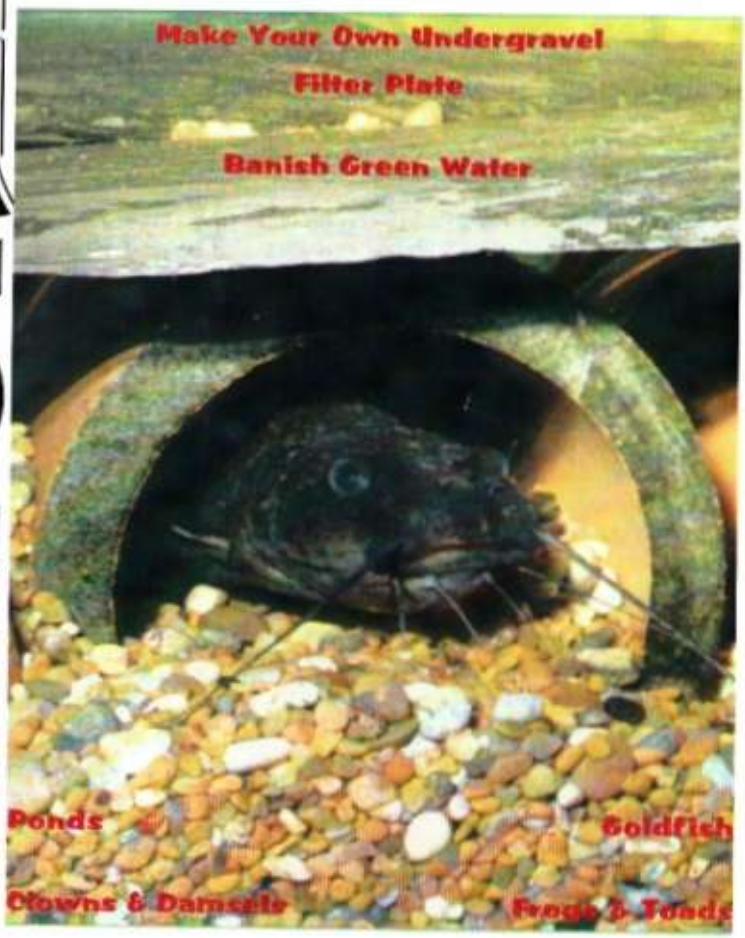
FISHWORLD MAGAZINE©

SUMMER 1999



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FBAS

EDITORIAL

Dear Readers,

Welcome to another issue of "Fishworld". By the time you read this Rog and I will be suffering (sic) in over 30 degrees of heat in Singapore. And, no I don't suppose either of us will be missing any of you too much.

In the Autumn 1999 issue there will be lots of news from "Aquarama 99" and the fish scene in Singapore in general. We intend to preview at least one fish shop during the time we're there, but that will be no surprise to any of you that know Roger at all!

Please note that all Assemblies and AGMs until further notice will take place at Syon Park. If you bring your FBAS cards with you, you can have a look around before the meeting.

There is a good mix of articles in this issue. I am sure all of you will be able to find something of interest.

By the way, Roger did get his license. It came very quickly after his reply to their letter, and it came with an apology! Bureaucracy can be human, too!

Sue Crew,
Editor

Contributions for the next issue should be posted to me by
25th July, 1999
at the address in the FBAS Year Book (1999) or
Sue Crew c/o Albany Print & Design - address below

Federation of British Aquatic Societies 1999
The Editor accepts no responsibility for views expressed in any article which remains the opinion of the author. E&OE

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COVER PHOTOS

Bagrichthys macropterus

Courtesy Roger Crew

WELCOME VISITORS

by Roger Foggitt

Many garden ponds, whether designed purely to attract wildlife or purely to keep fish in, will be subject at some time in their existence to invasion from many of our own native species of aquatic animal.

The variety of species attracted to a body of water is enormous and ranges from the smallest bacteria to, in some cases, larger animals such as otters.

By far the most common of "first" new visitors to the garden pond has to be frogs and toads as any area of water, no matter how new, always seems to attract them and often they arrive in their droves, even if the pond has only just been built.

Where do they come from?

How frogs and toads find their way to the new pond is still not really understood by the scientific world but there is some evidence that they will return to their pond of origin although this is more evident in toads than in frogs, who seem less fussy as to which body of water they choose. This is fine in explaining why frogs seem to appear at a new pond but does not exactly help to explain how toads manage to colonise a new pond. Perhaps they come across the new pond on their way back to an old spawning ground and simply decide to stay – who knows?

The arrival of frogs and toads at the pond edge tends to occur during the spring from as early in the year as late January onwards, although spawning does not really get underway until when daytime temperatures have begun to rise.

Although some frogs do hibernate in the pond, which appears to be mainly the preserve of older males, others such as female and young frogs and all toads tend to hibernate on land, under logs, in crevices in walls, under compost heaps and piles of stones, and generally anywhere where it is moist and protected from frost. The rarest toad in the UK, the Natterjack, actually overwinters in sandy burrows and has even been known to make use of the old nest sites of sand-martins.

Long Distance Travellers

Once hibernation is over the long trek back to the spawning ground begins.

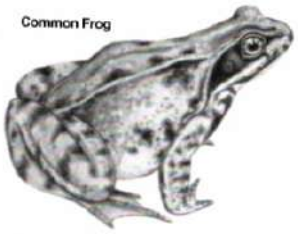
All travelling tends to happen at night with protection being found in the day in areas of long grass or under vegetation, or in the case of toads, under solid objects such as stones. This minimises the danger of predation and ensures that travelling conditions will be cooler and damper, although little travelling is done on frosty nights.

Many people who have an established pond will often describe, how in just a few hours overnight it goes from completelyamphibian-freeto absolutely crammed full of frogs and

toads all in various stages of mating or trying to find a mate.

Such sudden mass gatherings generally occur if the pond is populated more by toads than frogs. This is because the movement of the toad population does appear to happen all at once with huge numbers all travelling together which suggests that all the individuals from one particular group hibernate in sites quite close to each other. In fact accounts tell of many times when males encountering a female on their migratory routes will attach themselves almost instantly effectively "hitching a ride" and the unfortunate female has to carry the male all the way to their destination.

Common Frog



Frogs on the other hand generally move in fewer numbers often as individuals, so the "sudden" increase in numbers may not be as dramatic as with those ponds populated in the main by toads. However, numbers can be enormous by the end of migration.

Male aggression

Even though spawning itself may not occur for many weeks after arrival at the pond, the appearance of any female frog causes a stir amongst the male population and any males in the immediate area will immediately grab her in "amplexus". Often more than one male will make an attempt to gain "pole position" as groups of males fight over the female. However, the dominant of the group, often the first to get to the female, will be the one which becomes the mate. In many cases this is how the pair stay until spawning actually occurs, the unfortunate female having to carry the male about wherever she goes.

Many ask how the male frog seems to get such a firm grip on the female even though he must stay in place for days or even weeks. During the breeding season male frogs and toads develop "nuptial pads" on their forefingers which are pads of rough skin allowing them to get a better grip on the skin of their mate. The grip is so tight that females may even die if amplexus is over a long period of time and prolonged wounding at the site of embrace is commonplace.

Spawning

During March, spawning is triggered and a frenzy of breeding occurs often filling smaller ponds with spawn. Spawning, like travel generally takes place in the deep of night when all the frogs and toads in the pond will make their way to shallow water.

In frogs, spawning activity is slightly different to that of the toad. Spawning involves a frenzy of activity with males fighting for position trying to force those already in amplexus away from the female often without success.

The laying of eggs is very rapid with external fertilisation of the eggs carried out by the male immediately the female lays. Female and male then part company and the male will often swim away looking

for another partner. For the female the job is done and she will then move away to recover her strength. Total spawning activity in the pond often lasts for about a week, over which time it gradually dies away.

Breeding in toads, however, is not usually preceded by any kind of delay and occurs suddenly and finishes just as suddenly. Breeding often takes place in slightly deeper water and the actual process of spawning between a pair does take longer than with the frogs, as the "ribbons" of eggs laid by the female take longer to produce and spawning is much prolonged, interrupted by periods of "rest".

Growing Up

After approximately 2 weeks the jelly-like masses of spawn in the pond begin to move with a life of their own and the first tadpoles appear attached to the eggs themselves and a few days later they become free swimming. Development into frog or toad takes 10-12 weeks and every child knows how the tadpoles eventually grow legs and lose their tail to become mini froglets or toadlets. This metamorphosis is of course more complicated but suffice to say that before long there are many small froglets hanging around at the side of the pond waiting for rain. When rain does come they disperse in a frenzy of activity and begin their first summer on dry land. Maturation of frogs seems to take a little less time than in the toads, taking about two years as opposed to three.

Smooth or Warty?

The question which often appears in peoples minds when talking about frogs or toads is which is which? And as adults we seem to forget all those jokes about teachers at school looking like old toads because of the wart on the end of their nose or chin.

The common frog (*Rana temporaria*) and common toad (*Bufo bufo*) grow to a similar size of about 3½ inches in length with the Natterjack being slightly smaller.

However, the major difference is that the frog generally has smooth moist skin which is browny-green in colour interspersed with darker blotches.

Common Toad

They all have a dark patch behind the eye and the snout is often quite pointed.

Toads, however, have much more lumpy or warty skin which is really only a browny-grey in colour. It also has the added protection of being able to emit noxious toxins if attacked although this doesn't happen if they are carefully and gently picked up. The skin also doubles as an accessory "breathing" organ over which vital oxygen and carbon dioxide can be exchanged.

They also tend to be "stockier" looking than the frog and tend to waddle along as opposed to the jumping of the frog.

Those with cats in the garden will easily be able to tell whether frogs or toads are present because the frog will emit a loud distinctive squeal if alarmed, a behavioural trait which is not carried by toads.

How can I attract them to my pond?

In many cases both frogs and toads will make their home in any body of water be it an extensive lake or small water feature on a patio. However for those of us with ponds we can make them a little bit more attractive to our amphibian friends.

Firstly, because of their spawning activity taking place in shallow water this is a good feature to be built into a new pond along with a deeper area free from freezing in cold weather.

In existing ponds try piling a few stones onto a marginal shelf but make sure that they are stable. This also doubles for an easy access and exit to the pond which is not often a feature built into many preformed plastic or fibreglass ponds.

As with any pond, the bigger the better but frogs and toads will quite happily make their home in most standard sized ponds.

Both frogs and toads are not too fussy about the type of vegetation in or around the pond but plenty of cover is beneficial around the edge of the pond. Sunny spots also allow for better plant growth and therefore more cover.

As for the garden, again, frogs and toads are not too fussy. But if you live in an area surrounded by fences or walls then make sure that there are a few access holes dotted around the borders to allow them to come and go as they please.

Because of the frog's habit of spending the day in long grass, if you have a lawn then keep it well cut so that frog's legs are only a reality in French restaurants.

Those purists who only keep wildlife ponds tend to be against keeping fish in the frog or toad pond. True the tadpoles are likely to have a better survival rate in the non-fish pond but if it is well planted some will survive. Toad tadpoles are generally not at risk as they still have the ability to secrete noxious toxins from their skin even at an early stage of development. However, newt tadpoles are very prone to predation by even the cutest of goldfish. However, even in relatively highly stocked fish ponds some do get through to make it to adulthood.

It is not just fish which predate on the tadpoles either but nearly every other form of life in the pond including diving beetles, dragonfly nymphs and even newts, so little wonder that in a starting population of up to 2000 tadpoles only 10 or so survive through to adulthood.

Introducing frogs and toads to an amphibian-free pond.

It may take some time for frogs and toads to discover a new pond and some may want to accelerate the process by introducing spawn. At present wild stocks of frogs are diminishing so, unless you know that you can remove spawn from a wild pond with no damage caused, then leave well alone. Better to ask a neighbour or friend who has a well- established population of frogs for some spawn from their pond, most of which will. if the frog population is large, be only too willing to let you have some. Only about half a cupful of spawn is required to get things started and once in the pond it

can be left to get on with it and before long you will soon have your own frog population and it will be you complaining that the pond is jammed full of spawn.

Eating

Frogs and toads basically survive on a wild diet of ants, beetles, woodlice, snails, slugs and other creepy-crawlies catching them with their sticky tongues in a flash of quick-fire motion. In general a frog's diet is up to 25% slugs or snails so they make an ideal natural slug defence for the garden as well as mopping up other unwanted pests so all the more reason for their introduction to the garden. One word of advice, though, using slug pellets in the garden with frogs around can do them harm, so using other forms of slug defence such as my favourite - the "beer" trap is recommended.

Tadpoles in the pond will eat most anything including algae, waterfleas, bread and even TetraPond Floating Foodsticks, so little extra feeding is necessary.

The Trouble with Frogs and Toads is.....

Although frogs and toads are very much welcome visitors to our ponds, their very numbers in the pond at breeding time and the amount of spawn left behind afterwards can sometimes be of concern.

Adding any animal to the pond, be it fish or frog (or even tadpole), is going to increase the amount of waste generated so during and after spawning it is important, particularly if fish are present, to keep an eye on water quality and to carry out remedial water changes if ammonia and nitrite readings get to dangerous levels. There have been cases where fish, weakened by a decline in water quality have either been grabbed by amorous male frogs and toads with damaging results or even eaten alive by hungry tadpoles, simply because they were too weak to escape.

Having given this warning, the benefits of having amphibians in the pond far outweigh the potential problems, which if we are aware of them can be easily avoided.

Also and probably far more important, is that wild frog populations are thought to be declining and although we are not sure of the reasons why, one possible cause may be due to the decline in the numbers of wild ponds available as breeding sites.

By building and attracting these wonderful amphibians to our own ponds we can help in a small way, to conserve their numbers.

New Tetratec Whisper Air Pumps – Everything for a quiet life.

The Whisper Air Pump name has always been synonymous with reliability and quietness and since 1976, when the original Whisper Air Pump was manufactured, over 15 million units have been sold world-wide and many of the original units are still running today!

However technology has now moved on and 1999 sees the launch of the all-new Tetratec Whisper Air Pump which is quieter, more powerful and even more reliable!

These air pumps have been redesigned from the drawing board up, to produce whisper-quiet compact units with startling performance.

Using already tried and tested Whisper know-how the units have been designed using up to the minute electromagnetic technology and components which, when combined, produce units which provide amazing aeration performance even in the deepest of aquariums.

By deliberately producing prototype over-engineered units and then scaling them down, the new Tetratec Whisper Air Pumps actually work less hard for a given performance level increasing their reliability and lifetime but more importantly making them exceptionally quiet.

Even the flow control on the 3 largest units has been designed with increasing reliability and performance. Utilising an air-bleed system instead of the usual air-restriction method, results in a decrease in back-pressure on the diaphragms increasing their life and the life of the pump.

Combining all this with a vibration-absorbing rubber base and a sound deadening dense plastic casing really has produced an air pump which is truly Whisper quiet!

In fact independent tests carried out by Virginia Polytechnic Institute and State University in Blacksburg, Virginia USA have shown that even the largest models produce a noise level of only 28dBA with the smaller units producing a mere 18.7 dBA – Whisper quiet indeed!

As ever Tetra have taken the fishkeepers' requirements for aquarium air and have produced a truly amazing air pump which is Powerful, Reliable and Whisper Quiet!

The Tetratec Whisper Air Pumps are available in the following models;

Model	Air Flow (litres/hour)	For tank length Inches (cm)	For tank volume Gallons (litres)	No. of outlets	Adjustable flow	RSP
AP 30	30	18 (45)	2 to 10 (10–40)	1	No	£13.45
AP 50	50	24 (60)	6.5 to 13 (30-60)	1	No	£15.55
AP 80	80	30 (75)	11 to 22 (50-100)	1	No	£17.85
AP 100	100	36 (90)	17 to 33 (80-150)	1	Yes	£20.75
AP 150	150	48 (120)	26 to 50 (120-225)	2	Yes	£27.85
AP 200	200	72 (180)	33 to 88 (150-400)	2	Yes	£35.65

FROM TETRA

THE NEW TETRATEC RANGE OF PUMPS

Reliable

Powerful

Whisper Quiet

* * *

SUMMER: WHAT TO DO IF YOUR FISH BREED

(Tetra Pond and Fishkeeping Information Centre)

Coldwater fish (goldfish, orfe and koi) will all breed in a well-kept garden pond, spawning in late spring and early summer when temperatures are above 18 degrees centigrade.

Recognising the Signs - "The first signs are the males chasing the females and nudging their abdomens and tails," explains Roger Foggitt, Head of Tetra's Pond and Fishkeeping Information Centre. "Several males may chase a particular female if she is full of eggs. You will be able to distinguish between the sexes at this time (it is very difficult at any other time of the year) as the females will have well-rounded abdomens and males are thinner with small, pale raised breeding tubercles on the head and front of the body."

The female will be chased into areas of dense plant or blanketweed where she will release large numbers of eggs and the successful male will immediately fertilise them.

Eggs - The adhesive eggs look like small blobs of jelly, roughly 2mm in diameter, which stick to plants and algae in the spawning area. Goldfish will eat many of their eggs, but in a well-planted pond the number consumed is tiny when compared to the number that survive. A 4" long goldfish may produce 20,000 - 30,000 eggs!

Caring for Fry - The fry will survive in areas of dense plant growth. However, an ideal way to get your children interested is to keep the fry in an aquarium containing pond water. The eggs will hatch after 2-5 days and can be kept in the tank for 3-4 months before being released back into the pond. Feed the fry on the finely powdered TetraPond foods or TetraBaby fish food to ensure that they grow rapidly.

Colour Changes - Identifying the young fish in your pond can be difficult, as most of them start life as 'brown' fish. In some cases it can take 2-3 years before they change colour and become gold, red or orange. To distinguish baby goldfish from koi look at their mouths. Koi have two pairs of barbels - goldfish none.

BILL SLADE

A Tribute by Jack Stillwell

George William Slade - or Bill as he was generally known - passed away with a heart attack on 23rd April, 1999 aged 60.

Bill was a founder member of the Mid Sussex Aquarist Society and a member of the Redhill and Reigate Society. He worked as a Parts Manager for the PDH Group of garages and was due to retire this year. Bill took on the Treasurership of the Associated Southern Aquarist Societies in January 1992 after the death of Jack Jefferies.

Never one to seek the limelight, Bill could always be relied upon to play his part. At Weston, Dunstable and at ASAS Conventions and shows, as well as his own club shows, Bill would be there, unobtrusively but diligently working.

You only had to ask and a task was as good as done. Bill could be relied upon.

Together with his wife, Hylma and daughter, Dawn, they prepared and served the excellent buffets enjoyed by so many at ASAS Conventions and ran the raffles and canteens at our shows.

Bill was a good friend of mine and will be sadly missed by all who had the privilege of knowing him.

CAN WE BANISH GREEN WATER FOR GOOD?

by Les Holliday

If we do see any sun this year a natural outcome in most ornamental ponds will be the return from last summer of the dreaded scourge, green water. Green water is caused by a minute form of a group of algae called Cladophora which positively thrives in sunny conditions particularly if there is an excess of organic materials in the pond.

Cladophora has recently come under lots of scrutiny by researchers with a view to controlling algae blooms both in commercial aqua-culture and ornamental ponds. Various methods are currently being researched including a means of artificially culturing the enzymes given off by barley straw, which are quite successful in controlling Cladophora and also the culture of various types of protozoa which avidly graze on these nuisance forms of algae. There is even work in progress to identify various fungal and viral pathogens which might be used as a control.

Although the results of all of this research are eagerly awaited we do at present have some pretty effective means of combating the scourge of green water, perhaps the most common and persistent form of Cladophora.

The choice is pretty broad and many types of control are readily available. Chemical forms of control are perhaps the most common means mostly based on algicides but these have largely lost favour recently because they can have damaging effects on aquatic life and are at the best only short-term remedies.

Hagen Laguna Green Water Clarifier however, is a form of chemical green water control which is not an algicide but performs as a quick acting coagulant that bonds with the minute suspended algae in the water column making them large enough to be removed by filtration or sink to the bottom of the pond. Green Water Clarifier can be safely used in a fish pond to quickly eradicate green or clouded water by ionically attracting and 'clumping' floating particles. It works best with strong filtration since the bonded particles can easily be trapped and removed as they pass through the mechanical filter material. When the Green Water Clarifier has done its job the mechanical filter media

can either be removed and rinsed clean or discarded together with the trapped particles.

Biological controls are a more recent introduction which use various strains of bacteria selected for their ability to successfully compete against algae for vital nutrients. Treatments such as Hagen Laguna Algae Control contain a mix of these natural beneficial micro- organisms which compete with the single-celled suspended algae for vital nutrients. Without the essential building blocks for life the algae is naturally controlled and reduced. This natural method of algae control is not instantaneous, it requires time to take effect but the powerful biological action also provides an additional bonus in helping to maintain and improve water quality for the pond inhabitants.

Algae control can be safely used in any fish pond to inhibit the growth of algae providing a combination of non-pathogenic bacteria that will not harm pond inhabitants.

If you have a filter in your pond mechanical controls can also be employed, the most effective being the ultra-violet light steriliser. Designed to operate directly from a pump or in tandem with an external filter, the Hagen Laguna Powerclear UV Steriliser kills the algae as the water flows past the ultra-violet lamp. The Powerclear Steriliser also offers an additional feature in that it helps to remove pathogenic bacteria and harmful parasites.

Remember though that any treatment that kills algae outright may cause a temporary imbalance in the pond and possibly have a deoxygenating effect. Good water circulation is essential and a partial water change is usually advisable after an initial treatment should you have been suffering a real pea-souper.

Finally to answer my original question, 'can we banish green water for good'. Probably 'no', at present, but many of the controls we do have can certainly help to keep a pond clear and sparkling.

POND MAINTENANCE - THE KEY TO SUCCESS

by Les Holliday

Pond keeping is one of the fastest growing hobbies in the UK, appealing to a wide range of people and if you're already hooked on fishkeeping, an ideal extension of the hobby out into the fresh air. Strange as it may seem though, aquarists seldom make good pond keepers. The main reason being that despite lavishing lots of time and effort in keeping the aquarium in tip top condition, the pond, out of doors and for a large part of the year out of mind, tends often to become neglected.

Well if the thought of wading thigh deep in gunge at the back end of October trying to undertake a complete overall of the back garden pond doesn't seem a happy prospect, perhaps you will be pleased to learn that although an annual clean up

isn't completely out of the frame things have moved on and there are now ways to somewhat minimise the toil.

In fact there has been quite a revolution over recent years in the way we maintain our ponds with far more emphasis now on preventative maintenance than the form of crisis management most of us are used to.

Not surprisingly, quite a lot of encouragement in this direction has come from leading names in pond products who have started offering ranges of preventative maintenance measures with the big developments occurring mainly in liquid pond maintenance products. Whilst not offering an instant remedy to all our pond's ills many of these new products are based upon highly effective environmentally friendly biological treatments or well researched chemical remedies guaranteed to be equally friendly to the inhabitants of your pond with none of the side effects that were a feature of many of the chemical based remedies in the past.

If you're not yet an expert in these new forms of preventative pond maintenance, here's exactly how some of these treatments work to keep your pond looking its best and for a good selection you don't need to look further than the Hagen Laguna pond range.

First let's look at three Laguna, environmentally friendly, biological treatments that use teams of various strains of beneficial bacteria to greatly improve and stabilise water conditions. Live bacteria products can be a powerful tool as they are both a very effective and a natural method of treatment which slowly builds up providing long-term benefits in more stable conditions and a cleaner, healthier pond.

Pond Detox contains highly concentrated strains of bacteria that effectively remove liquified wastes such as ammonia, nitrite and other liquid toxins that adversely effect the health of pondfish and plant life. Pond Detox also reduces nitrates and when used as directed maintains optimum levels of micro-organism populations necessary to achieve peak water conditions.

Pond Clean is another living preparation but designed to eliminate sludge and organic waste solids from the pond. The organic waste generated by fish and other pond inhabitants, if left untreated will accumulate and create toxic conditions. The micro-organisms found in Pond Clean efficiently solubilize solid wastes reducing them dramatically.

Algae Control, the last of these friendly bacterial treatments, helps to naturally impede the growth of nuisance forms of algae such as blanket weed. The micro-organisms in Algae Control's super-concentrated formula compete with algae for vital nutrients. Without these nutrients, algae is naturally controlled and reduced.

Hagen also offer three non-bacterial products in their Laguna range including another algae treatment. Green Water Clarifier is used to control the suspended forms of

Laguna Plant Grow, another of these non-bacterial products, can also help to control algae by encouraging thriving aquatic plant growth. Laguna Plant Grow unlike many other plant fertilisers is specifically formulated not to contain phosphates or nitrates, substances know to promote algae blooms. Composed of balanced ingredients that are easily absorbed for rapid uptake by plant roots and leaf structures, Plant Grow encourages a full root system, strong growth and vibrant colours.

Water Prep, the last of these non-bacterial preparations, is used to eliminate chlorine and neutralise chloramine and toxic metal ions from raw tap water making this safe for all pond inhabitants. Water Prep also contains coating agents which bond to fish skin and scales where the natural mucus coating has been breached, offering protection until the natural protective coating is replaced.

Another form of preventative maintenance, in terms of combating the build-up of organic wastes in the pond, is to nip the problem in the bud at the earliest possible stage. Coldwater fishes, especially goldfish and koi, are gross feeders and any means which will lessen the load of organic waste produced by these greedy feeders has to be a more than effective approach.

Modern formulations of pond fish foods are now being devised which provide what is called high biological value. That is a good balance of highly digestible nutrients that are easily absorbed and utilised. This means that because these foods are very effective nutritionally, less is needed and of course less waste in turn is produced.

In the past some pond foods were very poor in this respect containing fish meal with large amounts of fish bone and scale. Those largely indigestible ingredients act merely as bulking agents and just add to the waste products produced by the fish.

Hagen Laguna pond foods are based upon highly advanced formulations which provide easily digestible nutritious foods. They also contain much less bulk so you feed much smaller qualities and the fish produce less waste.

Laguna Floating Pond Food is balanced to the needs of all varieties of ornamental pond fish containing many natural ingredients including fish, vegetables, yeasts, molasses and crustaceans. Fish eagerly react to this floating fish food rising to the surface of the pond and giving you the pleasure of watching them feed. Floating foods also allow a much better control to be exercised at feeding times avoiding overfeeding and waste.

Laguna Supreme Koi Colour is a highly digestible specialist food for koi containing many natural ingredients and 3 colour enhances, spirulina, marigold petal extract and kelp to bring out the vibrant colours of all koi varieties.

Whilst not a substitute for good pond care, many of these new preventative measures do help to make life easier when it comes to day-to-day maintenance and you can also be confident that you are using 'pond friendly' and effective means of treating common conditions and ailments which may arise in your pond.

POND TOP TIPS

from

Laguna

1. Always treat the pond water before adding livestock, the chlorine and chloramine in tapwater is unsafe for fish - Laguna Water Prep is a fast and effective dechlorinator that's ideal for this purpose.

2. Keep sharp objects well away from pool liners as you could easily puncture them.

3. Raise the pump from the floor of the pond on bricks or blocks to avoid clogging.

4. The maximum height of your fountain should be approximately half of the width of your pond.

5. Allow for 1" of fish per square foot of surface area. With improved filtration from a fountain or waterfall, you can have 2" per square foot.

6. It is recommended that you only keep large Koi carp in large, well filtered pools. The pool should be at least 3' (1m) deep and have vertical sides projecting above the surface so that the Koi cannot leap out.

7. Oxygenating plants provide oxygen only in daylight. Fish may suffer stress during warm, sultry nights unless additional oxygen is provided - water agitation created by a splashing fountain or waterfall is ideal.

8. Although most pumps operate from your normal electricity supply, the installation should be a planned and permanent one incorporating a circuit breaker. Always use cables and connectors designed specifically for outdoor and water garden use and have your system installed or checked by a qualified electrician.

9. THE FINISHING TOUCHES

When choosing your fish and plants, contact the aquatic section of your local garden centre for advice and help.

DEAR TARQY...

by T. Kisser

Friends, Romans and Emperors! Doesn't that sound stupid? I was going to begin by saying, "My dear fans," but She said that was rather presumptuous. Looks like She had another of them books with words in for Christmas (which is more than I got). However, I got even more acclaim than usual. Is "acclaim" the right word? My "acclaim" is really the reason for this article, which I can tell you is going to be a struggle to write because it is New Year's Eve and They have guests coming to stay and She said because of this She didn't have the time to sit down and type my ramblings. As you can see, I am the boss in this house... I insist that this article is printed soon and before any of that bad grammatical stuff like what She writes all the time! The real reason is because it pertains to the Festive Season and to print it next Autumn would be ridiculous. (You've got to keep these Editor people on their toes, you know. They think just because they put the word "Editor" after their names it makes them important!)

The reason for my bumptiousness (as He - Dad - would call it) is because of all the Christmas cards I *personally* received. I can tell you it caused no end of jealousy in this house, but we did have a few laughs. He was saying, "Fancy a bloody fish getting more cards than me" and She said, "You're only jealous because no one has sent you any cards saying, "I love you"." He said he'd be in serious trouble if anyone did. I really worry about Mum sometimes; She says such strange things. The other week during a conversation She told Dad it would be better if he was a woman!

Anyway back to what I was trying to say, I got loads of Christmas cards from my fans and I got so many that the Postman knocked on the door one morning and asked who Mr. T. Kisser was because he's only ever delivered to people called Green at this address. When She said Mr. Kisser was a fish he said, "Of course" and went off shaking his head obviously thinking She had already started to partake of the Xmas cheer. By the way I would like to take this opportunity through your most excellent publication (a bit of flattery goes a long way) to say how much I appreciated them.

However, much as I hate to be selective there are two cards in particular I would like to give special mention to and they are:

"Hot Lips" from Leeds said she was so madly in love with me she wanted me to share her tank! This younger generation think of nothing but *you know* (I'm not sure if I'm allowed to say *sex*.). I was going to say you should get to know each other first, then I realised that *I*, being so famous, people would naturally assume they *do* know me personally. She feels the same about Bruce Springstein apparently (whoever he is). Therefore to "Hot Lips" I would like to say, "I can't share your tank as I get travel sick, but I can find a nice quiet corner in my tank where we could make beautiful music."

The other fish, I think, tried to conceal their true identify as it was signed "I'lo" from Mount Pleasant, who saw my 'photo in A & P and thinks I'm the sexiest thing since Jaws. They also ask "Will you be

mine?" I don't mean to be arrogant, but you addressed me as "Dear Tarqy" and I have never approved of shortening one's name. I think it is most common and working class to do so. So, if you don't mind "I'lo" from Mount Pleasant, next time you contact me my name is "Tarquin" and also if you were so keen then why use a pseudonym?

I'm sort of considering doing some public appearances. Don't get too excited because I might not, as I think everyone should keep an air of mystery about oneself. The other problem would be that I am such a shy and retiring fish, would I be able to cope with the 'groupies' tearing at one's fins and fings? She can do that with the stupid things she puts into the tank from time to time.

It really did me a power of good receiving so many cards. I knew I was famous, but I don't think Mum and Dad realised just how popular I was until the cards started coming through the letter box. They are now all hung around my tank and She took some 'photos, which probably won't come out.

To change the subject, I haven't been well recently. We think I may be getting old! Mum was very worried about me because I was getting thinner. She went around everyone she knows asking advice and you know what someone said? "It's old age, flatten him with a brick!!!" We can do without advice like that, thank you very much.

Fortunately for me She decided to ignore that piece of advice, so instead She borrowed a small tank and everything that goes with it and I was moved into it. These two have no thought for the future whatsoever, you know. When Dad made a new kitchen they got rid of all the spare tanks and stuff so they wouldn't be tempted to set them up in the kitchen again. Then what happens? You suddenly need a hospital tank so you panic and run around borrowing stuff. Stupid people...

Anyway they got me in the tank, and weren't very happy about the fact that they didn't have anywhere to put it apart from their brand new kitchen table, which although I would never say anything, looks quite cheap to me! She was already putting this medicine for anorexic fish in the tank. All it did was make those two greedy Hoplos even greedier! We used to have a big one that would take the food out of my mouth, but he got moved into another tank, so now I have the two little ones doing the same. I can tell you it isn't easy trying to eat your tea with a pair of stupid Hoplos fighting to sit on your head.

The idea of moving me into a bare tank was so She could put lots of food in and what wasn't eaten would be cleaned out daily. Good idea you might think. Yes I know you're all sat there surprised with the realisation of how smart she is. Wrong... In *my* tank She would hold these food pills whilst I sucked them. Once She moved me into the hospital tank. (Her name for it. I'd call it Death Tank more like.) She stopped holding the pill and just threw it in for me to suck up off the bottom and bloodworm and flakes followed that. What the silly sod didn't realise was, everything was being sucked underneath this little sponge filter in the corner and sitting in a dirty smelly heap in the bottom corner of the tank.

She was spending all day asking how I felt, telling me to get better and chucking

more and more food in to add to the compost heap. I was screaming at her to test the water, but no, in came yet more food. She did a small water change the second day, but guess what, She didn't remove the filter so the compost heap stayed where it was. Because She couldn't see any un-eaten food on the bottom of the tank, she kept telling Dad that although I was eating loads and loads of food I wasn't doing the other, *you know* what goes in comes out. Dad came home from work on the third day and noticed the water was a bit cloudy. "I'd better test it," She said. "Thank God, for that," I thought. "This water is so potent it'll probably blow up the test tubes."

I don't know what the tests said, but she panicked, started running around waving her arms about and screaming. Dad took control of the situation and immediately put me back into my proper tank where I felt so much better right away.

"I don't understand it." She kept saying. "I thought I was making him better."

I hadn't the heart to tell her She almost killed me!!!!

CLUB TIP

With summer almost upon us it is just the time to get together a packed lunch or tea and take a trip to a local river or pond with your club. Carry out a survey of the species found in the water and send a list to "Fishworld". When we have several we will send them on to the Environmental Agency for them to update their records. Remember to measure the fish and if you can to sex them!

Life with 'Goldie' *by Donaldo*

BACK TO BASICS

HOW DO FISH 'WORK'?

Although fish come in a variety of shapes and sizes, they basically have all the same components.

All fish have skeletons to help them swim and to provide a frame for their muscles. They also have a skull to protect their brains and a spinal column with many individual vertebra joined together.

The majority of a fish's body is made up from muscle with the other internal organs packed into the body in a relatively small space. The high degree of muscle is required to help propel the fish through the water - usually by flexing the spine from side to side.

Fins also assist in helping the fish to swim and to stabilise it in the water. In particular the dorsal fin on the backs of fish stop it rolling over in the water as do the anal and pelvic (ventral) fins. The caudal (tail) fin is used like an oar to help push the fish through the water. The pectoral fins on a fish are like the arms on a mammal and are not used for swimming at speed, but are usually utilised with the pelvic fins to help a fish stop swimming (brake). Fins are also used by most fish as part of their courtship display. Usually they are fully extended during this time. Different fish have different fins or differently-shaped fins.

Probably the most important organ to most fish is its swim bladder. This acts as a buoyancy tank. It can also be used by some species to make noises like grunts or clicks, which will clearly be heard outside of the fish tank. Some fish do not have a swim bladder.

Fish obtain oxygen from the water by drawing water through the fish's mouth and it is forced out through the gill slits – the oxygen is absorbed and the carbon dioxide expelled. Gills are a series of branched organs that have a mass of delicate, thin blood vessels surrounded by a thin membrane. Gill rakers prevent damage from particles in the water.

These fish have to visit the surface of the water regularly to take air. If the natural habitat of a fish is such that it spends its life in water devoid of oxygen, it supplements its supplies by gulping air from the water surface. For instance labyrinthine fish draw air into a chamber rather similar to a lung, located in the head. Some catfish can swallow air into the gut and absorb oxygen into the body through the walls of the gut.

In the Autumn issue of "Back to Basics" we will discuss the different shapes of fish and what you can tell about the habitats they live in just by looking at them.

BACK TO BASICS

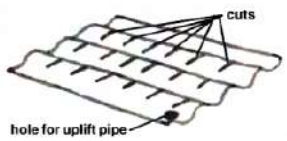
MAKE YOUR OWN UNDERGRAVEL FILTER PLATE

Most of the Hi-tech equipment available to aquarists today have Lo-tech equivalents that will do the job just as well and only cost you a fraction of the commercial price.

An essential part of maintaining aquarium water quality is sustaining a good filtration system.

This issue we will make a Lo-tech undergravel filter plate.

1. Measure the tank you wish to make the plate for.
2. Reduce your measurements by approximately half an inch all round.
3. Purchase (or otherwise acquire) a piece of corrugated plastic sheet - the type that you see on a shed roof is ideal - and cut it to the size you require using a hacksaw.
4. Next cut slits across the ridges, but be careful not to cut all the way through or to make too many and weaken the plate.
5. Turn the corrugated sheet over so that the cuts are on the bottom side and cut a 1" hole in one corner of the sheet for the uplift tube.
6. Again using a hacksaw, cut a 1" diameter plastic pipe to a little less than the depth that the water will be in your tank.
7. Gently take off all the burrs from the cut edges of plastic by rubbing them with an unused green kitchen scourer.
8. Place the uplift tube into the 1" hole in the filter plate and secure it using aquarium silicon sealant. Ensure that the slits in the filter plate are in the troughs and that the tube is facing upwards.
9. When the silicone has dried (after about 4 hours), you can place it in your aquarium and cover it with gravel. To ensure the system works well you will need at least 1" of gravel on top of the filter plate.
10. You will require an air pump, filter line and air stone to set the system in working order, but this filter plate will cost you a fraction of that which you may purchase in any high street store.



BACK TO BASICS

APONOGETON SPECIES

All Aponogetons require good light and their bulbs to be planted in a rich compost. Most of these plants require a neutral pH, soft water and will lay dormant during the winter. You should be careful of buying any bulbs which have no foliage as they may be one of the Aponogetons that are not sustainable in aquaria such as the **Aponogeton natans** which originates from Ceylon.

Probably the best known of this family is the **Aponogeton madagascariensis (syn. Fenestralis) (Madagascar Lace Plant)** although this is certainly not the easiest in this family of plants to acquire or to grow as the winter buds require a resting period at a reduced temperature. The buds die if they are kept at too high a temperature.

Although this plant is well-known it is not particularly easy to maintain. It produces large leaves up to 7.5" long, which are an intricate mass of lacy veins with no substance in between.

There is a similar species to this called **Aponogeton henkelianus**, which has leaves more of a brown colour. The leaves of this variety are less delicately laced and are more elongated.

Aponogeton crispus is an attractive variety which has large, bright green leaves with crinkled edges, which is a suitable plant for the foreground of your tank and is easy to establish. If you are lucky you may see the emergence of a flower stem which will grow out above the water and produce a hook-like flower.

Aponogeton ulvaceus grows to about 10" high and originates from Madagascar. The leaves are very broad and grow wavy. The leaves are a more yellowy-green colour. Because of this plant's size it is an unwise introduction to a small tank and should be provided with an uncrowded position to show to its best, but otherwise it is not a difficult plant to establish.

Other plants in the family are A. berbierianus, A. elongatus, and A. undulatus.

BACK TO BASICS

APISTOGRAMMA RAMIREZI

Common name: Ram or Butterfly Dwarf Cichlid

Size:	70mm
Origin:	S. America (Venezuela, Rio Orinoco)
Food:	Omnivorous
Water:	Soft, pH<7.5, <15dGH
Temperature:	24-28°C
Difficulty:	Moderate until acclimatised
Breeding:	Moderate-easy, egg depositor
Tank mates:	Small Tetras, labyrinths or armoured catfish

This is probably the best known species of the S. American Dwarf Cichlids. Its colours are stunning, which is one of the reasons it is so sought after.

It requires free swimming space surrounded by dense vegetation and water ideally filtered over peat to keep it soft and acidic.

In the wild this species inhabits slow-flowing, stagnant bodies of water in the northern regions of South America.

Sexing of the species is not difficult as in the male the first dorsal ray is extended into a flag shape.

Eggs are usually laid on a flat rock, the inside of a flowerpot or a depression in the gravel and can number between 200-400. These fish are monogamous and both parents guard the eggs and fry. First food for fry are Brine Shrimp Nauplii.

A gold strain has been cultivated by the trade where yellow replaces the natural blues of this beautiful fish.

CLOWNS AND DAMSELS

by Dr David Pool - Tetra

The Clowns and Damsel fish are undoubtedly the most popular fishes for a tropical marine aquarium - and rightly so. They are hardy, brightly coloured, have interesting behaviours and adapt well to aquarium life.

These two groups are both classified in the same family, namely the Pomacentridae. There are around 275 species of fish in this family, but by no means all are of interest, or even available, to the marine aquarist. In this article we will concentrate on the more popular species, although many of the details given will apply to the other species.

Distribution

The Clowns (or anemone fish) and Damsels are found in all of the world's tropical and subtropical oceans. Aquarists snorkling or diving in the Red Sea, Indian Ocean and tropical regions of the Atlantic and Pacific Ocean will almost certainly see Damsel fish. Clown fish are more limited in distribution being found primarily in Indo-Pacific regions and the Red Sea.

Clown Fish

The clown fish, named because of their bright, bold colouration and waddling swimming action, have a number of interesting behaviours which make them ideal aquarium fish. They are also commonly known as Anemone fish due to their close (Symbiotic) relationship with sea anemones, particularly of the Discosoma, Radianthus and Stoichactis species. These anemones have stings which are fired into anything that touches the tentacles and which can kill other animals much larger than the clown fish. It is thought that the clown fish are covered in a mucus which prevents the stings from being activated, and so allows them to swim freely amongst the tentacles. The anemone provides the clown fish with a tremendous benefit in an environment where there are innumerable predators. It is perhaps not surprising therefore that the clown fish are strongly territorial and will defend their anemone against all comers. This is, in turn, one of the benefits that the anemone gets from the relationship - that is having one or several fish which will drive away anemone eating fish. Other benefits to the anemone include the clown fish bringing food back to the safety of the anemone to consume. Any particles that are dropped are quickly engulfed by the tentacles.

Amphiprion frenatus

It is possible to divide the clown fish into two groups depending on their reliance on the anemone. The slender bodied clowns, such as Amphiprion ocellaris, A percula and A polymnus are relatively poor swimmers and rarely venture far from their refuge. Deep bodied species such as A clarkii, A frenatus and Premnas biaceleatus are stronger swimmers which will happily leave the anemone in search of food.

The first group of clowns are generally not aggressive to tank mates unless they come very close to their anemone. They are not easy to keep if not given a suitable anemone and will hide away in the presence of similar sized or larger fish. The second group are more boisterous and tend to be aggressive towards other clown fish and slow swimming species. To avoid problems it is advisable to add anemone fish of this group to a community tank after the other fish. In an aquarium they will live quite happily without an anemone - but you are missing one of the delights of marine fishkeeping if you do not keep the two together.

Reproductive Behaviour

In the wild several clowns will share a large anemone or group of anemones. The largest individual in the group is the female, the next largest a mature male and the remainder are immature males. However, should the female be removed a remarkable transformation occurs. The male changes sex and becomes a female and the largest immature male develops to maturity - all within 24 days!

Clown fish may breed at monthly intervals given a healthy environment. The courtship behaviour which occurs before breeding involves the male and female cleaning an area of rock or coral at the base of the anemone followed by the two swimming around the anemone quivering and touching occasionally. Finally the female deposits 300-500 eggs onto the cleaned area. The male then takes charge, guarding the eggs, removing any which develop fungus, and fanning them to produce a constant flow of oxygen rich water.

The fry hatch after 8-10 days, usually during darkness and then swim upwards. In the wild they spend several months in the plankton before searching for an anemone.

Clowns are one of the few marine fish that have been regularly bred in captivity. Given good water conditions and healthy fish, getting them to spawn and the eggs to hatch is not difficult. Tempting the fry to feed is more of a problem, though the availability of infusoria cultures has helped considerably.

Aquarium Maintenance

Clown fish are ideal inhabitants for a marine community aquarium. They are territorial, with the territory being centred around an anemone. However, this behaviour allows you to keep several fish in the same aquarium - providing each individual or pair has its own anemone.

individual or pair has its own anemone.

They are hardy fish and will tolerate slight changes in water quality - making them an ideal fish for beginners to the hobby. Anemones, however, are very sensitive and should only be added when the tank is matured and the owner sure of the techniques required.

Feeding is no problem and they will readily accept a diet of flaked or granular foods. Occasional treats of frozen or freeze dried foods are also appreciated.

Damsel fish

The damsel fish are beautiful active fish which do well in an aquarium with constant water movement. In the wild they are found in or above reefs, often in quite turbulent water. They use the reefs for protection and as soon as danger threatens they disappear into cracks and crevices within it.

Within the group of fish commonly known as damsels there is a wide range of behaviours, ranging from peaceful to territorial, and plankton eaters to grazers.

In the wild most damsels are found in small groups. In the aquarium it is advisable to keep them either singly or in groups of 3+. Keeping just two individuals can result in problems - often leading to only one survivor.

Feeding methods vary considerably in the wild. Most of the Chromis and Dascylus species are plankton feeders and can be seen riding the currents above the reef in search of small items of food. Other species such as Pomacentrus sp. and Stegastes are more herbivorous and will pick at algae from the coral reefs. Some species even have their own algae "garden" where their favoured algae grows well and other types are removed. Such fish can be quite aggressive to all comers as they try to defend their food source.

Breeding

Damsel fish have been bred in captivity and breed in similar fashion to the clowns. A suitable area of coral is selected to deposit the eggs which hatch after 5 days. The fry are also pelagic, that is they swim in the upper reaches of the water which allows good distribution of the young.

Aquarium Maintenance

Due to their tolerance of low levels of nitrite, some of the damsel fish are often recommended for newly set up aquaria. The blue damsel (Abudefduf cyaneus) and Sergeant Major (Abudefduf sexatilis) are two species often sold for this purpose.

Because of their active nature it is advisable to provide the damsels with plenty of free swimming space. An aquarium with dimensions of 36 x 15 x 12 inches (90 x 45 x 30cms) should be regarded as a minimum if a small shoal is to be kept.

Damsels will readily feed on flaked or granular foods in the aquarium. Providing vegetable matter such as lettuce or algae will also be appreciated. If kept with other fish it is often necessary to spread the food over the water surface or feed in two places as the active nature of the damsels can prevent other tank residents from getting anything.

Conclusion

Both the clowns and damsels make ideal aquarium residents. However, it is important to choose species which will live together - and live with the other fish you have or plan to have in your tank. As with all marine fish it is advisable to do some background reading before purchasing the fish - and seek the advice of your marine stockist.

Further reading

"Marine Aquarist Manual - Comprehensive Edition" By Dr P Loiselle and H Bensch. Published by Tetra

"The Salamander Encyclopedia of the Marine Aquarium" By Dick Mills. Published by Salamander

Scientific name:	Amphiprion ocellaris
Common name:	Common or percula clown
Distribution in wild:	Indo-Pacific oceans
Length:	2-3 inches (5-7cm)
Diet:	Good quality flake and granular foods. Live, frozen and freeze dried foods as an occasional treat.
Aquarium Maintenance:	Best kept singly or in groups of 1 female and two males together with suitable anemone. Aquarium bred specimens are hardier and easier to keep than wild caught specimens. Very peaceful fish - ideal for community tank.

Scientific name:	Amphiprion frenatus
Common name:	Tomato clown
Distribution in wild:	Pacific ocean
Length:	4 inches (10cm)
Diet:	Good quality flake and granular foods. Live, frozen and freeze dried foods as an occasional treat.
Aquarium Maintenance:	Best kept in groups of 1 female and 2 males together with suitable anemone - or singly. Can be aggressive towards tank mates therefore ad last to a community tank. Hardy and easy to keep.

Scientific name:	Amphiprion polymus
Common name:	Saddleback clown
Distribution in wild:	Indo-Pacific oceans
Length:	5 inches (12cm)
Diet:	Good quality flake and granular foods. live, frozen and freeze dried foods as an occasiona treat.
Aquarium Maintenance:	Dependent on access to its host anemone and will not survive for long without one. Easily bullied by other aggressive species. Not an easy species to maintain.

Scientific name:	Abudefduf cyaneus
Common name:	Blue Damsel
Distribution in wild:	Indo Pacific Oceans
Length:	2.5 inches (6cm)
Diet:	Good quality flaked and granular food. Freeze dried tablets and vegetable matter as a treat.
Aquarium Maintenance:	A very active species which may chase members of its own species and slow swimming fish. Best kept in groups of 3+. Hardy and easy to keep.

Scientific name:	Abudefduf saxatilis
Common name:	Sergeant major
Distribution in wild:	Throughout tropical oceans
Length:	5 inches (12.0cm) often less in aquarium
Diet:	A bold feeder on flaked and granular foods. Also feed freeze dried and vegetable matter.
Aquarium Maintenance:	Hardy fish, ideal for new aquaria. Best kept in groups of 3+. It is generally a peaceful species although adults, particularly if kept singly, may become aggressive.

Scientific name:	Chromis caeruleа
Common name:	Green chromis
Distribution in wild:	Indo-Pacific oceans and Red Sea
Length:	4 inches (10cm) often less in aquarium
Diet:	Flaked and granular foods. Shy feeder
Aquarium Maintenance:	Keep in groups of 4+. A peaceful active species which look attractive in a community or mini-reef aquarium.

Scientific name:	Dascyllus aruanus
Common name:	Humbug
Distribution in wild:	Indo-Pacific oceans
Length:	3 inches (7.5cm)
Diet:	Bold feeder which will eagerly consume flaked and granular foods. Feed freeze dried and frozen foods as an occasional treat.
Aquarium Maintenance:	One of the hardiest of the damsels. Can be territorial and aggressive to its own kind. This can often be overcome if very small specimens are added together. Don't add one fish at a time.

CICHLO-FILE

Cichlids are a group of fish with a wide distribution. They can be found in Central and South America, Africa, India, Sri Lanka, southern USA and some parts of the Middle East.

Cichlids share many of the characteristics of the common Perch which is related to them. Most of the Cichlids are predatory fish and only a few are suitable as community fish, especially during spawning when they become particularly aggressive.

The aquarist with an eye for an immaculate tank set-up will not enjoy keeping Cichlids as they (certainly the medium to large species) have a tendency to dig up plants, gravel and generally re-arrange their living quarters.

Most Cichlids enjoy slow-moving or still waters with some being shoaling fish. When they are breeding all pair off and become very aggressive to other fish entering their territory. These fish usually show remarkable colours during the breeding season.

One of the problems of keeping Cichlids is keeping up with the seemingly constant name changes. Cichlids are classified according to where they originate from:

African Cichlids - Some require special conditions and most of the really popular species are the smaller ones although their native environments are diverse.

American Cichlids - America hosts the group commonly known as the Dwarf Cichlids and a much bigger boisterous group. The Dwarf Cichlids are generally more easy to keep and are less aggressive except when spawning.

East African Cichlids - The best known from this region are the Lake Malawi, Lake Tanganika and Lake Victoria. Some of these fish are highly coloured - similar to marine fish colourations - and must be kept in hard, alkaline water to which a little salt is added. Most of these fish can be kept in large mixed groups until pairs are identified for breeding purposes.

West African Cichlids - These species generally require soft, acidic water and spawn in caves in the wild. Caves can be created in the aquarium by a flowerpot laid on its side.

PLANTS IN THE AQUARIUM

Aquatic plants are very important to a freshwater aquarium apart from just making the aquarium look more pleasing and more natural. They actually help to maintain the proper balance of water quality in a natural way.

If you have a reasonable light source for your aquarium, plants absorb carbon dioxide and give off oxygen, but beware of introducing too many plants as this process is reversed when light is not available at night and they give off carbon dioxide and absorb oxygen. They may therefore cause more harm than good! It is important to get the balance just right. The process of converting light into green leaves is called "photosynthesis", which I am sure you will all remember from school science lessons!

Aquatic plants will also help to remove nitrates from the water. If you use a biological filter, this will break down the ammonia that the fish give off in the form of body waste and change it into less harmful nitrate, which the plants will use as food. However, you should not rely solely on the plants to remove nitrate from the water. If your stocking level is too high there will still be a build-up of nitrates that will eventually kill off your fish.

If your light and nitrate levels are high you will probably attract a rapid growth of algae and have a real problem getting rid of it.

Plants will not make your aquarium maintenance-free. You will still need to carry out regular water changes (not with water straight from the tap please as the chlorine will kill fish and plants).

A well-planted aquarium will also provide your fish with somewhere to hide from larger or more active fish or even to breed in if you have the right balance in your tank. Some species of fish will even feed off the plants.

There is an old aquatic myth that you cannot grow plants in an aquarium that has an undergravel filter because of the constant water flow over the root system. I can belie that myth. At home we have a tank with some superb Amazon Swords in it that have thrived over an undergravel filter for almost ten years. The answer seems to be that we used a gravel tidy and the roots have lodged in that.

Don't despair if you cannot grow plants in your aquarium, there are some very good imitations available in the plastic variety that would fool most people.

SCOLICHTHYS GREENWAYI

COMMON NAME: None known

AGE WHEN BRED: About 75% full size.

CONDITIONING FOOD: Three day old Brine Shrimp Nauplii, Aquarian Tropical Flake and Growth Food, blanched lettuce, Promin fine and bloodworm.

GESTATION PERIOD: Approximately 30 days.

BREEDING TANK: 24" x 15"x 12" with undergravel filter and internal filter. Planted with Java Moss, Amazon Sword, Cabomba and Cryptocornes.

WATER CONDITIONS: pH 7, GH 10°, Temp. 80°F.

NUMBER OF FRY: 10

FRY: Approximately 5mm long.

FRY RAISING: Fry left with parents to rear. Fry had access to all adult foods and in addition were fed Aquarian Fry Food. After about a fortnight Aquarian Growth Food was given.

OTHER INFORMATION: The parents do not seem to trouble the fry if cover is given and seem to be a suitable species for flock breeding. Adults seem to thrive if given regular water changes and are suitable community fish if kept with other small species.

YORK & DISTRICT AQUARIST SOCIETY

Martin Thoene wishes to start a postal society dedicated to Loaches & Botias. Anyone interested in following this fascinating aspect of the hobby can contact Martin on:

Email: Martin.Thoene@lakenheath.af.mil

or Alan Holmes at:

6, Bowes Avenue, Heworth, York
YO31 0UZ

Alan and Martin also advise there is a web site dedicated to Loaches and Botias at:
http://aquaweb.pair.com/LOACH

TYNE TEES AREA ASSOCIATION

Due to lack of trade support, the Tyne Tees Aquatic Festival will not take place this year. Instead the Tyne Tees Area Association will host an Open Show on Sunday, August 29th, 1999 at Eastbourne School, Darlington.

In conjunction with this Show, replacing the usual auction, there will be two guest speakers - Graham Ash talking on Cichlids and Catfish and Derek Lambert talking on Livebearers.

There will be the usual buffet lunch.

Tickets for the buffet, talks and unlimited show entries are £2.00 and must be purchased in advance from Mrs. J.A. Bell on 01325-466630

Show entries only - on the day - £1.00

THE LONG AND THE SHORT

by Andrew D. Jones

My introduction to the world of fishkeeping probably started like most fishkeepers did with a single Goldfish won at the fair. This poor specimen was kept in a plastic bowl with a little rock castle in the centre of the bowl and believing that I had the perfect set-up, I progressed from bowls to aquaria and onto the set-ups I have now. These comprise of a 30", a 36" and two 18" coldwater aquaria.

I am a lover of the ornamental-type fancy Goldfish. I find that if these fish are provided with enough room to grow on and a balanced diet, they will make the grade at shows. Originally I thought that I could fill all four of my aquaria with some good varieties of ornamental Goldfish, but things did not go to plan. I keep my Fantails and Veiltails in my 30" aquarium with a Fluval 203 external canister filter.

In the 36" and the two 18" aquaria I keep common Goldfish, Comets and Sarasas. Some of these I have bred myself whilst others are from people who won them at the fair and they did not want them or know how to look after them.

I decided that I liked the quality of certain adult Fantails and Veiltails that I kept in my 30" aquarium and decided to breed from them. I removed the ones that I did not want to breed from, putting them in one of my other aquaria towards the end of the year prior to my intended mating of the Fantails and Veiltails. I then started to get the breeders into condition so that they achieve peak fitness at the time of breeding and are free from disease and poor colouration. I condition my fish by feeding a good quality sinking pellet.

The only problem there seems to be with keeping fancy ornamental goldfish is that from time to time they suffer from swim bladder problems, caused mainly by the balloon-shape of their bodies. Much of the problem can be alleviated by feeding a sinking pelleted food and adding Bloodworm to the conditioning programme. I keep a heater on during the winter months in the 30" aquarium as the ambient temperature can drop and this type of fish are easily chilled, which can ultimately affect their condition. I set the heater at 20 degrees Celsius.

For the months in which the fish are due to breed I have a 12" x 8" aquarium set up for just the harvested eggs. The adults are left in the main aquarium and the 12" x 8" is sterilised and cleaned, filled with tap water (with a dechlorinator added) and a Whisper 200 airpump with single airline and stone added. I run the airpump on the small tank for two to three weeks until the water is fully matured. It is then ready for the eggs to be added and left to hatch.

At the start of the run up to the adults

breeding I remove the Fluval 3 canister so that, when they are laid, eggs do not transmit into the canister itself, and to reduce the flow rate. I take the precaution of masking the uplift tube of the Fluval 2 to reduce the risk of eggs getting into this canister. I put a spawning mat into the breeding tank to trap the eggs when they are laid. At this point the heater is still left on to help with the spawning process. Eggs become scattered around the tank with some also stuck to the sides. After removing them I

swill them under the tap (***Eds note: not really advisable as the chlorine may harm them***) to remove debris that has collected on them. I test the pH in the breeding aquarium and the small aquarium to ensure the water is neutral (pH7) and check the nitrite and ammonia levels are safe. I also test my tap water as this has sometimes caused problems. I test the small aquarium daily after the eggs have been added to ensure that the water quality is maintained. I test the other aquaria twice weekly.

Once the eggs have been added to the small aquarium, they take about five days to hatch at a temperature of 20 degrees Celsius. Not all of the eggs hatch of all the thousands put there, but some survive to grow into quality adults. You will notice that non-fertile eggs will fungus over and these should be removed immediately so that they do not damage the others. When the fry are first born they resemble tiny black splinters of glass that hang on the sides of the tank. At this point I change the air stone for a sponge filter which will clean the water, add oxygen, but not damage the delicate fry. The fry will not eat anything until they have consumed the eggs sacs and not all fry will hatch at one time so you need to be vigilant. When the fry become free swimming this is a sign that you will need to commence feeding. All the fry will have single tails at this point so do not worry.

I provide my fry with an Egglayers fine powdered food as a first food and continue this for a month. Then I switch to Brine Shrimp nauplii which I hatch in a glass jar holding about a pint of water. I use the shell-less eggs and a teaspoon of sea salt. The time it takes for the Brine Shrimp to hatch varies according to the temperature. I maintain mine at 20 degrees Celsius. I feed the powder food with the Brine Shrimp for a while to ensure that the smaller fish have a chance.

I carry out 10% water changes every second day using a piece of air line. I also remove all uneaten food at the same time. I also rinse out the sponge filter about once a month. It is important that this is done in waste tank water so as not to kill off the beneficial bacteria the sponge contains.

When any deformed or weak fry are discovered they should be removed. When the Fantails grow their double tails, select these to keep and discard the others. Like common Goldfish the youngsters take some time to colour up and the brightest coloured fish should be selected to maintain the strain. When the youngsters are large enough I feed them on a baby pellet food containing the extra vitamins needed to grow on. I remove the larger fry when their tails develop into the large flowing appendage of the Veiltail. I am careful to house them where their tails are not nipped which may go to fin rot.

When all the young have been moved on and the 12" x 8" tank is empty, it is cleaned and stored ready for next year. I sort the fry as time goes on and pick about five I think have show quality, which I will want to breed from in the future and put them in my 30" aquarium. I leave the other fry in the two 18" tanks for the time being.

During the summer months my ornamental fish live in my 166 gallon, 3' deep pond. I have a Whisper 800 air pump connected to the pond with two pond air stones to help circulate the water and add oxygen. I also have plants in baskets on the shelves and in bunches in the water. The trimmings of Elodea are also added to my aquaria. In late September I turn off the pond pump and bring the fish indoors. Before putting them in the aquaria I bathe them in Sterazin and check them thoroughly for flukes, lice, etc.

Many fishkeepers do not get as far as breeding their fish and keep losing them. They cannot seem to understand why this is. It is probably down to the poor quality of the water. Get that right and fishkeeping can be a really rewarding hobby for all ages and it needn't be an expensive one!

ME AND MY PET FISH

How to be the perfect pet owner

Christine Morley and Carole Orbell
Two-Can Publishing Ltd, London
ISBN 85434-452-8 paperback @ £3.99
also in hardback ISBN 1-85434-4521-X @ £7.99
Reviewed by Roger Crew

One of four books in a series on pets intended to be the introduction to petcare for children, this is the little book that could generate the interest in the hobby for tomorrow's aquarist. Well laid out with large print, photographs and cartoon-like illustrations, this is the sort of book that children will love to read. I found it difficult to describe the suitable age group for this book, but I suspect that those old enough to tackle large print proficiently will be able to absorb the content, especially with a little adult help!

The only criticism is the assumption that these juniors will wish to keep goldfish only, for this is where the focus of the book lies, although the title would not have you think so! I have assumed that the reliance on internal power filters is merely indicative of editorial space, although reading the flyleaf which told me the consultant used was "Animal Nurse of the Year 1995" hardly filled me with confidence. However, she either had some good knowledge or good advice, as the book covers most aspects quite competently. For my money, this would have too short a life span to be worth investment in the hardback version, but the paperback one is sound value.

SEAHORSES

An Identification Guide to the world's species and their conservation

by Sara A Lourie, Amanda C J Vincent and Heather J Hall
Project Seahorse* London
ISBN 0 9534693 0 1 @ £19.99

There are times when I actually regret that FISHWORLD is only published quarterly. Not often I readily admit as it usually involves extra work, but I have been itching to tell you all about this book and I did feel a little disappointed therefore, that a certain

monthly published a review in their "June" issue (i.e. in May – crazy world isn't it?) However I feel that even if you read that review, as aquarists in particular, you will not have been told the true worth of this book. No criticism of the monthly magazine intended.

The first thing to strike you about this book is the unique cover, it is spirally bound which enables it to lie open easily, and has a nifty "wrap-round" cover which tidies it up nicely. The cover sleeve opens out both back and front to reveal life-size silhouettes of every species – an invaluable guide in itself. Inside the first 64 pages consist of glossy heavy grade paper containing the text pages which explain the Biology, Trade and Conservation, Taxonomy and Classification and Seahorse identification sections. This style resumes on page 133 continuing through to the end of the book (214 pages in all), covering colour plates, Geography, Related Genera and further information.

Between the two sections described lies full descriptions of all of the 32 species which the authors consider to be valid. These descriptions consist of facing pages printed on a heavy duty rough textured paper which can only add to their durability. A line drawing illustrating both male and female examples, together with a map illustrating the known locations of each species, face a page of descriptive text. This section is also coded by thumb-print colours down the edge to enable quick reference by geographic location.

Whatever your taste in fish groups, and even if, like me Marines usually are of passing interest only, (OK I will be honest – they bore me! – each to his/her own) you will find this book fascinating reading from cover to cover.

For me, one of the endearing qualities (I find I have returned to the book several times already) is the way the authors have pitched the technical element at both a high level and volume without being at so advanced a level as to "go over one's head". I am sure that most experienced aquarists find many aquatic publications lacking in technical content and will welcome the opportunity to find recognition of themselves as people of some intelligence who are not talked down to.

This book deserves consideration then not only from those with a pre-existing interest in the marine area, who will undoubtedly find it valuable, but also from the aquarist seeking a new area to explore. Buy it, you will not regret it!

**Project Seahorse is an integrated programme of conservation and management initiatives, working to ensure the long-term persistence of wild seahorses. It was created in 1996 in response to global threats to seahorses. Project Seahorse is led by Dr Amanda Vincent (McGill University, Montreal, Canada) and Dr Heather Hall (Zoological Society of London).*

ALFARO CULTRATUS

COMMON NAME: Knife Livebearer

AGE WHEN BRED: 6 months old (approx. 50% full size)

CONDITIONING FOOD: Aquarian Tropical Flake, 3 day old Brine Shrimp nauplii, dried daphnia, blanched lettuce, frozen bloodworm, etc.

BREEDING ATTEMPTS: 3

GESTATION PERIOD: 24 days

BREEDING TANK: 24" x 8" x 10" subdivided into three bays (two 6" x 8" x 10", one central 12"x 8" x 10". Undergravel filter. No artificial light. No direct sunlight. Plenty of floating Indian Fern, Riccia Fluitans and Java Moss.

WATER CONDITIONS: pH 7, GH 10°, Temp. 80°F, old water.

FRY: Approximately 50. Fry moved into one end bay as adults highly predatious of fry (not suitable for flock breeding). Fry less than ½" long at birth and drop to gravel. Raise to surface at approximately 12 hours old.

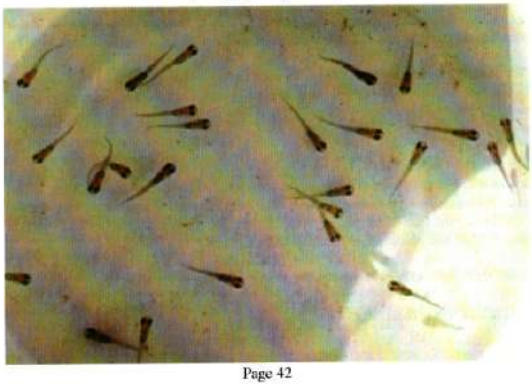
FRY RAISING: Mother moved back to main tank after being given 24 hours rest and a good feed of bloodworm. Fry were initially given Liquifry Livebearer food with Aquarian Fry Food introduced at day 2. Three day old Brine Shrimp nauplii introduced on day three. Other foods introduced as fry became big enough to eat it.

OTHER INFORMATION: It is written that these fish reach sexual maturity at three months old. Female does not show gravid spot as most livebearers do, this is one of the major difficulties with breeding this fish. The breeder needs to acquire an 'eye' for the condition of the fish. The female does 'square off' in late pregnancy and forms a 'double chin' and black line around the belly.

FURTHER DETAILS: Sue Crew (breeder)

PHOTOGRAPH: Next page

TOP: Alfaro cultratus pair (Male bottom, Female top)
BOTTOM: Alfaro cultratus fry, 24 hours old including brine shrimp egg cases
(Photographs Roger Crew)



FBAS MERCHANDISE AND PUBLICATIONS

Available from Show Stands, by Mail Order, or at General Assemblies

Book No.			
1	Cultivated Fishes		£1.00
2	The Sunfishes		£1.00
3	Show Fish Guide (including binder)		£5.00
3	Show Fish Guide - Supplements		£1.00 ea.
4	Goldfish Standards		£1.00
5	FBAS Constitution & Show Rules (1999)		£2.00
6	National Show Fish Sizes (1999)		£3.00
7	FBAS Yearbook (1999)		£1.00
8	Forming a Society		£1.00
9	Dictionary of Common/Scientific Names (Freshwater)		£2.50
10	Scientific Names and Their Meanings		£1.50
11	Plants		£1.25
12	Dictionary of Common/Scientific Names (Marine)		£1.25
13	Nishiki Koi (in colour)		£1.50
14	Organisation of the Open Show		£1.00
~~15~~	~~Revised Cichlid Names & Show Classes~~	Out of print	~~£1.00~~
~~16~~	~~Rasboras~~	Out of print	~~£1.50~~
17	Goodeids		£1.50
18	Quiz Book 1		£1.50
19	Synonyms of Fish Names		£1.50
20	Longfinned Variants and Others		£1.50
21	Tropical Species		£1.50
22	Tropical Species		£1.50
23	Tropical Species		£1.50
24	Not yet published		
25	Quiz Book 2 (new)		£2.00
26	Species Reference Guide (loose-leaf - £1.50)	(with binder - £4.00)	
	Binders for booklets and supplements		£2.50
	Car Stickers		£0.20
	Lapel Badge		£1.00
	Rules		£2.50
	Pointing Disc		£3.50
	Fish Penknife		£1.50
	Key Fob		£1.25
	Refrigerator Magnets/Fish Brooch		£1.00
	Plug Label		£0.25
	Sweatshirts (FBAS)		£9.50
	T Shirts (FBAS)		£6.50
	Umbrella		£10.00
	Holdall		£9.00
	20 for size badges		£0.20

ORDERS:

BY POST Send cash/cheque with order + 25% of total for p & p
Cheques made payable to FBAS
Send to: Address in FBAS Year Book (1998) or
Roger Crew c/o HMP Albany, 55 Parkhurst Road, Newport,
Isle of Wight PO30 5RS

SHOWS Telephone orders for collection at Assembly or shows

All Judges will have received the new Senior Judge's checklist and after a few shows it does seem to be working out very well. I would like to ask all Judges to read this document (especially the Senior Judges) so that you are fully familiar with it and so that all Judges know what to expect from a Senior Judge at Open Shows. If any Senior Judge needs more forms, either write to me, at the address below, or see me or any member of the J & S Committee at Open Shows we are attending and we will gladly give you some more. With regard to the postage for the return of these forms, we will be reimbursing all Senior Judges for their postage expenses and when we know which Judges have officiated where as Senior Judges during this season, we will be able to send out stamped, addressed envelopes next year.

I am pleased to say that I have received all workload forms. Most were received in time, but there were, of course, a few stragglers who needed reminders. Hopefully this will not be necessary next year.

As you are all aware next year heralds a new century in our history and the J & S are thinking of ways to try and brighten up the covers of the yearly publications we are responsible for. We are therefore looking for ideas for our front covers, so all you budding illustrators, get working!

As the first of the shows have been completed, have any new or odd fish been spotted? If so, please let me know so that I can publish details of these for other Judges to look out for.

Has anyone spotted the deliberate mistake in this year's Size Sheets. If not, look carefully, try to spot it and I will reveal what it is in the next issue of "Fishworld".

I am fully aware how hard it is for societies to book 'live' speakers as well as finding them, so I will ask all Judges who are not on the speaker's list if they would like to be put on the list of speakers. This obviously helps other societies in your area as well as passing on your expertise in your favourite subject!

A fairly new book came into my possession near the end of last year and it would be of great use to all Judges who have not purchased it yet. This is the sixth book in the Mergus Aquarian Atlas books. It is a pictorial index of the first five volumes of the series of books. This book contains 4600 photographs, and although the pictures are all in the five previous volumes, there is no text except very brief details on size, location and water conditions. The book I have is in German, but I am given to understand that it is now also published in English.

Colin Pannell,
9 Edwin Road,
Hastings,
East Sussex
TN35 5JT

NEW SIZE SHEETS (Book 6) NOW ON SALE

£3.00

There have been approximately 160 changes made to this year's Size Sheets, so don't miss out or make mistakes when exhibiting your fish during 1999!

AFFILIATION STILL ONLY COSTS £12.00 pa

Can your Society or Area Group afford not to affiliate?

ALL NEWLY AFFILIATED SOCIETIES NOW HAVE FREE VIDEO/ TAPE/SLIDE FOR ONE YEAR

Tetra CORAL CREATIONS

FBAS

A Tetra (USA) line that became unavailable in the UK three years ago. Recently a small stock was identified in the UK warehouse and Tetra have agreed to its **sole distribution** in the UK through the Federation of British Aquatic Societies' Merchandising at **absolutely knock-down prices!**

Here is the opportunity for all of you marine or Rift Valley enthusiasts (or any fish-keepers for that matter) to create a coral scene **without damage to the environment,** for **Coral Creations** are a synthetic resin product which is totally inert and harmless to your fishtank. Now you can enjoy the sight of lifelike 'coral' at a fraction of the cost.

As an example, the top of the range "Brain Coral 1/2 helmet" which **normally would retail at £23.25** can be yours for merely **£6.60** and for a "Mini Brain Coral" in either white or natural, you pay only **£2.00 instead of £6.75.** Do not forget that these recommended retail prices are now three years old, so you are getting even better value!

This unique opportunity is only available to you through FBAS Merchandising. Obviously the cost of post and packing would be high on items of this kind, so we are offering **Coral Creations** for sale only at open shows and major shows and only whilst stocks last.

Enquiries via the Merchandising Officer - address in your Year Book!

1999 SHOW DATES AND EVENTS

Rule Codes: A = A of A; FB = FBAS; FN = FNAS; FS = FSAS; U = US of A; Y = YAAS; B = BKKS; BK = BKA; I = International Goldfish Standards; N = NEFAS; C = CASB NGS = National Goldfish Standards

5.6.99	**FBAS General Assembly - Del/member cards for free admission to view Syon Park**
5.6.99	South Park ASS (I)
6.6.99	Cuer Urfa AS (FB), Erith AS (FB), Grangemouth Auction
11.6.99	Doncaster AS Auction
13.6.99	Bracknell AS (FB), Tameside AS (FN), Castleford (Y)
18/20.6.99	**BBC Gardeners World NEC Birmingham**
19.6.99	Bristol Tropical AS (FB)
26.6.99	AMGK (I)
27.6.99	St. Helens AS (FN), Workington (FS)
4.7.99	Thames Valley Catfish (A), Welland Valley (FB)
5/12.7.99	**Hampton Court Flower Show**
10.7.99	Port Talbot AS (FB)
18.7.99	BKA NE Yorks (BK), NE Goldfish Society (I)
25.7.99	Merseyside AS (FN)
1.8.99	Three Counties AG (A)
8.8.99	Grimsby & Cleethorpes (Y), Salisbury (FB)
15.8.99	KAAS (FB), Perth AS (FS)
22.8.99	Glenrothes AS (FS)
29.8.99	Union of Scottish Aquarists (U), Swallowfield AS (A), Tyne Tees (FB), US of A (U)
4.9.99	**FBAS General Assembly - Del/member cards for free admission to view Syon Park**
5.9.99	Alden AS (FN), FSAS Council Meeting, Wyke S (Y)
11.9.99	Bristol AS (FB), Hounslow AS (FB)
12.9.99	Cramlington AS, Silkstown (FN), South London AS (A)
17.9.99	Doncaster AS
19.9.99	NACG (F), Otley AS (Y)
25.9.99	NGPS (NGS)
25/26.9.99	IOW Koi Club (B)
26.9.99	Darwen AS (FN), Fair City S (U), NEFAS (N)
2.10.99	Goldfish Society GB (NGS)
3.10.99	Basingstoke AS (A), Grangemouth AS (FN), Halifax AS (FN)
10.10.99	Doncaster AS (Y), Washington AS & P (FB)
17.10.99	Kirkaldy AS, West Cornwall AS (FB)
23/24.9.99	**British Aquarist Festival, George Carnell Leisure Centre, Manchester (F)**
31.10.99	FSAS Annual C of C (FS)
7.11.99	Merseyside AS Auction
12.11.99	Doncaster AS Auction
21.11.99	FSAS Council Meeting, NACG Auction
4.12.99	**FBAS AGM - Del/member cards for free admission to view Syon Park**

NOTE TO SHOW SECRETARIES

The above dates are those available at the time of going to press. For the latest, most accurate dates and venue information (and trophy allocations where applicable), please refer to the Quarterly Supplement issued by the FBAS giving details of shows around the country. The Show Supplement is available, price 50p post paid from:

SHOW INFORMATION,

Dept. FW, 22, Flamsted Avenue, Wembley, Middlesex HA9 6DL

In order to provide the most complete service to all Societies, please communicate your show information to the same address.