs from this single event, and possibly only 2 per cent of these would finish up as traditional Showa. If the rest had to be culled, then it would mean commercial 'seppuku' for the organisation concerned. Either that or the price of Showa would go through the roof!

SPIN-OFFS

Fortunately there are many other Koi from such a spawning that are very attractive, and have therefore been placed in sub-varieties which add to the overall interest of the hobby. For instance, Showa with a

high proportion of white are called 'Kindai' or modern Showa. Showa with a high proportion of red are called 'Hi Showa'. Showa with shadowing on the white areas are called 'Kage Showa', and those with smudged black are called 'Boke Showa'. Some of these are classed as Kawarimono and not Showa at all.

This not only reduces the cull from the 'traditional' Showa line, but provides, for western eyes at least, Koi that are even more attractive to many than the accepted form. In fact, all of these sub-varieties are now becoming more 'the accepted form' — even in Japan where the Kohaku rules supreme.

The 'catch-all' Class of Kawarimono is that where imagination can run wild, with some of the most beautiful Koi ever produced now coming into the UK. A lot of these are throwouts from other lineages, and whilst the traditional feelings in Japan are towards the 'Go-Sanke' (Kohaku, Sanke and Showa) lineage, my personal feelings are that a really good Ochiba Shigure will find a more favourable position in my own pond than would a Kohaku which I find rather 'boring' — but that is personal taste.

Most of the varieties in the Kawarimono class started off as throwouts from the 'higher' classes of Koi, genetic accidents so to speak, but in recent years their value has been realised and now some of them are bred in their own right with reasonable bloodlines having been established. There are some really nice Chagoi, Soragoi, Ochibas and so forth now readily available and at reasonable cost for the discerning Koi keeper to

choose from.

As genetic inheritance is responsible for the onward transmission of all the traits that make a Koi attractive to us, unfortunately it is also responsible for passing on some of the less attractive characteristics we note in Koi.

HEALTH?

As with all animals, including human beings, inbreeding is responsible for these peculiarities and sometimes they are not as obvious as they might be. I have often said that the better varieties of Koi are bred with everything else in mind other than good health — looks take precedence over all.

This is borne out in reality, for if you ever suffer from a pond environmental problem at any time then it is always your better and most expensive Koi that suffer the most. How often have I heard that complaint, and it must surely have a lot to do with inbreeding? This is why, when talking about Koi, that water quality is always uppermost in people's thoughts.

The knowledge of breeding and the skill in genetics exhibited by the Japanese and Israeli breeders must always be backed up by an equal amount of skill demonstrated by the Koi keeper. Only in this way will you be successful, and if you do wish to breed your own Koi then perhaps you will now understand why you will never be able to get that 'Grand Champion' from your existing stock, and also why even the best breeders in the UK still can't manage it.

Don't let that discourage you, though, for there is nothing as satisfying as actually letting your Koi spawn, and raising the eventual fry, even if they would all have been culled out of hand by the overseas masters.



FROGS & Friends

By BOB and VAL DAVIES



Reptiles can be dangerous!

In *Frogs and Friends* (January 1996) we warned readers to consider the ultimate size of certain reptiles before buying them, mainly because of the problems associated with housing them. There can be other problems, namely, that large snakes and some large lizards can be dangerous. The larger species of snake are readily available, some of them being bred regularly in captivity.

As we have previously mentioned, legislation in the USA restricting or banning the keeping of large snakes is on the increase, motivated partly because of attacks or escaped specimens which have terrorised the local populace. Escaped snakes seem to feature regularly in American newspapers. One recent report concerned a venomous Egyptian Cobra whose owner regularly placed it on the lawn to bask.

At least three cases of Pythons (one being a 13ft/4m Burmese Python) killing people have been reported in the last year, two in America, one in Canada. Another report gave details of a 9ft Burmese Python which wrapped around a pregnant woman — its head was sawn off to rescue her.

The snake did not have a vivarium, it was allowed to



Baby Burmese Python. Sub-adult and adult specimens have been responsible for serious attacks on keepers in North America.
PHOTO: BOB & VAL DAVIES

roam the single room apartment in which the woman, her husband and their two young children lived. Another incident notes a child who was bitten. According to the mother the child regularly 'opened the

cage to tease the Python'. Obviously free-range snakes are not advisable; they will eventually disappear and larger specimens could easily attack a human, especially a young child. Snakes detect their food by scent, movement or body heat and even smaller specimens will sometimes mistake a human hand for a choice morsel.

An experienced long-term breeder of large snakes in the USA warns would-be keepers that no snake, no matter how 'silly-tame', can be guaranteed never to bite. He was severely bitten by a large specimen which had been a 'pet' for many years. One golden rule is that two people should be present when opening the cage of a large specimen. Large snakes are powerful creatures and could cause horrendous damage to the keeper's face if they managed to grab. It would be nigh on impossible to make them let go — a bite is usually followed by constriction!

Outdoors

The recent spring was a good one for the frogs in our pond — around 15 breeding pairs produced masses of spawn. The first pair was seen in amplexus on 17 February when water temperatures were 40°F (4.5°C), although the first clump of spawn was not produced until 3 March, actually in the fish pond from where it was removed for safety. The water temperature was 44°F (6.5°C). Having placed this clump in a gap between a plant basket and the pond edge it seemed to attract the other pairs who all attempted to spawn as near to

it as possible! By 11 March spawning was in full swing, the gap behind the basket practically solid with masses of spawn. As usual there were seven or eight surplus males, some females had three clinging to them, all croaking away and kicking their hind limbs trying to dislodge their rivals. This burden prevented the females from clambering among the main spawn mass, they remained in the deeper area, treading water. In spite of this, several clumps of spawn were observed in the deeper parts away from the main cluster. One dead female was seen; it is not clear whether she drowned or was simply squeezed to death.

Conservation matters

Albania

Just prior to trouble breaking out in Albania a report claimed that an estimated 10,000-15,000 Albanians eked out a meagre living by catching frogs for the restaurant trade — one of the few export industries in the country. Most of the estimated 400 tonnes pa were going to France, the rest to Italy.

Slovenia

All amphibians except Fire

Salamanders are protected under Slovenian law, even so frogs' legs, usually from a local pond, feature on the menu of many restaurants.

Mexico

Thousands of Turtle eggs were stolen and large numbers of Turtles killed from a protected Turtle-nesting beach when guards left the site to defend a local town during an attack by anti-Government guerrillas. Since the local Turtle industry, the main employer, was closed for reasons of conservation, locals claim their livelihood has disappeared.

Caring for baby Chameleons

In the last few weeks we have received a number of calls from people requiring advice about baby Chameleons they bought which failed to feed and died. Several of the Chameleons were the Yemen



Three month old Yemen/Veiled Chameleon. Having grown considerably since hatching it is now ready to go to a new owner. PHOTO: BOB & VAL DAVIES

or Veiled Chameleon (*Chamaeleo calyptratus*). This species is being bred in substantial numbers and is possibly one of the 'easiest' Chameleons to keep. Although it is difficult to say from a distance why these Chameleons did not thrive several reasons spring to mind. The dead Yemen babies were 2in (5cm) total length when bought. At this size they were probably newly-hatched.

Specimens of this species which we have hatched were almost 3in (7.5cm) at hatching. The stress of being moved into new surroundings/conditions may have caused continual refusal to feed.

If young reptiles are housed in a very large vivarium they may not be able to find food easily. The vivarium size should be increased gradually — Chameleons need to be able to reach all corners of the vivarium so that their food is not

inaccessible. Baby Chameleons usually do better at slightly lower temperatures than those recommended for adults as they tend to dehydrate quickly if it is too hot. Thirsty Chameleons will not usually feed. Moisture, in the form of a light misting twice daily which the Chameleons lap from their

surroundings, must be provided. In a hot vivarium the water may well evaporate before the babies have had enough.

Food obviously has to be small enough for their mouth and it is advisable to try different foods if one type is refused. If a youngster has been used to Brown Crickets it may well refuse to eat black ones and visa versa. Another point is that if temperatures are too low for that species the animal will refuse to eat. Low temperatures combined with wet conditions may also lead to respiratory diseases.

Finally, it is better to purchase Chameleons which are at least several weeks old. Try to see them feeding before purchase and try to ensure that they are not from related parents as they could carry genetic weaknesses which could prevent them from thriving.

Tortoises at risk?

Having reported last month on the terrible fate of the Horsfield's Tortoises in Sweden they were in the news again shortly after. *The Sunday Telegraph*, 2 March, carried an item in which the RSPCA expressed fears that large export quotas of Horsfield's now meant that like the Mediterranean Tortoises, which used to be exported, most of them were facing certain death. It is a sad fact that before Mediterranean Tortoises were banned, many succumbed to cold, damp, unsuitable diet and inadequate hibernation.

After they were banned many keepers made serious attempts to breed them and captive-bred specimens are regularly available, although at high prices, which possibly encourages most new owners to care for them properly.

A lady telephoned recently asking if we knew where she could buy a Tortoise. We mentioned that Leopard Tortoises (*Geochelone pardalis*) were the only ones we had seen for sale at the time and explained their requirements only to be told that she wanted it 'for the children' and did not want to provide heat which the Leopard would need. Leaving a Tortoise in the garden is hardly suitable treatment although a few individuals treated this way have survived, against all the odds, for many years. Their native climate and habitat is obviously different to



Mediterranean Tortoise species — has specific needs if it is to thrive in this country. PHOTO: BOB & VAL DAVIES

ours. Sunlight is beneficial for the synthesis of Vitamin D3 which in turn assists calcium metabolism but our summers are not always hot enough, or long enough. Even summer nights may be too cool for them.

Tortoise nutrition is a complex matter. A varied diet which includes substantial amounts of calcium is needed. Just providing a few lettuce leaves and the odd tomato is a recipe for disaster. Hibernation needs close supervision and monitoring — many Tortoises formerly succumbed to their first hibernation but keeping them in a warm room for the winter usually leads to internal problems in later life. The requirements of Horsfield's have not been studied as closely as the Mediterranean species. In the wild they have a short, very hot summer, during which they may aestivate, and long cold winters during which they hibernate. They do not thrive in humid conditions.

If readers are tempted into buying Tortoises, (Horsfield's or other species) they must be prepared to provide accommodation indoors with a spot-lamp, full-spectrum lighting, adequate space and suitable substrate — specimens should only be allowed outdoors in dry, warm weather and should be in a suitable enclosure with hides and which is securely fenced. Tortoises, in spite of their clumsy appearance, can dig under fences and are remarkably persistent climbers, often scaling 'the impossible'.

A good book which deals with the care of Tortoises is 'Mediterranean Tortoises' by Brian Pursall, published by TFH.



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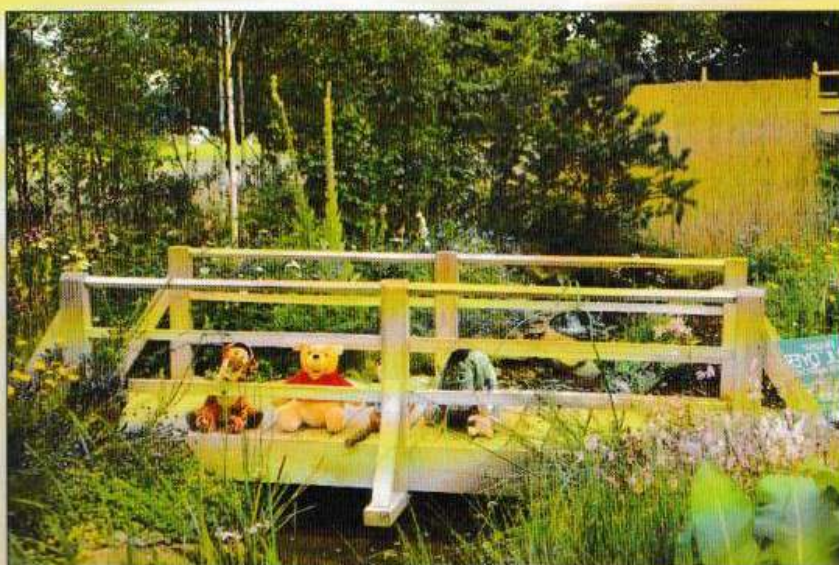
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WHAT CAN I BUY MY POND?

RICHARD FRIEND GOES
SHOPPING FOR POND PRESENTS

PHOTOGRAPHS FROM A&P LIBRARY



Some 12 years ago, when I first fell in love with pond keeping, I had to scratch around to find something to read about the subject. Finding something to treat yourself to, or ask for as a birthday or Christmas gift, was very difficult. Ready made filters were just beginning to appear, in line UV's were lurking around the corner, but there was not too much else about. Even the fish themselves had to be searched out.

Not so in these days of plenty in the pond accessory field. The world of business

has noticed a great market, and supplying the pond keeper has become a huge growth industry. Are we complaining? You bet your

POND What Can I Buy My Pond?



A Lantern Tower

red **Buddhas, Lanterns or Dragons.** Prices range enormously also, from one or two, to one or even two thousand pounds.

Should a statue have been your choice, then why not make it a real feature with **Outdoor Lighting?** Either spotting

life we're not. There is nothing better when you have a hobby than to be able to have a trip out to the shops, or in our case the aquatic centre, to browse at the items available, dream, plan, or even perhaps buy. So as we set off this summer for our favourite aquatic centre what might we be able to spend our hard earned pocket money on?

The first thing that struck me on a recent visit was the number of **Statues and Ornaments.** You are able to select from a huge range, from small stone frogs to enormous figures often of partial clothed ladies in shells or on mushrooms, or logs. Add water and you can have overflowing urns, Koi spouting water, streams out of mill stones, and even little boys doing what little boys have to do. There are also the Koi keeper's favourite of

that work of art, or bringing out the beauty of your shrubs in the dark. You can even decide to have your pond lit from under the water. There are plenty of makes to choose from these days, most at very reasonable prices for something that was once quite an expensive luxury. Most important, perhaps of all, there is good, economical low voltage lighting available. A sensible choice when playing about, and you will want to try different positions with electrical lighting systems in the garden. At the end of the day, literally, what can look nicer than a gently-lit pathway to your favourite obsession, the pond.

Still feeling creative? Then maybe a **Bridge** might be what would bring your pond to life.

You could trust to your own design and construction, but if this

sounds rather daunting, then there are ready-made bridges available. Although as to which comes first, the pond or the bridge, sounds rather like the chicken and egg situation. Should a common old bridge not be your style why not give the fish a bridge instead. Yes, you can actually purchase a see through, totally enclosed, water filled bridge. You can then sit back and watch your fish take a ride in the sky as they appear to swim through the air from one end to the other. How does it work I wonder — and how do you teach them to use it?

On the other hand, you might want to go the whole hog and treat yourself to a **New Pond,** a home for new fry perhaps, a quarantine pond, or just an addition to enhance your set-up. There are many pre-formed ponds available these days, much stronger, bigger, and very reasonably priced.

The addition of a **Waterfall or Cascade** could add an attraction to your garden.

Here you have a good choice again in the pre-formed selection. Many are now constructed

with re-constituted stone (they're the heavy ones!) or from synthetic materials that at least resemble the natural materials' original colour rather than the more gaudy, plastic hues. Always remember to underlay such cascades with a good covering of pond liner to prevent water losses.

You might feel that your pond needs a good spring clean, and decide that you should enter the **Pond Vacuum Cleaner** market, there is a good choice. The simple, hand-operated ones include the bazooka look alike 'Sludge Buster', and it will not set you back a fortune. Or you could push the boat out and treat yourself to an all-singing, all-dancing power pond vac. For around a couple of hundred pounds you will have an easy to use powerful piece of equipment that will last for years.

Do take care when cleaning a pond, especially if this has not been carried out for a long while, it is all too easy to release harmful gases



Yellow Skunk Cabbage

into the water. Before you realise it there could be the distressing sight of floating fish on your pond.

Still thinking along clean-up lines, a new **Pond Net** might take your money. There are plenty around these days. From the small pond dipping type, to the large Koi nets with long or short handles, or the best of both worlds with the telescopic type. Bear in mind a large net for handling large Koi needs a very strong handle due to enormous leverage forces set up in use; always transfer Koi into a crate whilst it is still in the water.

While cleaning up, or unfortunately, probably all the year round, blanketweed might be the problem. Fear not, there's a **Blanketweed Remover** to help. Curly prongs on the end of the handle snares the dreaded enemy, twist and pull, then back for the rest. There's always plenty more where that came from, so this

might prove to be the most used tool you ever buy!

Alternatively, you might like to come home with shiny **New Magnet**, and try your luck at eradicating the slimy green plague all together. They do not seem to work for everyone, but if you are lucky enough to be successful, this could be the best present that you ever bought your pond. Pity if you had already bought the physical remover!

Perhaps you need a **Deterrent** against the feathered, or furry kind. You can pick from plastic Water-lily leaves that give way under the weight of an inquisitive cat, or there's the electric fence that gives any bird or cat a mild hint that they might like to go elsewhere. Of course there is

always the good old faithful plastic heron. But don't be surprised if you come home to the real thing standing next to your new purchase with a glint in his eye! The latest infra-red movement detector also turns on a jet of water to flush out trespassers.

A simple, cheap treat for the pond enthusiast might be a **Plant**. This area is well catered for these days, with marginals galore, as well as the ever popular Water-lily, now available in so many different shades, from miniature, to large flowered and leafed varieties. You needn't limit your ideas to the pond itself either: there is plenty of scope should you wish to start a bog garden with many new plants and old favourites to

part you from your money.


If all else fails to provide you with an exciting package to take home, then you might like to pick up a **Book** to curl up with, or even a **Video**. There is something to cater for all tastes, from the general water gardening book to the specialist Koi keeper's manuals, or videos. Books such as *The Encyclopaedia Of Koi*, *The Cult Of Koi*, *Water in the Garden* by James Allison or even *The Bumper Guide To Ponds* by one Dick Mills are just some of the many available.

Now if you still have £20 in your pocket, why not invest in a true talking point for your pond visitors. You could become the proud owner of a large **Plastic Frog** that by means of a sensor in its nose will greet everyone as they approach with a welcoming 'Ribbit, Ribbit'!

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POND What Can I Buy My Pond?





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TROPICAL Killifish Culture

for the keeping, breeding and hatching of Killifishes. In addition to making good sense it also helps keep costs down for those operating on a tight budget.

Examples of these include empty plastic ice cream containers which make satisfactory temporary quarters and excellent hatcheries, while a highly-effective breeding mop for top spawners can easily be manufactured by simply threading strands of green nylon wool through a cork for floating on the water surface. Peat is used in the aquarium instead of mud for bottom spawners to bury their eggs in, this is then squeezed out until moist and can be stored in sealed and labelled sandwich or freezer bags whilst undergoing the essential 'dry' development stage.

Not all Killies, of course, are suited to communal living, in fact many such as the larger species of *Epiplatys*, *Aphyosemion* and most of the true annuals can

prove extremely aggressive, with males often attacking and occasionally killing others of their own kind. Fishes with a reputation for such disposition should obviously be kept separately, which in view of their requirement for only limited space is less of a problem as many more small tanks can be accommodated in a given area.

In some cases Killifish fry will also demonstrate unneighbourly characteristics with larger babies consuming their smaller brothers and sisters. This situation comes about as a direct result of the previously explained uneven hatching times and can quite easily be avoided by occasionally sorting the progeny into size-compatible batches. Often, however, some form of

culling may be necessary and many aquarists choose to leave the smallest and weakest of the brood to this fate thus reducing numbers whilst at the same time providing a source of nutritious live food for the stronger faster developing fry.

Hundreds of beautiful Killifishes from the various species that make up this diverse family are available to the hobbyist, some being simplicity itself to maintain and breed, others extremely demanding with every range of difficulty present between these extremes — in other words something to suit every level of experience and ability.

The world of Killifishes is indeed a fascinating one and for those seeking something a little different it may well offer an absorbing solution.

Anyone wishing to find out more can do no better than to contact Adrian Burge the Publicity Officer of the British Killifish Association at 14 Hubbard Close, Wymondham, Norfolk NR14 0DU. The BKA is the organisation dedicated entirely to the interests of Killie enthusiasts with a wealth of expertise at its disposal. It will provide details of the numerous varieties of Killifishes currently available (and where to acquire them) together with specific guidance on their general care and breeding requirements. By the pooling of knowledge from keepers across the country and indeed the world, members are kept fully up to date through regular Newsletters, detailed information pamphlets and local Branch meetings on everything that is happening on the Killifish scene. All this and much more make the BKA an absolute must for all Killie fans.

Tetra COMPETITION

Ghastly Green can be made Clean

A beautiful garden pond is the result of the time and care taken to ensure that a natural environment is created in which fish, plants and other forms of pond life can thrive. For enthusiasts there are few sights worse than the green water caused by waterborne algae — even if it has not enveloped the whole pond, algae clouds the water and prevents you from clearly seeing your fish, spoiling the overall appearance of the pond.

Fortunately, this is a common condition that is easily treated by TetraPond AlgoRem.

AlgoRem quickly creates clear water without adversely affecting the natural balance of pond life and plants. Its premium ingredients bind suspended algae and other particles into biodegradable clumps and clusters that settle on to the bottom of the pond. These clumps can then



be removed using a net, siphon or pond vacuum.

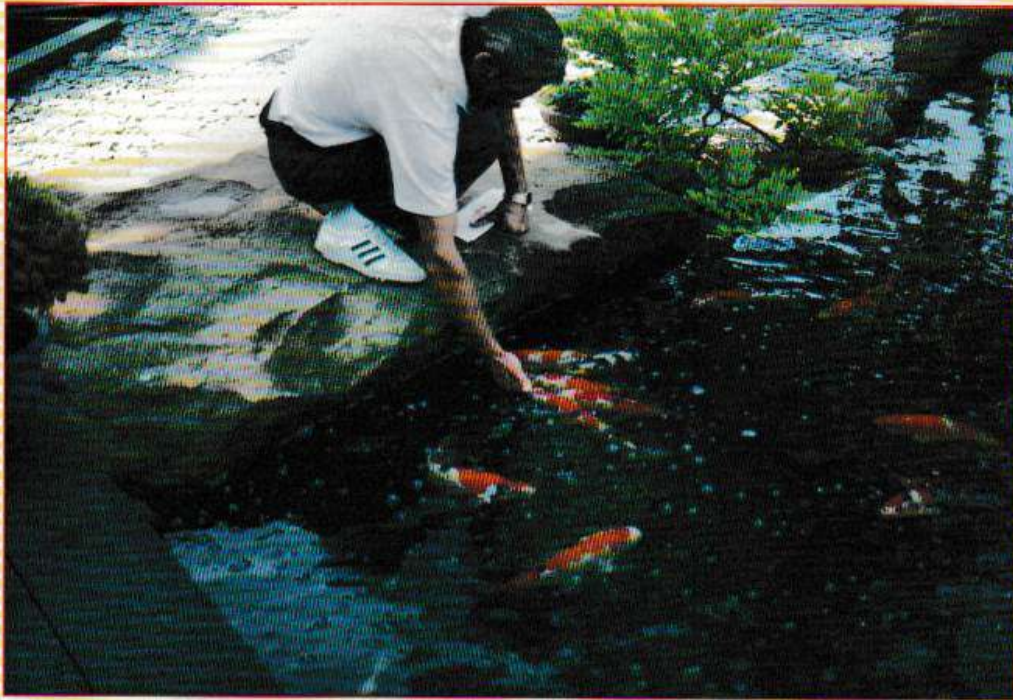
And what about other wildlife which may visit the pond? There is no need to worry as TetraPond AlgoRem is completely harmless to animals.

In this month's competition Tetra has 12 250ml bottles of AlgoRem to give away. Simply write the answer to the following question on the back of a sealed down envelope or a postcard, add your own name and address, and send to: Dept AR, Tetra Competition, PO Box 2162, Bournemouth BH2 5ZA, to arrive no later than 10 June 1997. The first 12 correct entries to be drawn will each receive a 250ml bottle of TetraPond AlgoRem.

WHAT IS GREEN WATER CAUSED BY?

Focus on
KOI

FEEDING KOI



BERNICE BREWSTER DRAWS UP A MENU FOR
CONTENTED KOI

PHOTOGRAPHS BY THE AUTHOR

Enjoying the Koi pond on a warm Summer evening is one of the pleasurable parts of keeping these spectacular fish. The warmer months are a very important part of the year, when the Koi are feeding most actively and although few of us wish to think about Winter it is actually the summer when we need to make our preparations for

the forthcoming cold period. In the winter, once the water temperature drops below about 10°C, the Koi cease feeding and will lie together in the warmest part of the pond. Although it may seem as though the fish are laying directly on the bottom they have a special organ, known as the swimbladder, which is filled with air and allows the fish to remain at any depth in the water without

expending too much energy. We all know that as water increases in depth the pressure also increases and without the swimbladder to keep the fish just buoyant on the pond bottom the water pressure, plus weight of the fish, would quickly cause it to develop pressure sores.

During the coldest periods of the year the Koi are described as 'torpid', which strictly means they

are very sluggish and more or less dormant and most activities are reduced to a minimum. The Koi are still using energy for essential functions such as respiration and also for maintaining air in the swimbladder plus making a very occasional sortie around the pond. During the winter months the Koi do not grow but the energy they use is for maintenance purposes. Any use of energy requires a fuel

Focus on KOI



source and in the winter months this is provided by food reserves laid down during the summer when the Koi are actively feeding.

All animals need a balanced diet, comprising the right amounts of protein, carbohydrate, fats, minerals and vitamins for growth, tissue repair and reproduction and Koi are no exception. The proprietary formulated feeds which are available in the form of Koi sticks or pellets are these days very well researched and provide a well-balanced diet. As may be realised the water temperature has a very important influence on feeding Koi and the quantities of the nutrients varies with each season as well as with respect to the size and maturity. Proteins are important for tissue repair and growth but they cannot be stored in the body and are therefore needed most particularly in the late Spring and through the Summer months when the fish will be growing. In addition to protein, most balanced diets contain a certain amount of carbohydrate, which is very important as this substance is used for energy and any excess is stored in muscle and liver. It is these stored

food reserves which are important in the winter months to provide the energy to keep the fish just ticking over. Fats are also used as an energy source and for tissue formation but again are stored chiefly in the liver.

Minerals are important for the regulation of many processes such as osmoregulation, the control of the amount of water in the body and tissues. Lastly, the vitamin content of the

diet is important for a range of physiological processes and if insufficient of these are present in the diet it can lead to a range of diseases. Many Koi keepers like to add a vitamin supplement to the diet of the Koi in the Spring and Autumn, such supplements may be added to the water or are incorporated into the feed using a small amount of fish or unsaturated vegetable oil to enable the powdered supplement to adhere to the

food.

As the fish get older their requirement for proteins will change quite considerably. Consider, for example, Koi fry, which are actively growing. In the wild they would be feeding almost exclusively on zooplankton, such as rotifers, copepods and Daphnia (Water-fleas) therefore have a very high protein intake. It may be surprising to learn the protein requirement for Koi fry is as high as 45 per cent of the diet. As the fry grow, their protein requirement becomes less until they need about 30 per cent of the diet as protein. Adult Koi, which are sexually mature, also require a certain amount of protein in their diet.

Unlike mammals which tend to stop growing at a certain age fish grow throughout their entire lives but once they have become sexually mature the growth rate is dramatically reduced as they invest more energy in reproduction than in growth. The mature Koi utilise proteins in the diet primarily for preparation of reproductive tissues, tissue repair and only a small amount is invested in growth.

In the winter months the



Focus on KOI

fish are hardly growing and, therefore, their requirement for proteins is considerably reduced. Once the Spring months arrive it is generally accepted that it is best to feed Koi with a wheatgerm based diet. The wheatgerm has a high carbohydrate content, which is easily digested and the breakdown products are carbon dioxide and water, which means there is less burden on the filtration system in the early part of the year when it is not operating efficiently. It is important to start feeding the Koi sparingly, excess feeding can still lead to water pollution if uneaten food is allowed to decay in the pond. As the water temperatures creep up past 15°C the diet can be gradually changed from wheatgerm to a higher protein diet. It is better to change the diet gradually by mixing a few of the new diet with the one currently being fed and slowly increasing the amount of

higher protein until the Koi are eating just the preferred diet. Once the water temperatures are at about 18°C the Koi can be given the high protein growth foods. As the water temperatures decrease through the late Summer and into the Autumn the amount of protein in the diet can be gradually reduced. As the Autumn progresses the Koi can again be fed on wheatgerm before they cease feeding during the coldest part of the Winter.

In addition to the preparatory types of feed which are available on the market many Koi keepers want to supplement the diet of their Koi with some form of treat. Fruit such as

Oranges which contain a high amount of vitamin C are a readily accepted treat by many Koi. This vitamin is associated with tissue repair, growth and reproduction but is also important in helping to alleviate stress. The oranges can be sliced and left with the peel intact and the Koi will literally tear the flesh away from the peel but remember to remove the rind from the pond. The Koi can be offered this treat on a regular basis as any excess vitamin C is readily shed from the body. Lettuce is also another source of vitamin C and some larger Koi may enjoy teasing the leaves from a whole one tossed into the pond. Some Koi find the taste of the lettuce rather bitter and are more reluctant to eat it.

Other feeds which are a good occasional treat include Cockles, Prawns, Earthworms and small quantities of brown bread. Silkworm pupae are commonly given to Koi in Japan but these should be offered to the Koi as an occasional treat and certainly should not form the bulk of the diet. Treats to be avoided include Peas, Sweetcorn, Potatoes, Trout pellets and white bread. While the Koi might well appear to enjoy these and other foods with a very high carbohydrate content, they are not digested properly and can cause the fish to store too much fat, which ultimately causes a very distinct liver pathology and can lead to their death — literally killing your Koi with kindness. Trout pellets are formulated for these predatory fish, which have a different requirement of nutrients than Carp and are not suitable for feeding in

the long term.

Anglers who keep Koi might well be tempted to give the Koi the remains of the maggots from an unsuccessful(?) day's fishing. It is better to give these in small quantities, washing any bran or sawdust off them first, avoid those which have been treated with dyes as there is some evidence they may cause cancers. The dyed maggots are becoming an increasing rarity these days.

One of the other features of any formulated food which is an added incentive for any Koi keeper to offer the fish is the presence of colour-enhancers. The attractive colours of the Koi are formed from special cells in the skin called chromatophores and these contain pigments of red, yellow and black. The Koi are unable to produce these pigments themselves but have to be supplied in the food.

Wild fish obtain pigments feeding on tiny invertebrates (animals without backbones) such as Shrimps, Algae and other plants. Carp in the wild have a large area to search for such naturally occurring foods but in the pond, which is an artificial environment, there are unlikely to be any of these natural sources of pigments and so they need to be added to the feed.

Whilst feeding the Koi is an enjoyable part of keeping these very attractive fish this is also an important part of the management strategy of the pond. In the Spring, as the fish begin feeding, it is important to use this time to spend with the fish and ensure they are eating. One of the first indications of some sort of management or health problem can be when one or more of the Koi have a reduced appetite. Observing the Koi as they are feeding and taking the time to observe their behaviour is fundamental to the welfare of the fish and their environment.



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HOT FISH!



NICK DAKIN EXAMINES THE ATTRACTIONS OF THE FIREFISH PHOTOGRAPHS BY THE AUTHOR

There aren't a great number of fish that can be regarded as a permanent 'staple diet' of the marine fishkeeper. The Anemonefish Family is certainly one, as are the Damselfish. Perhaps we might include Dwarf Angels, a few Wrasse and some Tangs. Not a huge number when there are well over 30

Families to be found in the trade at variable intervals. However, there is one small Family of fishes that are to be found in nearly every dealer's tanks at any time of the year, week in, week out.

These are the Firefish. They are colourful and exotic enough to attract the eye of nearly all aspiring marinists, yet still very affordable and not difficult to keep. More astounding

yet when it is taken into account that there are only three species of Firefish within the genus *Nemateleotris*, all encompassed by the family *Microdesmidae*!

Scientifically speaking, Firefish have had a bumpy ride. At one time they were regarded as Blennies, then quite inexplicably moved to share a Family with the Gobies; the common name

Fire Goby is still to be encountered today, proving just how confused the situation had become. Although certainly not Gobies, the Firefish 'make-over' into their new home has not really done them any favours as the family *Microdesmidae* are generally referred to as Wornfish! Most scientists now agree that here the Firefish are destined to remain.

MARINE Hot Fish

SIGNALLING DEVICE

All Firefish possess an elongated first dorsal fin ray.



So much so in the Common Firefish (*Nemateleotris magnifica*) that, to an active imagination, it resembled a leaping flame from an ember-coloured body and hence the name 'Fire'-fish was coined. In open water, the extended dorsal ray is periodically flicked forward in unison with the pelvic fins and this jerky movement is thought to be a signalling device warning others of the same species to remain at a respectable distance.

Having said that, single aquarium specimens perform the same activity and so it must be seen as an instinctive involuntary action — incapable of being curtailed even in the absence of other Firefish. The Purple Firefish (*N. decora*) and the much rarer *N. helfrichi* have a much shorter dorsal fin ray but all three share greatly similar bodily attributes: laterally-compressed, elongated bodies hardly ever exceeding 75mm (3in) in length.

HIDDEN DEPTHS

In the wild Firefish live in medium/large congregations close to vertical rocky outcrops. They have no means of defence and at the first sign of danger retreat into a convenient bolt-hole within the rocks.

Each individual has its

own favourite retreat and will not allow any other Firefish to share it. There is also some evidence to suggest that the best and safest locations are reserved for the more dominant fish. Daily activity consists of hanging reasonably motionless with head facing the current waiting for

planktonic food to drift by. Firefish are by no means adventurous by nature and if a morsel of food does not come within a certain range (usually a few centimetres) it will be ignored. Similarly, if the current is too fast, particles that are not sighted early will be left.

SHOALING AND THE CASE OF THE MISSING FISH

As we have seen Firefish are communal by nature and although reasonably happy to occupy an aquarium as a solitary individual are capable of being kept in a small shoal. A certain amount of territory will be required by each specimen and in defence of this space a degree of mild bickering is to be expected. In addition, a suitable bolt-hole is quickly sought out very shortly after the fish are first introduced. This acts as a night-time sleeping location as well as a place to withdraw to during the day. Although most Firefish tend to remain on show while the lights are on, if they feel threatened, or become particularly nervous, it is common for them to disappear for varying periods



MARINE Hot Fish

of time. It has been known for specimens to bolt into the rockwork and stay there for several months! Having been long forgotten by the owner as an unexplained casualty, a tattered Firefish suddenly decides to make a welcome reappearance to the world.

The reasons for this behaviour are not always clear (although feeling under serious threat from other tankmates must be suspected) and it is far from understood just how the fish manages to sustain itself on what must be seen as minimal nutrition during this period of hiding! Whether this sort of behaviour is common in the wild can only be guessed at but it seems hardly likely.

AQUARIUM CONDITIONS — ROCKWORK

There is no doubt that Firefish generally do better in a living-reef aquarium, in the company of other small, unaggressive fish. It is possible to maintain them in a fish-only tank but in doing so it is essential that tankmates are non-boisterous, non-aggressive and approximately the same size. In this way all Firefish will feel secure and unthreatened. Whether living reef or fish-only, it is essential that plenty of rockwork is provided in which to retreat. The

arrangement of small nooks, crannies and cracks afforded by smaller rocks is far preferable to the larger caves, often unavoidable with structures formed of large boulders.

JUMPERS

One trait common to all Firefish is their tendency to leap from an open aquarium. Bullying from incompatible tankmates, or an unexpected disturbance, sometimes results in an upward dash into thin air! The only sure method of avoiding such losses is to cover the tank. However, many reef keepers will, understandably, prefer to dispense with light-inhibiting glass and take their chances with an open top.

WATER QUALITY

While Firefish are rightly popular and common in the trade, maintaining good water quality is important to a long and healthy life. High nitrate levels are tolerated poorly and one of the major causes of disease, tatty finnage and progressive deformities (eg, back-arching). The following parameters are a good guide to optimum conditions:

Ammonia & nitrite: zero;

Nitrates: <5ppm for reef tanks, <20ppm for fish-only; Temperature: 25–26°C (77–79°F) pH: 8.1–8.3; Specific gravity: 1.020–1.024; Dissolved Oxygen: 6–7ppm; Efficient protein skimming and activated carbon filtration as standard; 15–25 per cent water changes every two weeks; Good water circulation is essential. A directional current into which to 'head' is appreciated; Lighting: moderate-intense; Tank sizes may vary from a minimum of 20 gallons nett.

FEEDING

Feeding presents few problems, although special attention should be paid to the size of offerings which must be quite small. Brine Shrimp (live and frozen), Mysis, Lobster eggs, as well as small pieces of Squid, Mussel and Cockle are all attractive to Firefish. Marine flake is greedily accepted by most individuals and should be offered daily as a useful source of vitamins and minerals.

PREDATORS

One of disadvantages of locking yourself into a bolthole is that predators can gain easy access to you. Such

is the case with these fish. If located by a hungry Bristleworm, Crab or Lobster during the hours of darkness, far from fleeing the scene Firefish remain even more steadfastly locked in place only to be eaten alive! Many a specimen has met a grisly demise in this way (much to the confusion of its owner). The only solution is to clear the aquarium of such potential predators before the introduction of any Firefish.

BREEDING

Firefish have not been raised in captivity but we do know that they scatter pelagic (floating) eggs into the current to develop in the plankton layers. There are no obvious external sexual differences.

SPECIES

As we have seen there are only three species of Firefish.

The Firefish
(*Nemateleotris magnifica*) A mostly cream coloured fish blending into burnt umber towards the rear part of the body and fins.

The Purple Firefish
(*N. decora*) An olive-green body set against almost neon purple/crimson fins.

N. helfrichi A rarity in the aquarium trade. Beautiful pink colouration makes this a much sought after species (and extremely expensive!).



'Max' halves running costs for a pond filter pump

New AQUAMAX pond filter pumps from OASE offer a completely different approach to handling polluted water (up to 8mm particle size): High throughput at lowest possible operating pressure ... well under HALF the running costs of submersibles ... long, trouble-free life assured.

Just compare their performance:

Model	Watts	Max. l/min	Max. gph	Max. head
AQUAMAX 5500	75	92	1215	2.5m
AQUAMAX 8000	85	135	1780	3.0m
AQUAMAX 10000	110	150	1979	3.4m



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An aquarium thermometer is an essential piece of equipment for all aquariums and terrariums.

Monitoring the temperature of the water in your animal's habitat is fundamental so that you can maintain the conditions in which your chosen companions can thrive. Not too warm that valuable oxygen is driven out of the water, not too cool that your pets become lethargic and weakened.

To help you in this task Hagen introduce 'Cli-Mates', a co-ordinated range of Digital Aquarium Thermometers suitable for freshwater and saltwater aquariums and also terrariums. There are eight types to choose from including the 'Aquarius', 'Dolphin', 'Meridian', 'Dorado', 'Atlantis', 'Oceanid', 'Minerva' and 'Nova' models. All, with the exception of the 'Nova', display the temperature in both °C and °F. The 'Nova' model displays the temperature of your aquarium water in °F only.

'Cli-Mates' Thermometers have an LCD display that is accurate and easy to read. They mount easily onto the outside of the aquarium glass and can be removed at will, leaving no unsightly glue marks behind. Recommended retail prices are 99p or £1.29 depending on model which are available from all good pet and aquatic retailers.

Further information from: Rolf C. Hagen (UK) Ltd, California Drive, Whitwood Industrial Estate, Castleford, West Yorkshire WF10 5QH. Tel: 01977 556622. Fax: 01977 513465.

New books

Amongst the new offerings from TFH I was delighted to see listed two further books by Takashi Amano following the success of NATURE AQUARIUM WORLD BOOK 1. In Books 2 and 3 he describes and illustrates specific aquatic landscapes made in aquariums up to and over 50 gallons capacity. Each design is discussed and the reasons behind the design are explained. The details of the aquarium support system are also given. As with Book 1 the photographs are quite stunning. The price for Book 2 is £27.95 and Book 3 is £19.95. Whilst I am very impressed by both books the number of plant

BUY LINES

BARRY JAMES' round-up of the latest innovations for your pond and aquarium

fanatics prepared to buy these two further books for nearly £50 for the two must be somewhat limited.

By contrast, HOW TO HAVE A SUCCESSFUL AQUARIUM will certainly sell in far greater numbers. This beginner's book on aquaria is extremely competently put together. It gives all the basic background information on choosing and equipping aquaria and then describes very clearly the processes involved in setting up, furnishing, planting and stocking. It even describes the use of CO₂ in growing plants and balancing the pH. The section on plants and fishes is adequate and describes the most popular types. My only criticism would be that many of the photographs especially of packaged products seems a little superfluous and could well have been omitted or replaced by more meaningful shots. The price is £24.95.

Further information contact: Karen Brown, TFH Publications, The Spinney, Parklands, Forest Road, Denmead, Waterlooville, Hampshire PO7 6AR. Tel: 01705 268122. Fax: 01705 268801.

Colourful bottoms

For aquarists looking for something different in the way of decorative gravels Derbyshire Aggregates Ltd may well provide the answer. Producing a

huge range of aggregates in a wide range of colours. Quartz, Calcined Flints, Shell, Granite, Spa and many other gravels offer potential use in both freshwater and marine aquaria.

Further information: Derbyshire Aggregates Ltd, Arbor Low Works, Long Rake, Youlgrove, Bakewell, Derbyshire DE45 1JS. Tel: 0629-636500. Fax: 01629-636425.

Ultra-violet clarifiers, pumps and filters

Cyprio Ultra-Violet Clarifiers are being re-packaged in a smart new design of box which fully reflects the quality of the product. Stepped Hosetails and a Visual Indicator showing that the long-life lamp is working are features of the design. There are five models serving pools of between 1,000-6,000 gallons capacity. For added safety there

is a cut-off switch to prevent electrical shock if the unit is dismantled whilst switched on. Prices start at £79.95 for the 1,000 gallon model rising to £179.95 for the UVC 6000.

Sales of Pro-Pond filters have exceeded all expectations, says Cyprio Managing Director Malcolm Goodson. "Pro-Pond filters are attracting a lot of interest from commercial concerns as well as hobbyists. We have supplied a multiple system for a Koi pond at a seal sanctuary in Skegness, and several water gardening outlets are choosing Pro-Pond for their large displays. One in the Wirral contains over 45,000 gallons of water and is effectively a small lake, but Pro-Pond will rise to the challenge!"

Launched as recently as May 1996 the Pro-Pond concept has already been enthusiastically embraced by pond owners. To date over £250,000 worth of Pro-Ponds have been sold, and orders are still flooding in from the UK, Europe and the USA. Pro-Pond filters are constructed around three sizes of specially moulded tank at 600, 800 and 1000mm diameter, but all are the same height (one metre). This enables gravity-fed versions to be installed fully in-ground, with or without vortex settlement — uniformity of height makes customising these filter systems very easy.

"Chambers of less than 1m height do not allow proper settlement of solids," says Malcolm.

"Pro-Pond filters are compact and designed to make the best possible use of space, but at the same time they must do all they claim. The dimensions of the chambers reflect this."

Pro-Pond filters offer de-sludging facilities, blanketweed

▶ CONTINUED OVERLEAF



◀ CONTINUED FROM PREVIOUS PAGE

straining and full mechanical and biological treatment of pond water. They all enable fish stocking levels to be substantially increased from the standard 55cm per 1000 litres — in the case of the Pro-Pond Plus, with separate vortex chamber, it can be doubled to 110cm.

With Pro-Pond comes the option of a pump-fed Trickle Biofilter, ideal for densely-stocked Koi ponds. The special design of this unit increases the available population of nitrifying bacteria, without leading to the brown water associated with bacterial sloughing and the waste products from micro-organisms. It goes without saying that all Pro-Pond filters from Cyprio come with the Clearwater Guarantee if used as recommended and teamed with the right size of pump and UVC.

The Company's Prima solids-handling pumps have smart new boxes this season and even greater reliability. This is thanks to the latest hardened stainless steel shaft technology, which substantially reduces wear on the moving parts.

The Prima range of 12 pumps, manual and automatic, caters for garden ponds of all sizes, with flow-rates from 350gph to a thumping 3,250gph. Cyprio maintain that the only way to achieve clear and biologically pure water is to get solids out of the pond and into the filter, and this the Primas do perfectly — the clog-free impeller passes solids from 8-10mm diameter with minimal shearing, to help settle them out before the water reaches the biological stage of filtration.

Prima pumps have a unique range of special features, which include: Built-in thermal overload protection; 10 metres of cable; high energy efficiency (cheap to run); performance rating based

BUY LINES

BARRY JAMES' round-up of the latest innovations for your pond and aquarium

on a 4ft head — not an unrealistic zero head rating; a slow drop-off in performance at greater heads. The two-year guarantee has no wear and tear exclusion clause so unless a Prima pump has clearly been misused it will always be honoured. This makes Prima the natural choice for all pond owners who care about their fish.

Further Information from: Cyprio Ltd, Hards Road, Frognall, Peterborough PE6 BRR. Tel: 01779344502. Fax: 01779 348093.

New era for pond plants

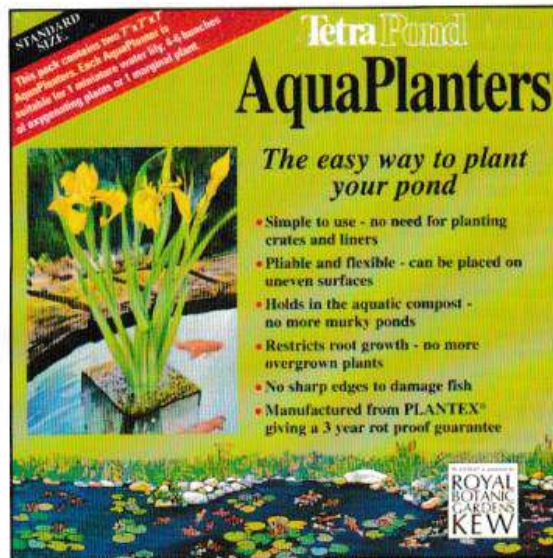
Flexible, strong and easy to use, Tetra's new and innovative AquaPlanters are the ideal container for all pond plants. Manufactured from

PLANTEK — which is endorsed by the Royal Botanic Gardens at Kew, TetraPond AquaPlanters

are simple to use because they dispense with the need for a separate planting basket and liner. The revolutionary material, boasting a three year rot-proof guarantee, holds in the Aquatic Compost, preventing cloudy water but allows water and nutrient exchange to ensure the plants remain healthy. The flexibility of the AquaPlanters allows them to be positioned on uneven surfaces with no risk of them falling over, and ensures there are no sharp edges to damage fish.

Available in two sizes 7x7x7in (RSP £2.99 for a pack of two) and 10x10x8in (RSP £3.99 for a pack of two) the TetraPond AquaPlanters are attractively and informatively packaged.

Information from: Tetra, Lambert Court, Chestnut Avenue, Eastleigh, Hants SO5 3ZQ. Tel: 01703 620500. Fax: 01703 629810.



TetraPond AquaPlanters

The easy way to plant your pond

- Simple to use - no need for planting crates and liners
- Pliable and flexible - can be placed on uneven surfaces
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- Restricts root growth - no more overgrown plants
- No sharp edges to damage fish
- Manufactured from PLANTEK® giving a 3 year rot proof guarantee

STANDARD SIZE. This pack contains two 7x7x7 AquaPlanters. Each AquaPlanter is suitable for 1 container water lily & 4 bunches of appropriate plants or 1 marginal plant.

ROYAL BOTANIC GARDENS KEW

How 'Max' takes the pressure off handling polluted water

OASE's new AQUAMAX pond filter pumps offer high throughput (up to 150 l/min. or 1979 gph) at lowest possible operating pressure, which in turn means less than HALF the energy requirements of submersibles and longer trouble-free life in handling polluted water (up to 8mm particle size).

Features are the stainless-steel-housed split-shaft motor, the 'chopping' action of the completely new twin-blade impeller and the extra-large strainer which totally encloses the pump — reducing cleaning frequency.



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Focus on KOI

The most obvious starting point is Sanke and Showa. Many people find these two varieties very difficult to tell apart as they both consist of



Sanke are described as having a white base pattern. Showa's are traditionally described as being black Koi with a white and red pattern. The immediate differences you will note is that the black colour is more predominant especially in the base of the fins and on the head area. You will

the same colours red, black and white.

Let us start with the Sanke (Photo 1). Sanke have a white base with a red and black pattern. The Red colour is known as 'Hi' (pronounced he) while the black pattern is called 'sumi'. The white base should be as snowy as possible, as this example shows, while the hi pattern should be evenly spaced from head to tail and either side of the dorsal line. You will notice on this Koi that between the head and the dorsal is a large area of the white base showing. While not a major demerit an extra piece of hi would make this Koi even more desirable.

The sumi pattern you can see is evenly spaced (head to tail/side to side) and has the style of small patches over the entire body as is typical in a Sanke. You will also notice the distinctive stripes in the pectoral fins and the lack of sumi on the head, also a classic Sanke pattern. The hi pattern on the head should extend over the crown of the head but it is preferred by the majority of hobbyists that the hi should not cover the eyes or extend right down to the nose but leave a white tip as it does

perfectly in the photo.

Next we move on to Showa (Photo 2). Immediately you can see there are significant differences although these two Koi are the same colours the style of the pattern is different. Where

notice that this Koi has a charming black nose. Almost without exception Showas have black on the head, especially around the mouth and eyes often in the form of 'Y' shaped patterns or stripes from top of the head to the nose.

The pectoral fins are different from Sanke as well as you can see the black is solid and not striped (known as motoguro). But it is the shape of the sumi patches which give the biggest clue to whether a Koi is a Sanke or Showa (see Photo 3). Here we have a Sanke and Showa next to one another. And you can immediately see that the sumi (black) on the body is a different shape. On the Sanke we have small even patches, while on the Showa the sumi wraps around the body from belly to dorsal. The red pattern on the Showa is very similar to that of the Sanke and can consist of a stepped pattern (as in Photo 2) or consist of hi from head to tail but it should always be balanced along the body of the Koi.

These differences in style can be seen quite clearly on the Tancho (Photo 4). (Tancho describes the red Hi spot on the head. If a Koi is a Tancho it has no other hi on the body so a Koi with a red spot on the head and red on the body is called a Maruten Sanke. The sumi on the side of the head on the Tancho Sanke is not like the black on the Showa's head — it is a rogue piece of sumi pattern in a patch unlike the deep rooted sumi on the nose of the Tancho Showa.

Moving away from Sanke and Showa other three-coloured Koi include the Aigoromo (Photo 5). Ai means Blue and Goromo means robed. This Koi has a white base pattern and a hi pattern of a Kohaku but it is overlaid with a blue edge to every scale on the red pattern only.

Photo 6 illustrates a very impressive Kujaku. This means peacock. Kujaku are metallic Koi which have a silver base with a red/orange metallic pattern, in this case a straight hi pattern from head to tail while each of the scales has a black centre also known as a matsuba or pine-cone pattern. The Doitsu Kujaku has very few scales, only along the dorsal

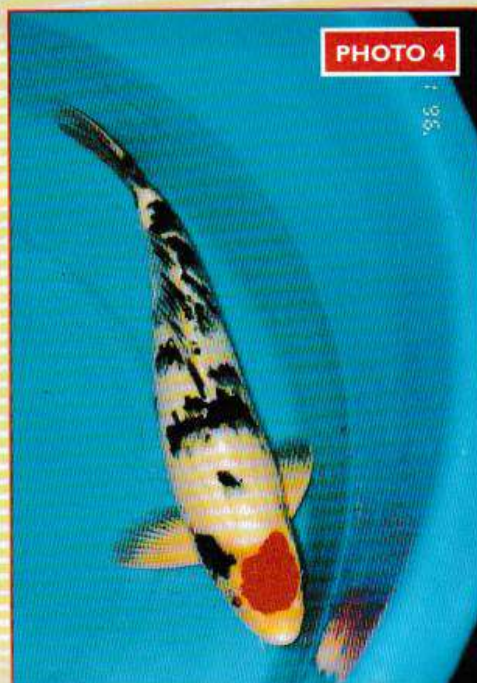
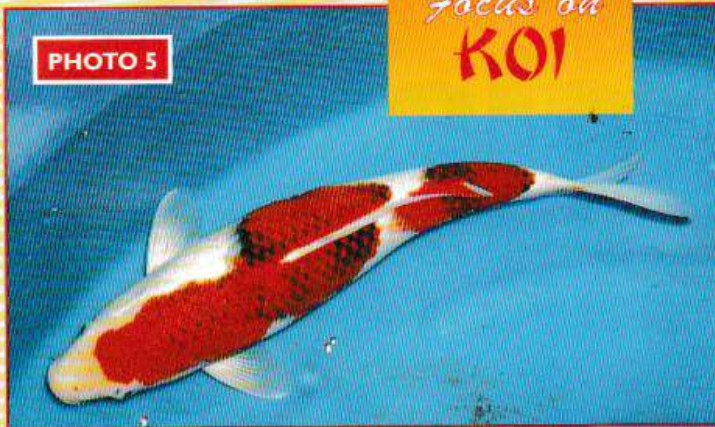


PHOTO 5



Focus on
KOI

As you can see in our quick romp through three coloured Koi although the colours can be the same the style of the patterns is diverse and makes Koi keeping the interesting hobby that it is.

fin and the lateral line and therefore the black part of the pattern is much diminished.

This is also the case in the situation of Asagi and Shusui. It is the only one in all the varieties where the scaled and the Doitsu examples of the same Koi have totally different names. The basic pattern is the same.



PHOTO 6

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ALGAE CONTROL AND PLANT PESTS

SUSAN STEPHENSON OFFERS HELP IN DEFENDING AQUATIC PLANTS AGAINST SEASONAL ATTACKS

PHOTOGRAPHS BY THE AUTHOR

There is nothing more likely to break the heart of the ardent pondkeeper than to find their pond plants invaded by pests or the pond by algae. Controlling them is a problem because the pond is a delicate environment in which the balance can easily be upset because it is highly sensitive to chemicals.

Algae are primitive filamentous plants which

from a green scum or threads in the water and can choke a pond depriving it of vital oxygen and light if left unchecked. There are over 100 types. Some are unicellular (single-celled) plants and free-floating whilst others form filaments of cells linked together to form threads and cotton wool-like masses. These forms are commonly known as blanketweeds. Most algae are vigorous and robust and therefore require some

control.

Algae spread from pond to pond on carriers which may be Frogs, Newts or introduced fish.

Considering it only takes a few cells of algae to begin growth it is no wonder that most ponds suffer from algal population explosion from time to time.

Large masses of filamentous algae can be removed using a long stick to 'wind' the algae up and remove it as a mass and this

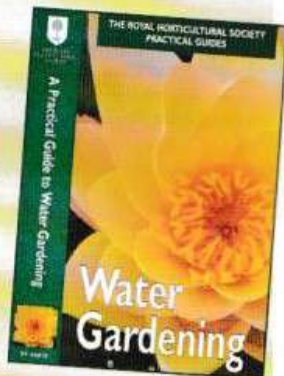
can work effectively in larger ponds or where the algae remains concentrated in one place but where the algae is dense or has produced a scum all over the pond then more rigorous controls are needed.

Encouraging a healthy population of scavengers such as Water Snails can be quite effective at keeping algae down to manageable levels but you need to ensure that the population of snails does not reach



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VIDEO REVIEW

Royal Horticultural Society Practical Guide — Water Gardening. Presenter: Barbara Davies, Stapeley Water Gardens. Produced by Two Four Productions, Quay West Studios, Old Newnham, Plymouth PL7 5BH. Tel: 01752 345424. Fax: 01752 244224. Price: See Special Offer to A&P Readers

Installing a pond, or even a water feature, can be quite daunting for many people and a helping hand is always welcomed. In this case the help doesn't come in the shape of physical assistance but a fact-filled and 'how to do it' illustrated video. Produced by Two Four Productions, in association with Stapeley Water Gardens, it will allay any previous fears, doubts or worries you may have about attempting to install a pond. In fact, once seen, it may well persuade you to upgrade your original ideas — you have been warned — such is the visual impact of the designs and plants available. Beginning with a simple pot water feature, Barbara Davies puts you instantly at ease with an easy, but assured manner. Plenty of close-up details shows all the techniques and handy tips. There is no need to worry about technical terms — there aren't any,

except for the superimposed scientific names of the aquatic and marginal plants. It is fair to say that this video is aimed at approaching water gardening from the gardening angle (hardly surprising considering the RHS connection) but it does mean that attention to fish-related details may appear to be sparse, although the two main problems associated with ponds — Green Water and Blanketweed — are given very adequate coverage. You will get many ideas from viewing this video, it will certainly whet your appetite for introducing water into your garden (on any scale from hanging baskets, sunken sinks, patio-based pots to fully-finned ponds cascades and waterfalls). The selection of plants is very comprehensive and fortunately the whole recording venture appeared to have been blessed with the most amazingly good sunshine! You will find the plant details an easily-accessible source of reference and you can easily plan and modify your pond's planting simply from the comfort of your armchair. Sit back and enjoy, then get out and start digging! The video is available in standard VHS form (PAL for UK) and also in NTSC for other countries (at a slightly higher price). Running time is 60 minutes.

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KATHY JINKINGS HAS ROUNDED UP SOME OF THESE UNUSUAL FISH FOR YOUR CONSIDERATION

PHOTOGRAPH BY MP & C. PIEDNOIR

A GAL FRESHWAT

Many a new aquarist, while browsing through the ranks of Neon Tetras, Guppies and the other staple fare of the local aquatic shop, has encountered a little snub-nosed fish, resplendent in black and yellow stripes, and has bought this fish as 'something different'. This is the Bumblebee Goby, which is often the first and last Goby that many people keep. The new purchase is carried home and installed in the freshwater community tank, where it removes the fins from all the Guppies and, after a brief life plagued with fungal infections, dies. After this experience, Gobies go on to the aquarist's mental 'difficult' list. This reputation is totally unwarranted — there are many species of Gobies of all shapes, colours and temperaments, which will all thrive and usually spawn in freshwater. No matter what type of set-up you have chosen there is a freshwater Goby that will settle in and provide hours of amusement by their antics.

The sub-order Gobiodei is usually divided into three groups, of which only two are of interest to non-specialist aquarists. The third

group is the Mudskippers, which although fascinating fish are not suitable for either freshwater or a standard tank set-up, and should be left in the shop. The Gobies we will be looking at are the true Gobies, the Gobiidae, and the Sleeper Gobies, the Eleotridae.

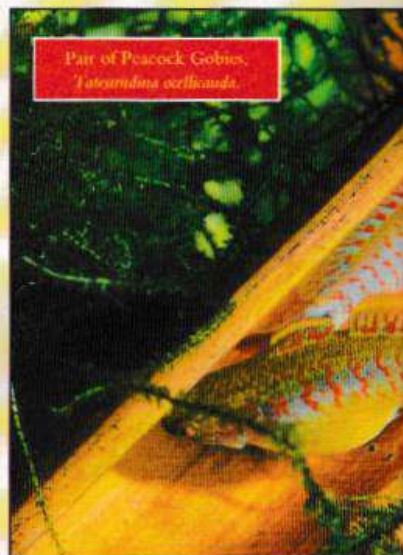
True Gobies are bottom-dwellers from fast flowing waters, and need plenty of oxygen. They have coped with the need to cling on to rocks by developing a 'suction cup' created by the fusion of the pelvic fins, and in the aquarium will often be seen clinging on to the glass. In the aquarium they are both comical and endearing in the way they 'bound' over the gravel in a most un-fishlike way, only venturing into midwater to snatch food at feeding time. The Sleeper Gobies are, in general, larger fish, and swim in midwater.

Many Gobies spawn easily in the aquarium, even in a community, and the parental care provided by the male is fascinating to watch. Goby eggs are typically stuck firmly to a secure surface by a little 'stalk' which eventually becomes the 'tail end' of the fry. It is often quite difficult to decide whether the Goby eggs have hatched or not, as the fry are

mobile when very immature with large yolks remaining. At this time they look like slivers of glass attached to balloons and, although they are able to move, will remain in position on the surface where they hatch for a day or so if undisturbed. In most species the male tends the eggs constantly, fanning oxygenated water over them and chasing off intruders. He will rarely eat at all while guarding the eggs — since Gobies are very prolific spawners the male has to eat all he can in the brief periods while he has no eggs. The eggs fungus very easily without the male's care, as it is very difficult to supply the required oxygen to them without detaching them from the surface. However, the male is so dedicated that in most cases the eggs can be safely left in a community aquarium until the day they hatch. Fortunately, this is very predictable, and provided your aquarium remains at a constant temperature the

eggs can easily be removed 'just in time'. While the fry are all clinging together they are still very vulnerable to fungus, which can sweep through an entire spawn in less than a day, but treating the water with a fungicide normally sees them safely through this sensitive period.

Once the fry are free swimming, or leaping around the bottom in the case of the true Gobies, most species will take Brine Shrimp nauplii immediately. It is easy to tell if they are ready to feed; by adding a



Pair of Peacock Gobies, *Tatostomina ocellifera*

few nauplii to the tank you can immediately tell if they have been eaten by the bright-orange bellies of the fry — at this stage they are

feedings of live or frozen food are given. The fry especially will simply starve if not given Brine Shrimp to start off with. They grow

can survive and remain healthy in extremely hard water they are unlikely to spawn, and will always be prone to fungal infections.

nooks and crannies where the fish will spawn regularly. As males will fight during spawning, a trio of two females and a male is a good choice.

A OF ER GOBIES

PART 1



quickly though, and can rapidly be moved on to frozen Daphnia, Tubifex and Bloodworm. The fry will eat Bloodworm at a surprisingly small size, but it may take some while before the end of the worm joins the beginning in the Goby's stomach! Flake food should be given occasionally though from a young age, so that in an emergency the Gobies will eat dry foods. Larger Gobies will eat small fish, and

should never be kept with anything that will fit into their remarkably wide mouths.

BRACKISH WATER GOBIES

The Bumblebee Goby is often, as I have mentioned earlier, one of the first casualties of the beginning aquarist, but is a cute and amenable little fish when kept correctly. They do need to be kept in brackish water, and although they

For this reason they are outside the scope of this article other than to reiterate the warning against buying them — yes, they are pretty, but so are many of the Gobies that will enjoy life in your freshwater tank. The range is big enough for you to find one without keeping the poor little Bumblebee in conditions he was not designed for.

Another fish that often appears in dealer's tanks is the Knight Goby, *Sadanumdio stigmatus*. This attractive fish is another brackish water species. Unless you are prepared to keep water quality faultless, keep constant vigilance against fungus, and have short-lived fish anyway, go for a true freshwater Goby — there's plenty to choose from!

GOBIES FOR THE SMALL COMMUNITY TANK

The following two Gobies are peaceful, attractive and endearing fish, who will quickly settle into a small, quiet community aquarium. The tank should be planted to give them some cover, and should have rocks and slates to provide

A PEACOCK FOR YOUR TANK

The Peacock Goby, *Tateumдина ocellicauda*, lives up to its name with beautiful pink and blue colouring — this spectacular fish is not only one of the prettiest Gobies, but one of the prettiest of aquarium fish. As a midwater swimmer it is always on show, and its exotic looks belie its uncomplicated requirements. It originates from ponds and rivers in New Guinea, and unusually for the Goby family prefers soft water, although they will adapt to harder water. The temperature should be between 72°F and 79°F.

The males are easily identified as having a much blunter, rounded head than the females, while healthy females should have a well rounded belly. Growing to a maximum of 3in they are suited to a 3ft community, although a smaller tank could be used as a species tank. They are gentle, quiet fish, who will soon become harassed and die if kept with aggressive or over-boisterous fish. A quiet, calm tank will ensure that they are seen to their full advantage and remain happy and healthy.

When spawning the fish clean a firm surface to lay their eggs, preferring tight nooks and crannies in rockwork, although they have been reported as spawning in plants. Often the only sign that the Peacocks have spawned is the disappearance of the male — after a few days the search for the corpse will often find him guarding a spawn. They are good at finding hidden places, and often a male presumed dead after a thorough search of the tank will reappear from

still colourless. Although they can be reared on gravel they are tiny and tend to wedge themselves into crevices in the gravel — a bare bottomed tank makes it easier to enjoy seeing your brood grow up, and ensures that they are able to move around easily and catch all the food.

All Gobies are carnivorous by preference. Although most will take flake food if they are really hungry, and many will eat it quite happily, they will never be truly happy and healthy unless regular

TROPICAL A Gala of Freshwater Gobies

nowhere after a week.

The fry are very susceptible to dirty water, and regular water changes in the fry tank will produce the best results.

A COMMUNITY CHARACTER

The Dragon, or Red-throated Goby, *Rhinogobius uni*, will rapidly become a firm favourite in any community tank of small fish. Although not normally spectacularly coloured (although the male can be impressive before spawning) these fish encourage anthropomorphism, and it is easy to attribute a real 'personality' to them. Typical true Gobies they prefer not to swim in midwater, but often find themselves perched at the top of plants or on rocks. From this vantage point they play 'king of the castle' with challengers attempting to chase the current incumbent

off, but they are not really territorial, and the 'king' will eventually lose interest and wander off to another part of the tank.

When ready for spawning the male darkens from dull brown to a deeper chocolate colour, and the red and white edgings to the fins become much more obvious. He begins to patrol the tank displaying to any other Goby encountered by inflating his red throat and throwing his head back to display the red to advantage. When he has impressed his fellow residents enough he starts to construct a nest site under a flat stone. Painstakingly, he lifts pieces of gravel and spits or carries them out of the way, until a hollow has been excavated under the stone. One of the

females will then join him under the stone, and a batch of between 10 and 50 large eggs are laid on the roof of the cave. The female then leaves, and the male blocks up the hole so that he is sealed in the cave with the eggs. If you have not been watching the proceedings, often it is very difficult to locate him.

Occasionally, if more than one female is kept in the same tank, the cave will be opened again to allow a second batch of eggs to be laid underneath. If the stone is prised up to examine the eggs they will be seen to show the black dots of eyes very quickly, within four or five days, but the fry do not hatch until the 15th day (at 75°F this may vary with temperature changes). If

they are removed at this time, still adhering to the rock, the male spends some time searching the area, as though unable to believe that they have disappeared. I have seen my male Dragon Goby still regularly digging where the stone was two days later.

These fish prefer harder water, and because they spend most of their time at the bottom are not worried by their tank mates. Although they should not be kept with anything too large, as they only grow to 2in, they are unperturbed and unbothered by most of their neighbours. They do require a lot of oxygen, and will do best with a strong current.

TO BE CONTINUED

Kathy Jinkings runs the British Aquatic Resource Centre website on the Internet. You can pay a visit on jkc@jkc.demon.co.uk

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CREATING A SMALL WATER FEATURE

RICHARD BRADLEY PRESENTS A SIMPLE STEP-BY-STEP GUIDE

PHOTOGRAPHS COURTESY OF HOZELOCK UNLESS OTHERWISE STATED

Self-contained indoor water features are becoming an increasingly-popular addition to the aquatic hobby: the sight and sound of running water provides a perfect complement to an indoor setting such as a conservatory or dining

room. With better-designed, safer, and less expensive equipment being available the option is open for people to enjoy a self-contained water feature as an extension to their existing aquatic interests.

A small water feature can be assembled in just a few hours using a planter, stones, and a miniature water

pump, and designs can be floor-standing, wall-mounted, or even table-top now that the size and cost of the smallest pumps has been drastically reduced.

There is a myriad of designs available from aquatic retailers which require you only to add water and to plug into the power supply, while, for the

practically-minded, the simplest self-contained water feature can be made in a relatively short space of time.

All that you require is a large planter — I chose one which is approximately 45cm (approx 18in) in diameter and roughly 25cm (approx 10in) high; a water-lily planting basket just large



PHOTO: STEPHEN J. SMITH

WRASSES COMP

Wrasse belong to a large family of fish, the Labridae, that comprises over 400 species. The species below have been chosen to demonstrate this wide variation. Wrasse

often show a different colouration between juvenile and adult fish, in addition many species exhibit sex reversal. Some species will spend the night buried in aquarium



CUBAN HOGFISH:
Bodianus pulchellus

SIZE: Up to 10in and is sometimes available as large specimen fish of 6-in. Can reach 10in in the wild.

ORIGIN/AVAILABILITY: Western Atlantic and Caribbean. Not the most common of fish, possible because they command a high price. They can often be seen in a wide range of sizes from small 3in specimens to large, almost adult size fish.

AQUARIUM NEEDS: Because of its potential adult size, and active nature, a large tank is required. This robust fish should not be housed with timid tank mates. Juveniles will act as cleaners. Bold feeder on a diet of crustaceans. Will readily take to an aquarium diet as its wild diet can easily be accounted for with the large range of commercial frozen foods available.

COMPATIBILITY: A peaceful fish but as with most marine fish it will not tolerate its own relatives or similarly-coloured or shaped fish. Very small tank-mates may not be safe with a large specimen, who just might decide they are a

tasty tit-bit. Hogfish cannot be kept with invertebrates.

HARDINESS IN CAPTIVITY: Most references list this as hardy specimen. Personal experience suggests smaller specimens will adapt more readily to the aquarium.

SIMILAR SPECIES: Spanish Hogfish, *Bodianus rufus*: A species with even larger potential for growth (up to 24in in the wild) although it is usually seen for sale as juvenile, 3-4in specimens. Similar in behaviour to the Cuban. The juvenile is predominantly yellow with a blue/purple colour along the upper body. Adults are much more similar to the colouration of the Cuban.

CLEANER WRASSE: *Labroides dimidiatus*

SIZE: Usually available as 2-3in specimens. Grow up to 4in in the wild.

ORIGIN/AVAILABILITY: Widespread throughout the Indo-Pacific. A very

common and popular fish within the hobby, but as we will see later it pays a high price for its popularity.

AQUARIUM NEEDS: The fish is so called because of its cleaning activities, both in its natural habitat and in captivity. The Cleaner will approach a fish, the subject fish will then remain stationary allowing the Cleaner to go about its business of picking parasites from its skin and

gills. In captivity it will 'apparently' adopt to a diet of fine particles of meat-based foods. The Cleaner will readily carry out cleaning duties within the aquarium although it will obviously only find a limited number of parasites. Occasionally some fish do not seem too keen on being cleaned. I have seen 'armour-plated' species, such as Puffers and Boxfish, driven to distraction by the persistence of the Cleaner Wrasse.

COMPATIBILITY: A peaceful fish that is also safe

with invertebrates.

HARDINESS IN CAPTIVITY: Herein lies the problem of a fish that at first glance seems ideal for an aquarium. A well-known dealer once confessed that he estimated that 90 per cent of all the Cleaner Wrasse he sold were dead within six months. This was such a problem that he stopped supplying them.

SIMILAR SPECIES: The Sabre Tooth Blenny (*Aspidontus taeniatus*) also known as the False Cleaner Wrasse mimics the Cleaner Wrasse in shape, colour and behaviour. However, all similarities end when it takes a bite from its subject instead of removing parasites. Therefore it cannot be kept with other fish.

SUMMARY: My own experiences suggest the dealer was correct, this is a fish with a very short life-span once in captivity. It has been suggested that it never truly adapts to an aquarium diet. Therefore, once it has run out of parasites, it slowly wastes away, over a few months. Personally I feel this species should not be imported.



ARA-FILE

DAVE GARRATT provides a Compara-File overview of this popular Family of Marine fishes

sand, hence this must be provided for in an aquarium housing such species.

The section headed 'Hardiness in Captivity' contains

information of personal experience based on, not just my own, but the experiences of many aquarist friends over the years.

HARLEQUIN TUSKFISH:
Lienardella fasciata

SIZE: Can reach a size of 24in in the wild. Has the potential to grow very large in the aquarium reaching up to 14in, although I have never seen one above 7-8in in dealers' or hobbyists' tanks. Usually available as 4-6in specimens.

ORIGIN AND AVAILABILITY: Indo-Pacific and Australian Barrier Reef. The Tuskfish, although not rare, is only seen occasionally in dealers' tanks, probably because of its high price.

AQUARIUM NEEDS: Because of its potential growth and active nature the fish requires a suitably large aquarium of at least 60 gallons. It will adapt quite readily to a meat-based diet, eg, Mussel, Squid and Shrimps.

COMPATIBILITY: Despite a set of menacing teeth this is a peaceful fish ideally suited to a community tank of larger species. Its activity makes it an ideal addition to a tank of sluggish predators. It can also be kept with smaller fish but not with anything small

enough to be swallowed! It cannot be kept with invertebrates.

HARDINESS IN CAPTIVITY: Most authorities list this fish as fairly hardy once established and feeding well. It is not, however, a beginner's fish and like most marine fish it will require excellent water conditions in an established tank. I cannot make personal recommendations as I do not know enough hobbyists who have kept a Tuskfish (all my friends must be too poor!).

SIMILAR SPECIES: The only fish of its species seen within the hobby. The Barrier Reef specimens differ from those of the Phillipines area by having a blue edging to the red stripes and by having blue teeth.

SUMMARY: A truly spectacular, active, peaceful, show fish that would grace any tank (invertebrate tanks



excluded).

PYJAMA, OR SIX-LINED, WRASSE: *Pseudochelinus hexataenia*

SIZE: A small Wrasse that only reaches 3in whether in the wild or in the aquarium.

ORIGIN/AVAILABILITY: Indo-Pacific. Very common, seen on a regular basis in dealers' tanks.

AQUARIUM NEEDS: A relatively hardy fish presenting the hobbyist with no problems or special needs, other than the usual ones demanded by any marine fish, ie, excellent water quality and aquarium maintenance. Will easily adapt to take many frozen and flake foods.

COMPATIBILITY: Peaceful, except to its own or similar species, with which it would fight. Ideally suited to an invertebrate set-up, proving a popular addition to many reef-tanks.

HARDINESS IN CAPTIVITY: This Wrasse again demonstrates its suitability for a tank that contains invertebrates, due its relative resistance to disease.

SIMILAR SPECIES: There are other species in this genus, commonly called the Three-line and the Eight-line Wrasse, but they are rarely seen for sale. Other more common, hardy, small, peaceful Wrasses belong to related genera, eg, *Halichoeres chrysus* and *H. trispilus*, both known as the Banana Wrasse.

SUMMARY: Small, peaceful, hardy, inexpensive, what further attributes could a marine fish possess to make it an ideal beginner's fish?

KEY TO PICTURES

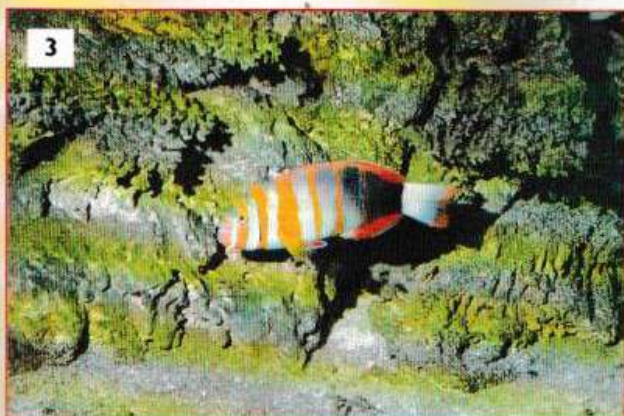
1 CUBAN HOGFISH: *Bodianus pulchellus*.

2 CLEANER WRASSE: *Labroides dimidiatus*.

3 HARLEQUIN TUSKFISH: *Lienardella fasciata*.

4 PYJAMA, OR SIX-LINED, WRASSE: *Pseudochelinus hexataenia*.

PHOTOS 1 TO 3: A&P LIBRARY PHOTO 4: NICK DAKIN



Jackie's Juniors



Hi, Junior Fishkeepers, it's time for your column again. I was really pleased to receive a letter from Bethyn Barrass including a picture of her aquarium. Bethyn says she reads JJ every month and solves the puzzles — if she can! Thanks for the picture, Bethyn. I liked the idea of a cave for your fish to shelter in and the two Eels certainly looked as if they are enjoying the air bubbles rising up.

This month I've given you some reading as well as a puzzle — I've unearthed a couple of things you might find interesting — and of some use.

WORD SEARCH

H	B	S	F	L	O	N	E	S	O	T	Z
S	C	O	T	I	T	E	L	R	L	P	C
I	T	A	G	H	E	A	T	E	R	P	L
F	I	E	D	W	G	R	A	V	E	L	F
L	R	C	N	A	O	I	E	B	P	E	O
E	Y	C	O	T	L	O	L	T	X	C	O
G	U	P	P	Y	D	W	D	M	L	O	D
N	M	H	S	I	F	T	A	C	Z	I	T
A	L	K	A	L	I	N	E	T	C	A	F
P	L	A	N	T	S	F	I	A	E	J	O
H	Z	K	R	A	H	S	T	P	O	R	Y

WORDS TO FIND

ACID	FILTER	HEATER	PLECO
ALKALINE	FOOD	LIGHTS	POND
ANGELFISH	GRAVEL	NETS	SHARK
BOGWOOD	GOLDFISH	PEAT	PEAT
CATFISH	GUPPY	PLANTS	WATER

HOZELOCK COMPETITION WINNERS

A Hozelock Super Cascade 2000LV Pond Pump will be on its way, direct from Hozelock, to each of the following winners in our Hozelock Competition (A&P, March 1997).

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T. E. Critchlow, 34 Whernside Way, Leyland, Lancashire PR5 2ZN

C. Clifton, Woodcotes, Brackenhill Road, East-Lound, Haxley, Doncaster, South Yorkshire DN9 2LR

A. Guthrie, No 3 Cottage, West Herdhill, Kirriemuir, Angus, Scotland DD8 5LJ

WHAT'S IN A NAME?

OK, so you're called all manner of nicknames at school by your mates, more properly by your forename or surname by teachers and maybe a pet family name at home. As far as we're concerned our names are passed on by common usage or found in the telephone book and in our Birth Certificate. At least, if anyone asks, we can answer for ourselves but for animals there are other registers of names. Dogs and Horses may have their birth details carefully recorded in long lists of pedigree names but although fishes haven't yet got into such dizzy heights their names are still found in formal listings, usually referred to as Classifications.

Whilst everything living can be listed accurately in exactly its precise point in the grand scheme of things on a seemingly never-ending list of groupings, we refer to our fishes' real names by almost exactly the same way as we call each other — except that we reverse surname and surnames.

Each of our fishes (and plants, too) are classified into a two-part naming system — Genus (our surname, for example) and Species (our forename). Just as there may be many Smiths, differentiated by Berts, Freds, Johns, and so on, so we have Corydoras divided up into, say, aeneus, paleatus, schultzi, etc. The species, which is a single unit, may be further divided into sub-species.

Of course there have been mistakes made and these are generally rectified by reverting to the earliest name (which always takes preference) allocated to the animal. When writing scientific names down the genus name always begins with a capital letter, the species name always with a small letter.

Just in case you're thinking that this is all modern stuff, the two-name, or binomial, system was invented by a Swedish man called Carl von Linné (his name has also been Latinised into Linnaeus) as far back as 1758.

WHAT'S IN AN INITIAL?

With modern books trying to cram more and more information into smaller space, the use of abbreviations is very common. In many books parts of the fish, particularly fins, have been reduced to a single letter in some cases. For example, a male Swordtail might be described as 'having a long-based D, plus a modified A. TL much longer than SL due to lower extension to C.'

To help you work out what is what, here is a little reference list:

A = Anal Fin; C = Caudal (tail) Fin; D = Dorsal Fin; D1 = First Dorsal Fin; D2 = Second Dorsal fin (maybe adipose fin); P = Pectoral Fins; V = Ventral (pelvic) Fins; LL = Lateral Line; SL = Standard Length (nose to end of caudal peduncle); TL = Total Length (includes caudal fin)

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

A couple of weekends ago I attended my first 'event' of the Koi 'summer'; the Shirley Aquatics Tategōi Weekend (see photographs overleaf). I arrived fairly early on the Saturday morning so that I would be able to get a good look at the Koi on offer. I was not, however, the first to arrive. Several people were already surrounding the pond containing the new Koi and were eagerly trying to spot the one to buy that was going to win them a trip to Japan next year! The weekend was supported by representatives of Phoenix 2000, Bio 2000 and Sequence pumps.

The following day I went to the BKKS Annual General Meeting where, amongst other AGM type things, a new Chairman was elected. I am sure all members will wish to thank Gary Prichard for his leadership in recent years and offer Alan Rogers our best wishes for his term in his new post.

This is the month when some of our Koi will be competing for honours in the first show of the year.

The International Koi Show is being held in Luton and promises to get the new season off with a swing.

A wonderful collection of Koi should be on display for the visitor to view and a host of dealerships will be attending with their new ideas and products for us to see and buy. I always look forward to these shows because I am always putting new faces to names and meeting readers with whom I correspond or phone from time to time.

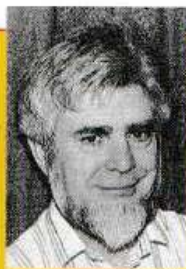
Three other shows to pick from this month in different parts of the country so I hope that this current spell of warm weather continues so that Koi, exhibitors and visitors alike are all able to enjoy themselves at these wonderful events.

Koi Shows in 1997

MAY

3/4 International Koi Show (UK). Luton. Contact D.J.'s Koi on 01922 493290 or Fax 01922 710191.

10/11 Norwich Section BKKS. 1st Open Show in the Exhibition Building of the



DAVID TWIGG'S KOI CALENDAR

Royal Norfolk Showground, Nr. Norwich. Further details contact Glyn Bowman 01328 851695.

25/26 Merseyside Section BKKS. Open Show at Camphill Park, Hillfoot Road, Woolton, Liverpool. Contact Bob Pearson on 0151 7338494.

25/26 South Hants Section BKKS. South Downs College. Contact George Rooney on 01420 473169.

JUNE

7/8 Worthing & District Section BKKS. Open Show at Worthing Rugby Club, Roundstone Lane, Angmering, West Sussex. Contact Mike Gunn on phone/fax 01903 763493.

21/22 Kennet Valley Section BKKS. Open Show at Donnington Grove Country Club, Newbury, Berkshire.

28/29 Middlesex & Surrey Borders Section BKKS. Open Show. Kempton Racecourse. Contact Dave Webster on 0171 382 8003 or 0181 648 0848.

29 Lower Thameside Section BKKS.

JULY

27/28 East Pennine Section BKKS. Open Show. Wentworth, South Yorkshire.

AUGUST

9/10 British Koi Keepers Society National Show Koi '97. Open Show at Billing Aquadrome, Northampton.

30/31 Ireland Section BKKS. English Style Open Show. Hillmount Nursery, Upper Braniel Road, Gilnahirk, Belfast. Contact Trevor Geary 01232 546002 (office) or 01247 466865 (home).

SEPTEMBER

6/7 South of England Koi Club (ZNA). 3rd Open Show (Japanese Style) at Botley Park Hotel & Country Club. Contact Tony Price on 01705 261085.

13/14 ZNA North of England Chapter. 2nd Open Show (Japanese Style) at Avesta Sports and Social Club, Bawtry Road, Sheffield. Contact John Timmis on 01226 289507.

OCTOBER

18/19 East Pennine Section BKKS. 1st Autumn Open Show. The Heritage Centre, Elsecar, nr Barnsley. Completely indoors. Contact S. Sanderson, 92 West Street, Hoyland, Barnsley S74 9DJ.

Koi Meetings in May

4 Avon Section BKKS. Coach trip to International Koi Show at Luton. Contact Sandra Lane, on 0117 9491061.

7 Leicestershire Section BKKS. Pond Plants. Kirby Muxloe Sports Club. Contact Ray Dunkley, 0116 2771600.

12 Northants Section BKKS. Meet at Saints Sports and Social Club, Northampton. Contact Albert Day on 01604 407361.

14 Nottingham & District Section BKKS. Contact Shirley Hind on 0115 981 0923.

14 South Hants Section BKKS. Denis Carter explains 'Final Show Arrangements'. Denmead Church Hall. 8pm. Contact George Rooney on 01420 473169

14 Merseyside Section

BKKS. AGM at Broadway Country Club, Norris Green. Contact Alan Findlay, 0151 284 5973.

18 Northants Section BKKS entertain Wirral Section BKKS. Contact Albert Day on 01604 407361.

18 Northern Koi Club. Meet at George Carnall Leisure Centre, Urmston, Manchester. Contact Tony on 0161 794 1958.

24/25/26 Northern Koi Club. Bank Holiday Weekend trip to Belgium. Contact Tony McCann on 0161 794 1958.

25 Northants Section BKKS. Dealer trip to Koi Water Barn & Nishikigoi Centre. Contact Albert Day on 01604 407361.

25 Crouch Valley Section BKKS entertain members of Heart of England Koi Society at their ponds. Contact David Twigg on 01926 495213.

All Koi keepers are welcomed to the events mentioned in this Calendar (an entry fee may be payable) and further details can be obtained from the contact telephone number quoted alongside the diary entry. My thanks go to all Koi Club Secretaries or PROs and others who send me their latest calendar for inclusion in this column. If your club is not mentioned and you would like it to be, please write to me via the Editor at MJ Publications Ltd, Caxton House, Wellesley Road, Ashford, Kent, TN24 8ET. Although I do my best to ensure all events are mentioned it may be that some information, which arrives a little late, misses my deadline. To minimise the chance of this occurring you may find it more convenient to fax me direct on 01926 403500. This request also applies to dealers with special events, auctions, etc. I look forward to hearing from you.

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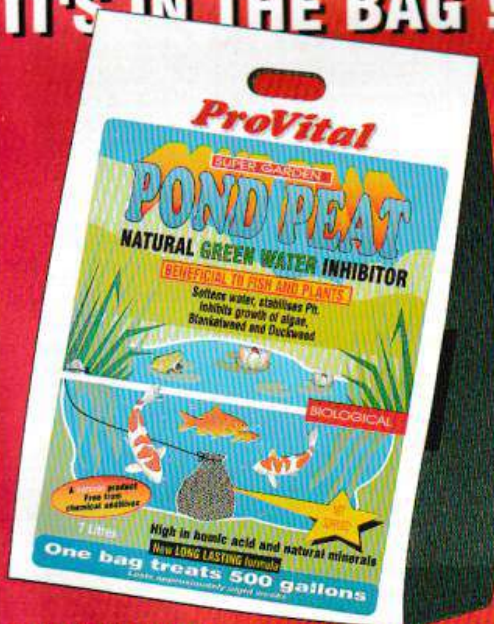
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LONDON



For thousands of people this year's Easter event was not so much the traditional Easter Parade as much as the Easter Scrum on the South Bank of the Thames at County Hall, opposite the Houses of Parliament, where London's newest attraction — the London Aquarium — is located. Around 5,000 fish-fancying people waited in the very cold breeze (but thankfully sunshine) to view the exhibits — one delaying problem was that only a maximum of 1,500 people are allowed into the Aquarium at any one time, so most of the waiting crowds were facing some lengthy delay.

Built on three floors (all below ground) the aquarium has two major exhibits — the Atlantic and Pacific ocean displays — which can be viewed at all levels. Huge sculpted replicas of the famous Easter Island Head Statues decorate the Pacific display and these provided an unusual yet apt accompaniment to the Sharks and other marine fish gliding all around them.

Tropical habitats familiar to aquarists form major parts of the rest of the 41 exhibits — Amazonia, complete with Piranhas, Rain Forest, Coral Reef and Mangrove Swamps (watch out for the spitting Archerfish!) — whilst temperate zones such as the Mediterranean are also

featured. A huge, eerily-lit tank featuring nothing but jellyfish attracted a lot of attention as, safe from stings, the visitors get an underside view of the natural rhythmic 'workings' of the creatures' movements.

Exhibits are well backed up by comprehensive visual information panels and an added feature is the 'audible scenery' which changes from area to area providing a genuine feeling of 'you are here' with water sounds (naturally!) and a chorus of birdsong and insect sounds. There are even ocean-fresh aromas pumped around!

Audience participation is another important method of imparting information, with Touch Pools of native invertebrates such as Starfish, Mussels and Crabs whilst at the Beach Pier friendly Rays, Flatfish and walking Gurnards from



AQUARIUM OPENS



around the United Kingdom all line up for your attention — and stroking is definitely allowed!

Many of the exhibits are structured in such a way as to allow really close viewing of the life-forms within; for instance the covered acrylic viewing window is sloped back and down across shallow water exhibits thus enabling camouflaged fish to become more apparent. Talking of acrylic viewing panels, the thicknesses vary, according to exhibit size, from 25mm to 178mm, and the reason for using acrylic is that it is 15 times safer than glass.

Naturally, the well-being of the fish are uppermost in the maintenance programme and a 30,000 square feet quarantine department ensures that no disease-introducing risk is taken with new stocks. Just to make sure

the fish all receive their proper amount of food, an experienced diver delivers 'meals-on-flippers' to fish in the largest displays — a popular feeding-time attraction for all concerned (how many visitors will be afraid that the diver might be on the Sharks' menu list?).

Surfacing again, one enters the Oceanic Gift Shop for souvenirs, books and all fish-related merchandising, and to the Global Cafe and Bar. Later this year there will be additional attractions including two new Hotels, a Chinese Restaurant, a Namco Interactive Entertainment Centre and, in 1998, the Millenium Wheel will overshadow everything in the adjacent Jubilee Gardens.

Admission charges are: £6.50 (adults), £4.50 (3-14 year olds), £5.50 (Students and Senior Citizens) and £20 (Family Ticket).

The London Aquarium can be found at: County Hall, Riverside Building, Westminster Bridge Road, London SE1 7PB. Tel: 0171 967 8000. Fax: 0171 967 8029.

ABOVE
"We want to see the fish!"
Crows awaiting the Grand Opening of the London Aquarium.

BELOW LEFT
The Mangrove Swamp.

BELOW RIGHT
Starfish and Crabs within easy reach in the Touch Pool.

PHOTOS: A&P LIBRARY



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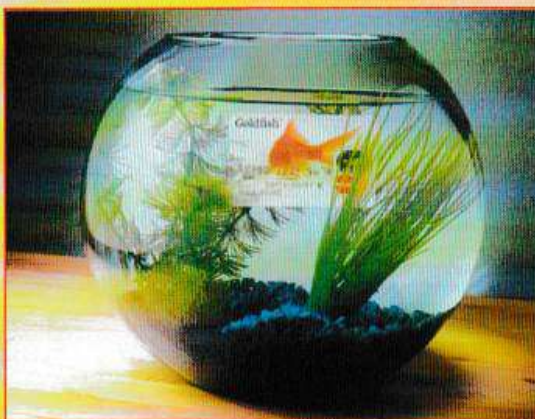
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News Desk ... News Desk

Goldfish thriving and multiplying rapidly in non-filtered, water-free environment of pockets and wallets!

Fishkeepers who strive to create a natural and pleasant habitat for their fish will be alarmed to hear that in recent months more than a quarter of a million people have decided that the best place to keep their Goldfish is in their pocket! Furthermore, they allow people to handle their Goldfish when they go out — in shops and restaurants especially, and some even take their Goldfish abroad, where they know it will be welcomed in more than 12 million different places!

The Goldfish in question is, of course, the Goldfish Credit Card, which was launched in September 1996 and is now presenting a major challenge to the cards issued by the High Street Banks and Building Societies. With of choice of four different fish designs and more to come soon, Goldfish has staked a claim as the best-looking credit card on the market. And while its appeal can also be attributed to the benefits it offers — such as no annual fee, an attractive interest rate and points towards savings on your



bills from British Gas, ASDA or the Boots stores — managing director Michael Parsons says the name and the imagery of Goldfish have played a big part in its success to date. He comments: "The Goldfish credit card is already showing signs of being a huge success, but I wish I had a £1 for each time I have been asked 'Why Goldfish!'"

The answer lies in the fact that last year saw the launch of more than 120 new credit cards, so there are now literally hundreds from which people can choose. By rewarding our card-holders with points to make savings on British Gas bills and other home essentials every time they use it our card was going to offer fantastic value, but it still needed

a little help to stand out from the ever-growing crowd. The humble Goldfish came to our aid, bringing with it a name and appeal that everybody warms and relates to. The home-based associations of Goldfish are highly-appropriate to the card and the benefits that it offers, as are the historical angles of the Goldfish being the symbol in Eastern culture of wealth and prosperity.

"Goldfish — in the form of both the fish and the card — certainly brightened up the rather grey old credit card market in an instant. The card's arrival was much trumpeted by the newspapers and within weeks it was featuring in cartoons and TV sketches. Now we are also discovering that there is so much we can do with the fish in terms of our advertising. In the initial launch ads the fish played second fiddle to Billy Connolly, but now they are gradually swimming towards centre stage."

Further details about the Goldfish Credit Card and an Application Form can be obtained by calling 0345 60 90 60.

Watch this space!

By Dr David Ford, Aquarian Advisory Service

AQUARIAN IS 21 TODAY!

It is the 21st anniversary of the launch of Aquarian this month and to celebrate the event Pedigree Petfoods, who distribute the range of fish foods,

have issued a special commemorative watch for trade customers.

The Aquarian Advisory Service was allocated a few samples and three of these have been given to *Aquarist & Pondkeeper* as prizes in the following competition.

Imagine you have won the Lottery — not a £10 prize but six correct numbers, making you an instant millionaire. What type of aquarium would you design

for your new home? Write a short essay (not more than one sheet of A4 paper) and send it to: Aquarian Advisory Service, PO Box 67, Elland, W. Yorks HX5 0SJ.

The three best entries will receive a free Aquarian 21st Anniversary watch and the top entry will be published in the magazine.

Aqua Company moves

Claire Stewart, Managing Director of Aqua Company Ltd, reports that the Company (distributors of O'Clear and Aqua Feast) have moved to new premises. The new address, to which all correspondence should be addressed, is: Aqua Company Ltd, Unit 3, Rake Industries, Rake, nr Petersfield, Hampshire GU31 5DU. Tel: 01730 892433. Fax: 01730 892488.

New water gardening course

It is always good to see a garden design course which includes a very strong section on water in the garden. There is a new Diploma Garden Design Course from the Institute of Garden Design.

The Course, simply titled 'Becoming a Garden Designer', introduces students to the principles of garden design in a logical and comprehensive way. It is written by Susan Stephenson, a regular contributor to *Aquarist and Pondkeeper*.

It is one of only a few design courses to include a full section on water in the garden and covers siting, construction, equipment, planting a pond, lighting and safety when including water in the garden design. It also covers topics such as



The Aquarian commemorative watch — the face carries the Aquarian logo and '21 years'. It is a high quality watch with a year's guarantee.

News Desk ... News Desk

planting and stocking for particular interests, eg, wildlife, fish, etc, planting schemes for maximum interest, materials and small scale water features for disabled and elderly and water features where children are present. For anybody who is interested in garden design this course will be of interest.

This very comprehensive and professionally produced course consists of 13 separate modules covering all aspects of garden design from getting started, what exactly a designer does, colour schemes, soils and sites, upkeep, gardening for the disabled and elderly, structures and marketing and promoting your business along with an introduction to tax, law and advertising. At the end of each module students undertake an assignment which is marked by a personal tutor.

Students achieve the Diploma of the Institute of Garden Design.

For more details about the course contact: The Institute of

Garden Design at PO Box 1561, Wedmore, Somerset BS28 4TD. Tel 01934 713563. Fax 01934 713492.

Another netful of information!

If you would like to be part of a fish club, but can't get there, or can't commit to a regular meeting, why not be part of the new online Aquarists Club?

Meetings are held interactively in a chat room on the second Sunday of each month, and most months we will have a guest 'speaker' who will be able to discuss particular fish keeping topics. Our 'speaker' on 11 May (between 8pm and 9pm British time) is Andy Gabbutt, from the British Killifish Association. He will be happy to discuss Killies with you, so if these fish are something of an unknown quantity to you then here's a good opportunity to fill in that

gap in your fish knowledge.

Everyone is welcome, so please come and join us.

You can access the club through the British Aquatic Resource Centre site, at: <http://www.cfkc.demon.co.uk>.

Other British fish sites will be joining in, and as each joins in you will be able to access the Club from their pages, and will find a return link from the Club page.

We look forward to meeting you, and hope we can build a real club on the Net, where people can make friends, find help, and generally be sociable!

Kathy Jinkings (British Aquatic Resource Centre — <http://www.cfkc.demon.co.uk>)

Death of Sydney Codling

It is with deep sadness that we have to announce that our founder, Sydney Codling, passed away peacefully this morning after his recent illness, at the age of 77.

Mr Codling, father of Hozelock's Chief Executive David Codling, formed Hozelock in 1959 to sell the first all-plastic hose connector. Since then the company has grown to become the UK's leading garden watering equipment manufacturer. Hozelock became a PLC in 1993 and now has a turnover in excess of £50m.

Mr Codling was a very well known figure in the garden industry and even after his retirement in 1989 continued to be a leading light in many of the gardening trade associations.



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We stock a large selection of African, South American and Coldwater Fish in our tanks.

Contact us for our weekly stock lists.

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Do contact us for further details.

UV lamp changing?

One of the problems when using UV lamps to clear green water is that the lamps have a specific operating life during which they remain effective against algae; remembering when the lamp change is due has always been a problem, but not any more.

The new Pond Clear UV Cleansers, from Tropical Marine centre Ltd, now include a 'Lamp Change' Indicator that acts as a clear visual reminder as to when the lamp should be replaced. The new units also include a free fixing kit that facilitates easy attachment to a plastic filter lid.

For further information call: Tropical Marine Centre Ltd, Solesbridge Lane, Chorleywood, Hertfordshire WD3 5SX. Tel: 01923 284151. Fax: 01923 285840.

Weekend water feature

Hozelock's new self-contained Pebble Fountain Kit takes no more than a weekend to install and enhances any garden with the sight and sound of running water.

The kit includes a base, lid and high performance pump with a choice of fountain heads. The biggest task in the installation process is digging a hole approximately the size of a 22 gallon bucket to take the base. After that it's plain sailing to insert the pump, fill the base with water and replace the lid. Choosing the pebbles to place on top and the type of fountain head could be the hardest task, but ultimately the most pleasant.

The Pebble Fountain is moulded in tough, high-density polyethylene with a strong domed lid and a recess for the supply cable. Occasional topping up of the large capacity base is all that's needed to keep the water flowing. Although the fountain base is frost-resistant in the average British winter it's still a good idea to empty out the water and store the pump indoors for extra protection.

The complete fountain kit, which does not include the pebbles, has a three year continuous use warranty and 10m of supply cable. (NB: No plug included as mains connection is recommended). It is available from aquatics specialists, good garden centres and DIY stores. RRP is £79.99.

BUY LINES

BARRY JAMES' round-up of the latest innovations for your pond and aquarium

For further information please contact: Hozelock Limited, Haddenham, Aylesbury, Buckinghamshire, HP17 8JD. Tel: 01844 291881. Fax: 01844 290344.

New tales from Blagdon

Water Fairies play a leading role in Blagdon Garden Products new 36 page Brochure which is now available. Called 'Tales from the Water Garden', the new publication offers very comprehensive guides on 'How to do' various activities in the garden in addition to showing the Company's full product range.

The 'How to do' sections include advice and illustrations on planning a water garden; building ponds with flexible liners; installing pre-formed pools; constructing concrete pools and creating waterfalls and watercourses. Guides showing how to calculate which pump or water-jet is right for your pond together with helpful hints on installation and maintenance are also included.

"We have set out to create a very attractive publication full of superb colour drawings which, as well as listing products, will be of real use to the water gardener and something they will refer to regularly," said Blagdon's General Manager John Harrison. The new Brochure costs £1.50 but carries a '£2 off Voucher' for a 500ml bottle of the new Pondsafe Bio Clear Algicide.

For further information contact: Blagdon Garden Products, Bristol Road, Bridgwater, Somerset TA6 4AW. Tel: 01278 446464. Fax: 01278446155.

Spring feeding

All Koi and pond fish keepers know that Spring can be a difficult time as fish begin to respond to rising pond temperatures and start to search for food. A long period of low pond temperatures can seriously deplete Koi's reserves of body fat, therefore it is important that energy in the form of food is readily available to them with the minimum of effort. Add to this the fact that pathogenic bacteria also multiply and become more active as water temperatures rise and that the natural immune systems of Koi are seriously drained by periods of inactivity and low nutritional intake and the recipe for the dreaded Spring Fever takes sinister shape.

Advancements in Koi keeping techniques in general, and increased awareness of the importance of correct nutrition in particular, now mean that Spring can be a time to enjoy your Koi, not to worry about Spring Fever — but during this period correct food selection is absolutely paramount.

Although its high digestibility renders Phoenix the ideal all-round food, Phoenix Koi Sticks are especially useful to Koi Keepers in Spring: they not only provide enhanced digestibility but when offered the Phoenix 2000 stick format quickly wets and provides Koi with a soft, highly-nutritious food source which is especially good for encouraging Koi back into full feeding and will often be taken by Koi who may refuse pelleted food. Phoenix 2000 Koi Sticks also have the additional benefit of stabilised vitamin C, vital in re-stimulating the Koi's immune system, especially important in

the Springtime.

Phoenix Koi Sticks satisfy the demands of discerning Koi Keepers who now have Phoenix available for all-season nutrition — Phoenix 2000 pellets or sticks as a staple diet, Phoenix XL for high temperature feeding, and Koi Sticks which also provide an ideal lower temperature food especially for Spring and Autumn feeding. Susanne Martin, Phoenix 2000 Product Manager commented: "Phoenix have built their reputation on total commitment to product quality, nutritional excellence and providing Koi enthusiasts with a balanced complete Koi food range. Not only are Phoenix Koi Sticks a great food but they are also a great tool in successful Koi keeping and especially useful for Spring feeding.

Phoenix Koi Sticks, along with the rest of the Phoenix range, are available from all good Koi and aquatic dealers.

For more information contact your local Phoenix 2000 stockist or Kerry Brookes or Howard Lilley at: Phoenix 2000 Fish Foods, Brookhill Road, Brookhill Road Industrial Estate, Pinxton, Nottingham NG16 6NS. Tel: 01773 580501. Fax: 01773 580264.

Fly away heron!

The latest deterrent in the battle against herons is a small water-resistant unit measuring just 8x6x2in and operates from any standard mains electricity supply.

The 'Fly Away Heron' device scans an area of approximately 10 sq metres and has a sensor angle of 180°. Transmitting and receiving signals over the activation area means anything moving within that area triggers a proven heron-scaring sound, as well as other natural fish predators. The unit will continually sound until the intruder leaves the detection area and volume can be adjusted by an internal volume control.

The unit comes with a full year's guarantee and warranty and is easily installed with simple-to-follow instructions. The 'Fly Away Heron' is manufactured in the UK by Hydrotron Co Ltd, and distributed throughout by Karobar Koi, from whom further details can be obtained.

Karobar Koi, 62 Bucknalls Drive, Cricket Drive, St Albans, Hertfordshire. Tel: 01923 677734. Fax: 01923 681807.

Growing Tips

BY
BARRY R JAMES

I have spent the last week reading and reviewing Books 2 and 3 of *Natural Aquarium World* by Takashi Amano. One common thread running through all three books in this series is the attention he pays to the foreground of his aquaria.

Unlike European aquarium designers he uses a whole variety of plants for this purpose, some being tall-growing species which are regularly trimmed to height, rather as one would mow a lawn in the garden. I wondered how he got Java Moss to behave as it does in his tanks and form a low carpet. Talking with a Chinese friend of mine who is a representative for a Singaporean Aquatic Plant Nursery I learnt that the company were exporting huge quantities of Java Moss to Japan which is grown emersed on nylon mats to form an instant turf. The mats are simply pegged down in the required position and, bingo, the job is done! There is no long months of waiting while the pegged down moss creeps over the gravel. They are looking into the possibilities of growing and

selling Fairy Moss (*Riccia fluitans*), Glossostigma, Hairgrass (*Eleocharis acicularis*), *Lilaeopsis novae-zelandiae* and *Marsala crenata* (Dwarf Four-Leaf Clover) in the same way. They are also selling big quantities of Java Fern (*Microsorium pteropus*), Congo Water Fern (*Bolbitis heudelotii*) and Dwarf Anubias (*Anubias nana*) already rooted and growing on pieces of bogwood.

With most other plants being grown in rockwool-filled mesh pots these days the 'instant' planted aquarium is already possible. The only drawback to all this is the price which would make such a venture extremely expensive. However, such rooted and pre-grown plants should ensure that they are of such quality that some of the normal failures due to transplanting are eliminated.

In any operation involving the fourth dimension there is always a trade-off. Do we buy small, cheap fish and wait months or even years for them to display their true form and colour, or do we lash out and purchase adult fish at a premium, looking

good and ready to breed? With the pond do we buy small rooted Water-lily cuttings and wait years for the first flower, or do we (or can we!) afford to get adult plants and ensure instant pleasure and effect? With aquaria and pools I prefer to pay up and get instant results. In the rest of the garden, however, I am more patient. I get a great kick out of growing plants from seeds and cuttings and the vast majority of trees, shrubs and herbaceous plants were acquired this way.

In the case of my Koi, however, I refuse to pay the high prices demanded for large fish and have

always settled for buying small quality fish and feeding them intensively to get them to put on weight as quickly as possible. On the subject of Koi I have noticed an interesting development in my pool.

When they were small I lost quite a lot of fish to the Heron. The survivors now average over a foot in length, some being very much bigger. The thing is I don't worry about the fishes' fate any more because although I am absent from the house for long periods and the caretakers pay no attention to the fish my losses have dropped to zero. The question is does the Heron find the big fish too much of a handful and ignores them, or have the fish become wiser in their old age and learnt to avoid the dangerous shallows in winter when cover is scarce? I don't suppose I shall ever know the answer to this riddle.

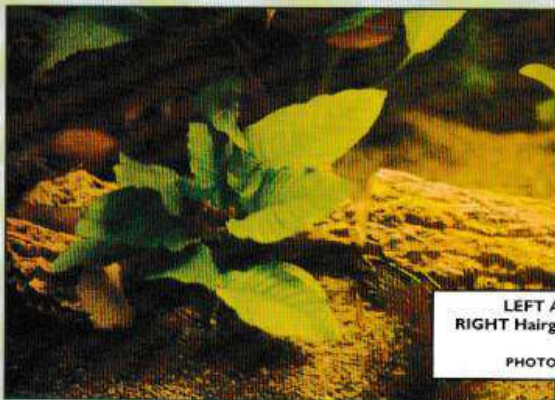
My paludarium project became a little easier to sort out on my visit to the house in Spain a couple of weeks ago. The thing is I had decided to lug the aquarium out from England because my enquiries at local

aquatic stores had met with a somewhat blank response. "Why do you want such a big aquarium with such thick glass?" was the usual question, followed by "I think it will be difficult to get such a tank!"

Quite by chance I was motoring along the Coin to Cartama road when I spotted a sign advertising tropical fish. Unable to resist, I turned off and drove down the track. Another sign prompted me to turn left where I spotted a small Finca. A guy, who was obviously North European, was in the courtyard building aquariums. It turned out that he had had a business in Sheffield and had been living and working in Spain for eight or nine years. I was treated to a tour of the premises. The fish house was steaming and very reminiscent of fish houses in the Far East. He had several hundred tanks some of which were the original angle-ironed framed variety with which he had started, and the rest all glass. The stock of tropicals and fancy coldwater was as large and as varied as anything I have seen in the UK.

Outside was a large lake with a few contented looking anglers busily landing Goldfish, Koi, and Golden Orfe. Their real quarry was Roach and Common Carp but the owner had thrown in a few hundred of the others and as the anglers put it, "They just love to get caught!". Anyway, John, the owner, promised to build my new tank for me on my next visit in the autumn.

Incidentally, for all those readers in Southern Spain there is a Danish guy near Mijas who grows aquatic plants for the North European market. The road is horrendous to his nursery but, according to a couple of people I have spoken to, the quality of his plants is superb and the *Senoritas* are not too bad either!



LEFT *Anubias barteri*.
RIGHT Hairgrass grown on a mat.

PHOTOS: BARRY JAMES



OPEN SHOWS

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

- 3 May Southend, Leigh & D.A.S. (FB)
- 4 May Aberdare A.S. (FB)
- 4 May Musselburgh A.S. (FS)
- 11 May Corby A.S. (FB); Four Lane Ends A.S. (FB)
- 11 May C.A.S.T. 88 (FN)
- 16/18 May Gracklemania
- 18 May Isle of Wight A.S. (FB)
- 1 June Derby & D.A.S.
- 1 June Erith & D.A.S. (FB)
- 7 June South Park A.S.S. (I)
- 8 June Redcar A.S. (N)
- 14 June Bristol Tropical A.S. (new date) (FB)
- 15 June Halton A.S. (FN)
- 22 June Workington A.S. (FS); Tameside A.S.
- 29 June Seascale Junior Fishkeepers (FB)
- 5 July Port Talbot A.S. (FB)
- 20 July Bournemouth A.S. (FB)
- 27 July Kent Association of Aquarist Societies (FB)
- 10 August Whitby A.S. (N)
- 24 August Tyne Tees Area Association (FB)
- 30/31 August Fishworld '97, Dunstable (FB); Koi Show, National Junior Fishkeeper's Open Show (FB); British National Open Show (incorporating British Open Fish Championship)
- 31 August Cramlington A.S. (FB)
- 13 September Hounslow A.S. (FB)
- 14 September Silkdown Show Team (FN)
- 28 September Darwen A.S. (FB)
- 12 October Solway A.S. (FS); W.A.S.P. (FB)
- 25/26 October British Aquarists Festival, George Carnell Leisure Centre, Manchester (FN)
- 31 October/2 November Supreme Festival of Fishkeeping, Weston. 2 November Supreme Championship and Open Show (FB)
- 1 November National Junior Fishkeeping Open Show (FB)
- 2 November Supreme Championship & Open Show (FB)



All at sea!

Marinists are reminded that the South East Marine Aquarist Society meets regularly on the first Wednesday of each month in the Gidea Park/Romford area.

For further information please contact the SEMAS Publicity Secretary, Peter Morley, on 01767 601793 or Nigel Jolley on 01279 301542.

Yorkshire Hot Shots

(Full report next month)

- Tableau Winner:** Alden A.S.
- Best in Show:** Derek and Pat Lambert, Lincoln A.S.
- Fish of Fish:** *Orinocodorus Eigenmanni*, Kevin and Kenny Castleford A.S.
- Best Exhibit:** I. Rowbottom, Silkdown S.T.
- AquaChamp Qualifier:** Anthony Fisher, Bradford A.S.
- Highest Society:** Castleford A.S.
- Best Trade Stand:** Creature Comforts

David Ford, Aquarian Advisory Service, reports ...

A Qualifying Heat of the AQUARIAN AQUACHAMP COMPETITION was held with six volunteers from the audience. The First Prize was a free Family Ticket to Chester Zoo with a behind-the-scenes tour of the Aquarium. Having posed questions in the categories of Tropical, Coldwater, marines, Plants, Equipment and General Knowledge I was delighted to

find a clear winner who had attained full marks; Simon Haynes. However, it turned out he worked for — Chester Zoo! Simon kindly donated the tickets to the runner-up.

Champion of Champions Competition

Due to administration problems through staff changes at the publishers of A&P, the issuing awards to those qualifying for the Champion of Champions Competition has been severely disrupted. However, we are pleased to announce that A&P will again be supporting the Competition at the British Aquarists Festival in Manchester later this year.

Society Show Secretaries are invited to register for the Champion of Champions in the usual way and relevant forms and details can be obtained directly from: Champion of Champions, c/o John Young, 13 East Court, North Wembley, Middlesex HA0 3QJ.

DIARY DATES

MAY

- 11 **CAST '88.** Annual Open Show at the Boy's Brigade Hall, Castle Street, Caergwrle, Flintshire. Booking in from 11am to 12.45pm. For more details please contact Peter Jones on 01978 761829 or at 1 Hope Street, Caergwrle, Flintshire LL12 9AA.
- 11 **Corby & D.A.S.** Open Show. Kingswood Community Centre, Alberta Close, Corby. Booking in on the day 9.30am-12 noon. Pre-booked entries to 01536 790932/01536 203729 (phone) or 01536 201536 (Fax).
- 11 **Four Lane Ends A.S.** 3rd Open Show at the Wallsend Community Centre, Vine Street, Wallsend, Newcastle upon Tyne. Further information from Dave Charters on 0191 215 1931.
- 17 **Goldfish Society of Great Britain.** YMCA, Barbican, London. 2.30pm. 'Judge Training in Showing of Goldfish', by Derek Seymour. Details from Roger Saltrick. 0181 550 1252.
- 18 **South Coast Cichlid Group.** Club Auction at St Nicholas Parish Centre, South Street, Portslade at 12.30. Lots available from 30 March 1997 onwards from Lorraine 01273 707926 or Sonia 01273 887741.
- 18 **Bradford & D.A.S.** Golden Jubilee Anniversary Mini Show and Lectures. Bowling Community College, Lister Lane, Bradford. 20 Classes, entries 20p each, YAAS judging. Lectures by Dr David Ford, of Aquarian and Brian Walsh, Chairman FNAS. Admission free but by advance tickets only. Societies' Secretaries can obtain tickets from: Antony Fisher, Secretary B & D.A.S. 145 Wrose Road, Wrose, Bradford BD2 1PT (01274 590608).
- 18 **Ryedale A.S.** Auction of Fish and Aquatic Goods. Over 60's Club, Hungate, Pickering. Booking in of Lots on the day from 10.30am-12.15pm or in advance to David Marshall 01751 472715 or Ron Marsden 01751 431411.
- 25 **F.N.A.S. Auction.** Brinnington Community Centre, Hereford Road, Brinnington, Stockport. Information from Ken Lawn 01625 427582.
- 25 **Tongham A.S.** Open Show. Mytchett Community Centre, Mytchett, Surrey. Details from Dave Caesar, 4 Wedmans Place, Rotherwick, Hook, Hants RG27 9BS.