AQUARIST & PONDKEEPER

AUGUST 1997

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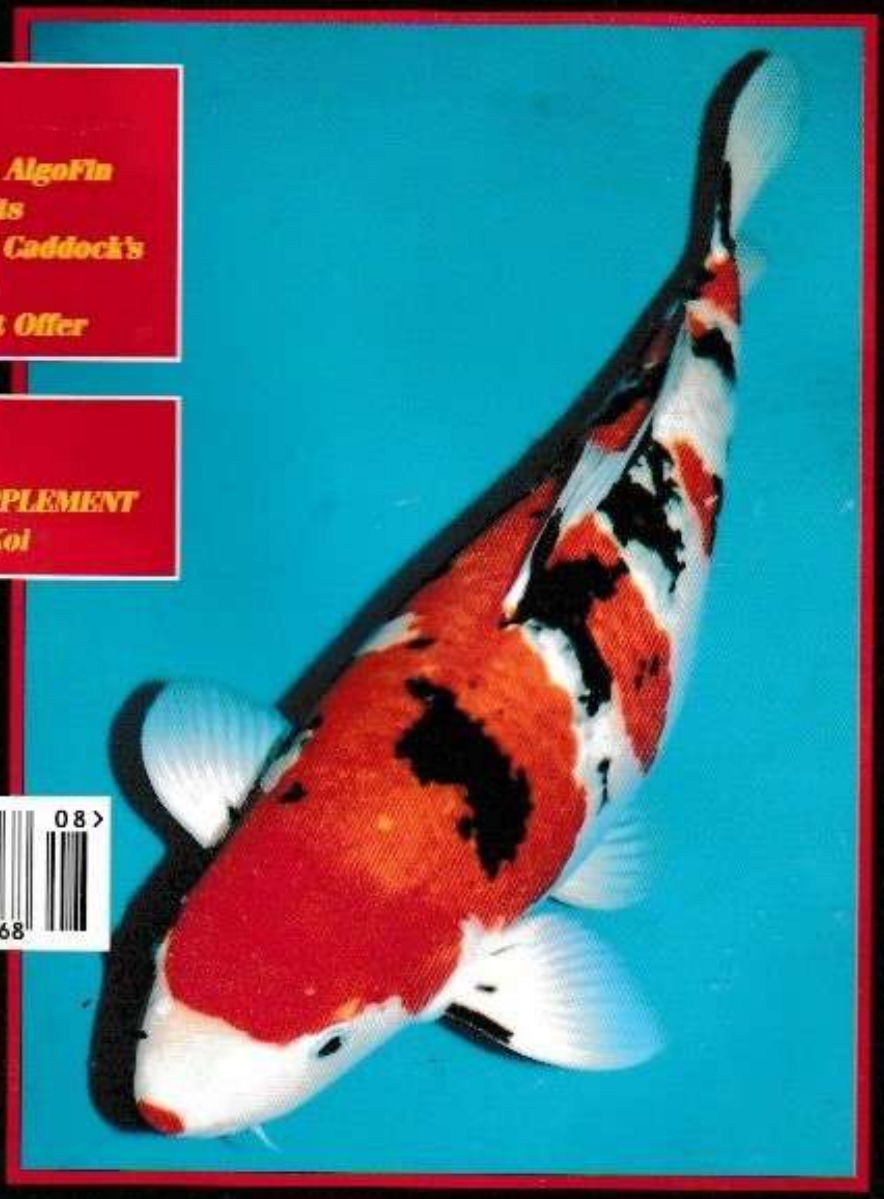

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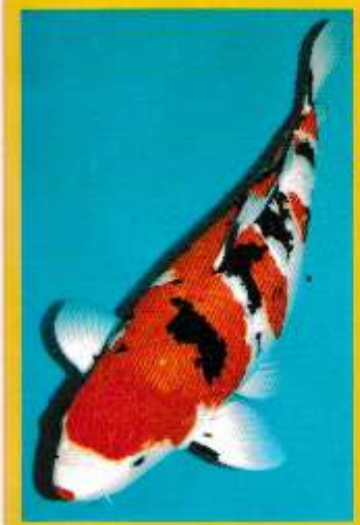

August is the time of year for Koi. See them in all their finery (like this Grand Champion at the recent Norwich BKKS Section Show), together with everything Koi-associated at the BKKS Koi '97 National Show at Billing Aquadrome (9/10).

PHOTO: DAVID TWIGG

COMMENT

Attending major Garden Shows, as we do, it always surprises me when water gardeners are quite glad to chat ove their problems but, in the course of the conversation, they drop in the phrase that 'Of course, I'm not a fishkeeper.'

It takes a long time to explain to them that, as a water gardener, they are dealing with a far different set of principles than those involved in simply growing terrestrial plants. What tends to be overlooked is that the living microcosm that is the pond is subject to so many varying conditions which have a 'knock on' effect to many other areas.

A similar situation often occurs at Fish Shows where, again, conservations can be quite revealing. Here, perhaps, the fishkeeper is at great pains to explain that they keep fish 'purely for pleasure', and wouldn't possibly be interested in exhibiting fish and as for joining a society, well, you'd tink all aquarist society members carried the plague (well, White Spot, at least!)

In both these situations, there seems to be a positive reluctance to see further than a limited distance which is a shame. Naturally, we want people to enjoy the hobby to their own capabilities and expectations but some knowledge of 'other areas' can do nothing but good — even though you may not wish to pursue the subject matter further.

It is often said that in fishkeeping more fish are killed through kindness (overfeeding, probably) than by any other action; perhaps we ought to include 'ignorance' as another contributory factor which, although might not exactly kill off fish themselves, it certainly can kill off interest in the hobby if it leads to early dissatisfaction or misunderstanding.

In this issue we aim to bring certain 'mystic' ardas into clearer focus — buying and exhibiting fish certainly to newcomers are often events which are crowded with pitfalls — and our experts are here to set you right.

EDITOR

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Nick Dakin looks at the absorbing world of Sponges

PHOTOGRAPHS BY THE AUTHOR

The Living Hotels

Red Tree Sponge (Haliclona compressa).

The only real connection that sponges have to the majority of the population is that you can often find the dead skeletons in the bathroom.

For those of you wondering if the title of this article has any connection with a new Stephen King novel let me assure you that, however strange the foregoing may seem, it is firmly based on fact!

The only real connection that sponges have to the majority of the population is that you can often find the dead skeletons in the bathroom or there might be one to clean the car with. To enlightened marinists, however, they are also an invertebrate species that can be highly useful in bringing both colour and interest to the marine aquarium.

ANCIENT ANIMALS

Sponges, of the Phylum PORIFERA, have changed little in the course of evolution and as a consequence they remain extremely primitive animals. Of the approximate 9,000 species, only 150 are

suited to a freshwater existence, whilst the vast majority are to be found in marine water. They are represented in all the oceans of the world but are most common in tropical and sub-tropical waters.

Sizes may range from a diminutive 0.4in (1cm) to a respectable 6.6ft (2m), with the largest species to be found in the Caribbean and, interestingly enough, Antarctic seas; these particular species once fully mature cease to grow further but may live for many years.

Sponges are to be discovered in a wide range of colours. The deeper water species are commonly white, green or pale-yellow, while the more numerous shallow water species extend this range significantly to encompass bright reds, yellows, green, blue, orange and purple. Although it is known that these colours are produced by pigments within the tissues their purpose is poorly understood. It has been suggested that adopted colours may act as warnings of distastefulness (many Sponges being toxic) or providing some protection from the potentially-harmful rays of the sun. Whatever the reasons, it detracts little from the beauty of these strange and absorbing (sic) creatures.

Sponges are sessile, filter feeders, and as such, are easy targets for a wide variety of predators.

ROOMS TO LET

Certain species of fish, particularly Angelfish and Butterflyfish, may feed upon certain species exclusively for the whole of their lives. Large Sea Turtles also find many Sponges irresistible, as do a host of Nudibranchs. Obviously, should such rapid predation go unchecked, Sponges would inevitably guarantee their own destruction; therefore, to guard against that possibility many Sponges generate toxins and are totally unpalatable. In addition, whilst it could hardly be termed as a deterrent, Sponges spread and multiply very speedily, in an effort to offset any losses.

The term 'Living Hotel' has been applied to Sponges frequently and with excellent cause, for it does indeed describe quite accurately what many species have evolved into. The many internal chambers make ideal ' apartments' for a whole host of marine organisms as diverse as Shrimps, Crabs, Worms and small, bottom-dwelling fish such as Gobies. The external surfaces are so convoluted and abstract that certain algae, mushroom and other colonial polyps find them perfect surfaces on which to settle.

Toxic Sponges are unwilling to tolerate this uncontrolled colonisation and the larval stages of invertebrates in search of a sessile home are killed should they attempt to settle permanently on the body of the animal.

SHAPES

Sponges do not necessarily conform to any particular shape as much of their development is governed by environmental factors such as space available, strength of water current and the substrate to which they are attached. In general, Sponges that grow in highly turbulent waters are more likely to form rounded or flattened clumps, whereas species developing in areas of slack water are taller and more branching in form. The many encrusting species will simply take on the shape of the solid object they may have chosen to grow over.

Those factors governing growth and the high variability of shape and form have made reliable identification somewhat of an impossibility and most species can only be

Blue Encrusting Sponge.

Yellow Sponge.

classified by an internal examination, as we shall see.

STRUCTURE

Sponges are unique amongst invertebrates in as much as they are without organs and have no true tissues, just a simple aggregation of cells incapable of movement. The interior is a system of, sometimes highly complex, canals and chambers that open to the surface through a series of visible pores; indeed, the phylum name Porifera means 'pore-bearer'. Many of the internal surfaces are covered by whip-like hairs, known as flagella, which cause fresh, nutrition and oxygen-laden water to be drawn into the sponge. Once processed, the stale water is then pumped back out through exit pores by the very same flagella.

Such is the efficiency of the filtering mechanism, even minute particles and bacteria can be absorbed, thus enabling Sponges to thrive in nutritionally-impoverished waters.

As previously mentioned Sponges possess a 'skeleton' which can be made up of calcareous spicules (rigid, supporting slivers), or a fibrous material called spongin (the very same material we may use at bath-time!) Such skeletons are not only beautiful but serve a useful purpose in the classification of sponges, being the only dependable method of identification.

REPRODUCTION

Sponges are capable of both sexual and asexual reproduction. Eggs are released and, once fertilised by sperm from another Sponge of the same species, drift up into the plankton layer to develop as larvae. At a pre-determined point of maturity, the larvae settle on the sea bed and grow into a new Sponge. More remarkably, complete Sponges can also reproduce from small pieces detached from a mature animal. This procedure is commonplace within the aquarium.

WATER CIRCULATION

As we have seen Sponges have their own system of water circulation. It has been estimated that a healthy Sponge 4in (10cm) high and 0.4in (1cm in diameter can pump five gallons (22.5 litres) of water through its body each day! A truly remarkable natural phenomenon.

In the aquarium a moderate to brisk flow of water around the Sponge is preferable at all times. Slow-moving, stale water, with a low oxygen content must be avoided at all costs.

RELIABLE SPECIES

Generally speaking, Sponges are fairly demanding aquarium subjects. Most species require water of the highest quality and stability. However, there are several species that are commonly available and can be recommended. All of the encrusting species seem to do well in the reef aquarium, especially the Blue Tubular Sponge (Adocia sp.), which, despite its common name, will grow as an encrusting Sponge, spreading over rocks and glass. The Orange Cup Sponge (Axinellid sp.) and The Red Tree Sponge (*Haliclona compressa*) have also proved to do well.

The marinist will also encounter numerous species sharing the same piece of rock with other corals. Many of these species will survive and grow quite successfully in the aquarium, although identification may be elusive.

FEEDING

The direct feeding of Sponges is not strictly necessary. If fish are kept, and fed, in the same aquarium, the juices from any frozen foods given will be enough to more than sustain the average Sponge. Any extra feeding may encourage pollution which will cause most Sponges to deteriorate.

LIGHTING

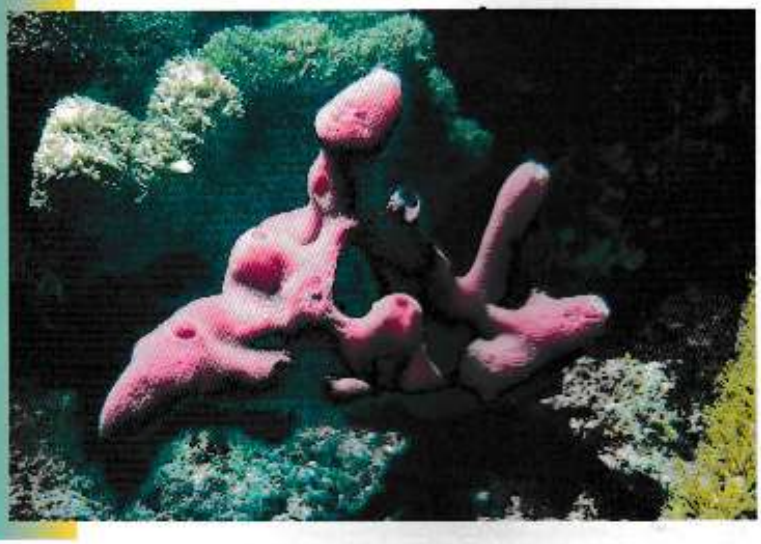
As a rule, Sponges are largely unaffected by the prevailing lighting conditions. However, relatively subdued lighting is preferable as they dislike being smothered by the algae normally encouraged by intense lighting. If bright conditions are required by other invertebrates sharing the same tank, then Sponges are best positioned in a shady position, perhaps within a cave or crevice.

HEALTH

A healthy Sponge will have no pale or transparent edges and the colour will be deep and rich. Avoid specimens that are in any way disintegrating. Sponges must never be removed from the water as air pockets can form within the Sponge leading to a premature demise. When purchasing a specimen, there should always be plenty of water in the travelling bag, certainly enough to cover the Sponge completely.

TANK CONDITIONS

pH: 8.2-8.3; Temperature: 70-78°F(21-25.5°C); Ammonia/nitrite: zero; Nitrate: preferably less than 10ppm; S.G.: 1.021-1.026; Dissolved Oxygen: 7-8ppm; KH: 7 dKH. A protein skimmer and activated carbon should be used at all times. A water change of 15-20 per cent is required every two weeks.



Purple Sponge.

Susan Stephenson looks at conditions which may upset your fish

PHOTOGRAPH BY THE AUTHOR

STRESS and Its Effects on Fish

Knowing possible causes of stress can help keep your pool a stress-free environment so your fish can live long and happy lives.

Most fish carry pathogens which can cause disease and most fish have immune systems which effectively attack those pathogens and so reduce the risk of serious problems. However, when fish are stressed the fishes' immune system is suppressed, pathogens are unchecked and thus can cause disease and illness.

A number of factors can cause stress including oxygen depletion, sudden temperature changes, spawning, changes in the pH (or the wrong pH levels), travel and handling.

If your fish seem lethargic and it is impossible to pinpoint the problem rock salt can be added to the water as a good temporary treatment for restoring vigour to fish. However, check with your supplier for the correct dosage and remedy type as the wrong dose can be fatal. In general, one pound of rock salt treats 100 gallons of water. Rock salt works by helping fish to restore their protective slime layer and electrolytes (a fish tonic if you like!). The medications are usually mixed with pool water before adding to the pool.

OVERCROWDING

Stress can also be caused by overcrowding. More fish in a pond than the residents are happy with can lead to aggression with the less aggressive fish losing out. Fish which would not normally be aggressive can start to compete with each other for space, females and food.

Overcrowding can also lead to oxygen levels falling. Over-crowding may be due to fish outgrowing their pond, natural breeding or the addition of too many fish to the pond. Unless the filtration system is adequate too many fish can lead to excess algae which feed on the waste products. As a rough guide allow 50cm of body length of fully-grown fish per square metre or yard of water surface. If it is possible, stock your pond in two stages, introducing half the fish eight to ten weeks before the rest. This allows the bacteria which feed on fish waste to increase in numbers sufficiently to be able to deal with so much. If too many fish are introduced at once fish waste is not dealt with efficiently, the water gets polluted and the fish starved of oxygen.

The pond water gets oxygen straight from the air and, during daylight, from the oxygenating plants below the surface. As the water warms up during the day, its ability to hold oxygen lessens.

Fish are cold-blooded and so increase in activity as the water warms; their body processes speed up and they need more oxygen but if the water hold less anyhow because it is warmer, and there are too many fish, they cannot get oxygen when they need it most.

When fish are stressed the fishes' immune system is suppressed and thus can cause disease and illness.

SOURCES OF STRESS

Sometimes oxygen depletion can occur only for short periods at the hottest time of the year. At night plants absorb oxygen and give off carbon dioxide. Therefore, the lowest oxygen levels may be towards the end of the night when the water is still warm and the plants are absorbing the remaining oxygen. It may be that on warm, sultry nights it would be advisable to leave a fountain or pump on to give temporary additional oxygen to the water. Fish short of oxygen will gasp slowly at the surface seeking relief. Besides reducing the numbers of fish you can use an air pump, operate a fountain, waterfall or sprinkle water from a hose to aerate the water.

Breeding season can be a major source of stress for fish. Koi spawn when the water temperature is between 55 and 60 degrees, usually in the Spring. The female swims rapidly over a spawning mat or through leaf masses of submerged plants and rubs against them depositing hundreds of eggs which are amber-grey and about the size of a pin-head.

A male goldfish develops a series of white tubercles along the sides of his gill plates in the breeding season and often along the leading edge of his front fins. The males follow the female and fertilise her eggs which she deposits on plant masses. Sometimes several males may follow a female all trying to fertilise her eggs. Unless a spawning mat or submerged plants for spawning are available a female can literally be chased until she dies from exhaustion as she searches in vain for a safe place to deposit her eggs.

Most of the eggs and fry will be eaten if left in the pond and this is fine if you want to maintain rather than increase your fish population. Goldfish eggs, for example, hatch after a few days depending on the water temperature and some will begin to show colour in under six weeks if conditions are ideal. The fry should be fed crumbled fish flakes and left alone if possible. If you want to transfer the fry to a nursery pond and the fish have used a spawning mat the mat may be lifted into a pool without fish once the eggs are laid. You can also make a nursery area sealed off from the rest of the pond by using a fine meshed basket. Once the fry reach 1½in in length they will be likely to survive outside the nursery.

HANDLING

In normal circumstances fish will increase their numbers until there is a good natural balance in the pond. If there is a sudden catastrophe and large numbers of adults are lost the following Spring will see a large number of fry survive but if there are already many healthy adults fewer fry will live to add to the numbers.

Handling is a major stress cause in fish. Not only is their breathing interrupted by removing them from the water but their scales, fins and bodies themselves are liable to damage and then afford entry to pathogens, so keep handling down to a bare minimum. They are best handled when conditions are warmer as in cold conditions although they are semi-dormant they are in fact more prone to stress from handling. Also, sudden noise, bangs or water disturbance can cause severe stress.

When introducing fish to a pond do not release them straight into the pond from the bag because they are very sensitive to sudden changes in temperature but float the unopened bag on the water surface until the temperature in the bag is the same as the pond water. When hot, shade the bag with paper. Then allow a little pond water into the bag before gradually opening it to release the fish. Do not keep lifting them to see them close to your face as this seems to cause the fish severe distress.

PRETTY ROBUST

The presence of predators such as large birds and cats can cause stress in fish populations so ensure these are kept well away from the pond area.

In general fish are pretty robust and will often surprise their owners by surviving major catastrophes such as leaks in the pond, someone falling in, major weather disturbances or even being 'fished' by a cat but, conversely, it seems sometimes relatively minor upsets can change the balance and habits of the pool animals and wreak devastation. Knowing possible causes of stress can help keep your pool a stress-free environ-ment so your fish can live long and happy.

Having ensured that the water is plant-friendly as suggested in Part One, one must ensure that the methods of filtration and heating are also conducive to good plant growth.

Although some notable exceptions exist generally undergravel filters cannot be considered plant friendly. The main reason for this non-compatibility appears to be because undergravels draw oxygenated water into the substrate, which is necessary for the filter to act as an aerobic filter bed.

Plants, however, prefer to have their roots in a low oxygen medium. This is because many of the soluble nutrients that plants need are oxygenated under aerobic conditions, and no longer available to the plant. Under low oxygen conditions they remain available and can be assimilated by the plants. With a good cover of plants anchored in the substrate the plants will feed some oxygen down through their roots into the substrate, preventing any areas from starting to rot.

NEGATIVE EFFECT

Reverse flow power filtration may have the same negative effect and any use of undergravels flowing in either direction will exclude the use of any substrate additives.

There is one positive attribute when using undergravels, and that is that they ensure that there is no temperature difference between the water and the substrate. When there is a temperature difference plant growth can be again disrupted. Gentle warming of the substrate can be achieved by the use of below tank heating mats, gravel heating wires or warm water carrying tubes. The only problem is that when a tank is located in a centrally heated room, or during the summer the heater may actually operate only very occasionally leading again to temperature gradients.

If you already own an undergravel plate and a powerhead these can be quite easily arranged to set up a water circulation system that will ensure that

Although some notable exceptions exist, generally, undergravel filters cannot be considered plant friendly.

no temperature differentials are allowed to develop.

All one needs to do is to position the undergravel on your tank base as normal, and insert TWO uplift pipes, one at each end. Then completely cover the filter plate with a sheet of plastic, such as a piece of pond liner material and, after ensuring the filter plate is totally covered, place on top the gravel as normal. The powerhead is then fitted to one of the uplifts but with the outlet an inch or two below the water surface, and without any venturi or aeration fixtures. The other uplift is fitted with a strainer, and is also terminated an inch or so below the water surface. When switched on the powerhead will draw water down the uplift fitted with the strainer and under the void now created under the substrate before being exhausted just below the surface by the powerhead. Thus the substrate and water are kept at an even temperature. Of course the undergravel will no longer provide any filtration but the circulation system can be altered to work with external power filters as shown in the diagrams.

POWER FILTERS

Power filters are now in common use and both external an-internal models are available. If they are set up as the manufacturer recommends the filter return outlet will be playing

Bubbles of oxygen can be seen forming on the underside of the leaves of *Microsorium pteropus*, oxygenating water far more effectively than any airstone.

Small echinodorus plants are often referred to as 'indicator plants' as their leaves quickly show transparent patches if iron is absent.

across the water surface or may be connected to a spray bar or venturi attachment. All these measures are undoubtedly fish friendly, but sadly not plant-friendly. The agitation of the water surface does help to ensure that plenty of air is mixed and diffused into the water, but at the same time carbon dioxide, vital to the development of plants is expelled. In tanks with surface turbulence the CO_2 level may be as low as 0.2 mg/l. Plants cannot be expected to thrive under these conditions.

It is advised that when power filters are used that the filter outlets are positioned well below the water's surface thus helping to ensure that whatever CO_2 exists in the water remains and can be used by the plants to photosynthesise.

Air driven filters or aerators have the same effect on carbon dioxide levels and should be excluded from the plant friendly aquarium.

If having read the last few paragraphs you are now worried about oxygen levels in the water if you abandon surface agitation you may recall that in Part One it was claimed that plants oxygenate water in a superior manner to other methods of aeration. During aeration by a diaphragm pump or by surface agitation the surrounding air is diffused into the water. This air may include a number of pollutants, especially if someone in the house smokes. The oxygen supplied by plants as a byproduct of photosynthesis is pure.

In a well-planted, healthy tank the aquatic plants are well able to provide more than enough oxygen, normally to saturation point which for water at 25°C is around 8-9mg/litre. Please note that a healthy tank with good plant growth is required for this to occur.

Another normal worry is that oxygen levels will drop at night-time when the lighting is off and the plants stop photosynthesising and begin respiring (a process where they release some carbon dioxide and take up some oxygen). It should be remembered that the amount of oxygen taken in and CO_2 expelled is but a fraction of the oxygen produced by day, and that the oxygen needs of your fish are far less at night-time when most rest. Provided that sensible fish stocking levels are adhered to then no oxygen shortage should be noted, although it will be lower in the morning than the evening. This fluctuation is the norm in natural waters so it should not cause concern in our aquariums.

Surface agitation and vigorous aeration also tends to make waters more alkaline which may undo all the good work done to modify unsuitable water.

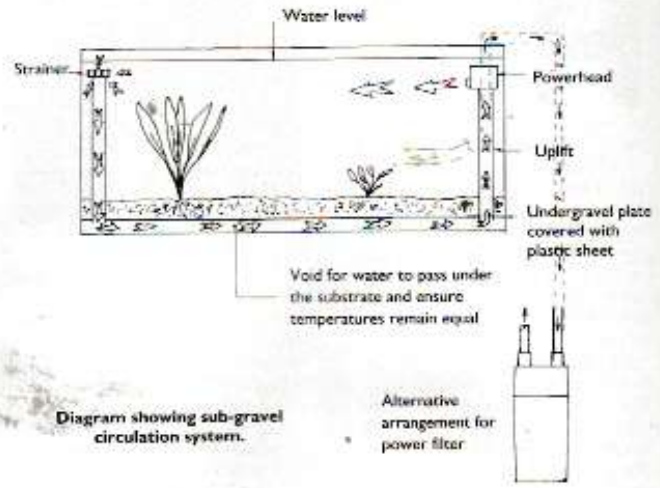


Diagram showing sub-gravel circulation system.

SUBSTRATE, DECOR AND FILTER MEDIA

Above all else the substrate and decor materials must be lime-free if neutral and soft water is to be maintained. The ideal aggregate size of the gravel is between 2-3mm, laid to a depth of 100-150mm at least.

There are many gravel additives available now, many of which are based on iron-rich laterite clay which originates from the tropics. It is a good idea to incorporate one of these in the bottom layer of the gravel, but be sure to mix the correct proportions. For example, many such products provide enough laterite for a 200 litre aquarium. If yours is only a 100 litre aquarium then only use half the packet. Don't think by putting the lot in that plants will grow twice as well, by providing an oversupply of nutrients you'll only be bringing algae problems! Some of these additives also include a growth hormone sachet designed to give the plants a boost when the tank is initially set up.

In the past it was often suggested that peat or loam be added to the substrate. Both the soils liberate elements into the water in an uncontrolled manner and should be generally avoided. Peat, or any other substances that are other than inert, should not be used as a filter media.

Adsorbant pads and activated carbons are also best avoided as they may remove plant nutrients from the water. Generally-speaking, for the plant friendly aquarium foam filter media that operate biologically, as described in Part One, are best.

Common Techniques that can Adversely Affect Plant Growth

1. Water surface turbulence caused by power filter returns and powerheads.
2. Air-driven filters and aeration.

Both the above commonly-used systems reduce CO_2 levels.

Plant Friendly Substrates

1. Must be lime-free and inert.
2. Ideal aggregate — 2-3mm, laid to a minimum depth of 100-150mm.
3. Undergravel filters should be avoided. They preclude the use of gravel fertilisers.
4. Substrate and water temperatures should be kept even, either by undergravel heating or below-gravel circulation.

Barry Goodwin gives his impression of showing Koi

PHOTOGRAPHS BY THE AUTHOR

A Matter o

The Kin Hi Utsuri that was Grand Champion at a recent BKKS National Show.

When the Editor asked me to write an article about judging at Shows I thought 'why me! There must be many out there better qualified to do this than I am', but when he explained that he wanted it looked at through the eyes of a non-Judge I then thought that it was perhaps a good idea after all.

Of course I participate in Shows myself, helping out on the Stand of a major dealer and although I do not show my Koi I am extremely interested in the ways that different Clubs approach the various aspects of the Show. This includes benching, water quality, judging and all the other facets of the organisation that go to make or break the Show.

PRINCIPLES

The object of showing Koi is one as old as time itself; mankind has always sought to prove himself or his possessions in all manner of competition throughout the ages and by so doing has provided a spectacle for the public to attend and enjoy.

With the showing of Koi it is a different kind of spectacle and one which has been responsible for attracting many newcomers into the hobby over the years, so captivating and beautiful do they find our 'living Jewels' that are on display.

Over the past few years the quality of the Koi exhibited at major Shows has gone up and up but it has to be said that the big winners usually have big price tags and such accolades are above and beyond the reach of most hobbyists. However, there are many Club Shows through-out the land where the standards are not so high and by choosing a more obscure Class with a smaller Koi there are prizes to be taken home by everyone. There are even home-bred Classes in some competitions. Classes for the most unique Koi, and even a Class for the ugliest Koi in some of the photographic competitions (I know this — I've won it!). So do not despair, if you wish to show your Koi then I am sure that by using a little common sense that you could come away with one or more prizes to take home.

VENUES

The type of venue for holding a Show is very important as this can have a great effect on the welfare of the Koi entered and, of course, the all important public attendance at the Show.

Ideally the Show would be held at an indoor arena and even the NEC at Birmingham was used in one year for a top-flight Koi spectacular but this proved to be enormously expensive and has not been repeated. One of the most important things about an indoor venue is of course that the Koi are protected from overheating in hot sunlight. The lighting is also important and it is by no means easy to get this right every time, in fact some organisers never seem to get it right! The lighting must be good for judging the Koi and it must be good for the dealers attending that they may display their Koi to the best advantage for sale.

The Norwich Show earlier this year was held under cover in an agricultural type of building on the Royal Norfolk Showground with transparent roof lights. These proved to be excellent and the space available was enormous.

Some other venues are on large grassed areas with Marquees erected and the Koi are displayed in a centre ring of vats where the light is always excellent. However, it is imperative that these vats are shaded and this is not always complied with. Unwelcome temperature fluctuation for the Koi can result when displayed in unshaded vats.

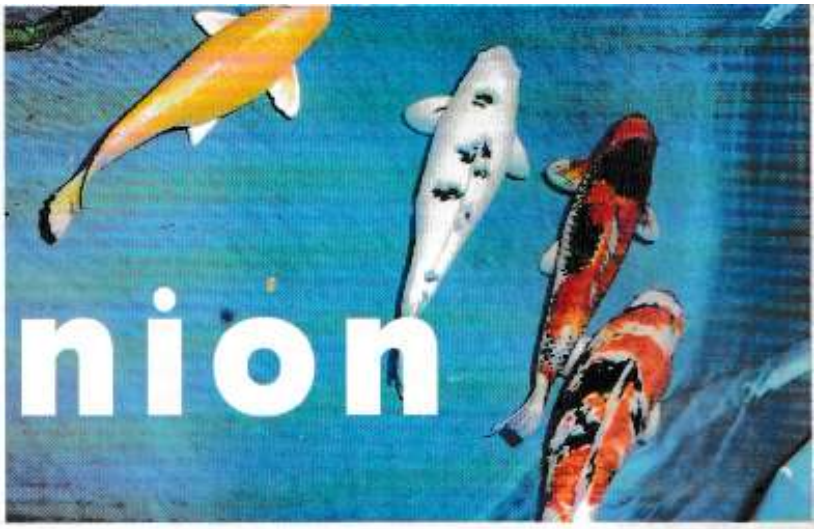
Public attendance at a Show can make or break it financially and it is, therefore, of utmost importance that there are good roads connecting it with the rest of the country. Koi keepers will travel, but if it is a long way then they may have second thoughts. Too few Koi keepers at a show will mean disappointed dealers who probably won't book for next year.

▶ Purified water storage 1997 style. At the Norwich Show these lined skips were used for bulk water storage. It is the amount of purified water that is held which can make or break the water quality stakes for the Koi.

WATER QUALITY

Before moving on to the aspects of showing itself, it is worth saying a thing or two about water quality, firstly because it is a hobby horse of mine and secondly it is the single most important part of the Show

f Opinion



Judging at Koi Shows through the eyes of a non-judge.

for the Koi; if not managed correctly it can spell disaster for some of the Koi who are entered — maybe not immediately but some time afterwards perhaps.

There are two problems: firstly, the water that comes in from the mains must be purified. Raw tap water with its chlorine and other additives is a stress agent for the Koi and stress leads on to other long term problems. Secondly, the ammonia excreted by the Koi via its gills will build up in the water and if this is not partially renewed every so often with stored, purified water of the same temperature, again stress and indeed direct physical damage to the Koi will result.

Whilst there are many Shows there are only some that I get around and so I can only speak from experience: there are some Show Committees who manage their water very well and some who do not. Perhaps the Club who has, in my experience, made the greatest strides in improvement is the Yorkshire Section of the BKKS who, under the guidance of Fred Harston and Phil Swallow, have a great set-up which must bode well indeed for the Koi that are entered. Other Clubs worthy of mention are the Essex Section of the BKKS and the Northern Koi Club who hold one-day Open Shows (where there are never any problems about water) and the Norwich Section whose two day Japanese Style show was beyond reproach.

BENCHING

Perhaps the second most important part of the Show for the Koi is the 'benching' procedure. This is the part of the Show where the Koi are all categorised, measured, and inspected for injuries and visible evidence of parasites and disease. This last requirement is very important as no Koi with infection or otherwise is allowed to be entered in a Show.

The benching is usually carried out by a Judge who is a member of the Club hosting the Show or, failing that, an invited Judge or someone whom the Club consider has the relevant experience to carry out such a task. Sometimes major dealers or other well known personages in the Koi world are selected for this. There will also be assistants who catch and handle the Koi and transport them to their respective Show vats. These must necessarily also be persons who are

Only when you have seen such fabulous Koi as these show winners will you begin to appreciate what the judges mean by 'imposing appearance'.

very experienced at handling Koi in every respect.

PRIZES

The prizes awarded for the winners at most Koi Shows are changing now and instead of just Trophies or Rosettes being awarded, prizes of some considerable worth are offered. At the Dealers Show at Luton, Japanese ornaments were given, at the Norwich Show pond equipment was awarded and at the Yorkshire Show a Keith Siddle original watercolour of Koi in a pond was given for the Grand Champion. Whilst trophies are always nice to receive I am sure that the winners greatly appreciate these prizes with which they can decorate their homes.

JUDGING

The judging aspect of a Show is that which causes a lot of confusion to the newcomer and also to some more experienced hobbyists. It is not uncommon for a Koi to be benched in the wrong category by the benching team and this is usually corrected by the Judges at the start of adjudication. For instance, it is not uncommon for modern Showas and Sankes to get mixed up. This may seem like a bold statement but some modern 'Kindai' Showas are without 'Matoguro', the black bases to the pectoral fins that are an identification feature of the variety. In this they are all too easy to confuse and some Koi at this year's Yorkshire show whilst being benched correctly were certainly causing confusion amongst the onlookers. Kawarimono is also another bone of contention.

Whilst some Koi may look very pretty and others which seem of lesser appeal to a casual onlooker may win the Awards, when you know exactly what the Judges are looking for then it will all make sense to you.

The attribute that is awarded most points (30/100) is that of body shape and it is here that I could show dissent with some Judges for it is clear (to me) that some winning Koi are more than of 'good volume' — they look to be just downright fat!

The second most important attribute (20/100) is that of 'skin quality' and by this they mean the white colour and not the actual skin — that would be very hard to see on a scaled Koi. It must be a deep, blank, snowy-white, with no hint of dis colouration or inappropriate colour marking. If the Koi does not have a white colour then the 'lustre' of the base colour is taken into account.

Further points for 'pattern' (20/100), 'quality' (10/100), 'elegance' (10/100) and 'imposing appearance' (10/100) are then evaluated by the Judges to give the Koi a total score out of 100.

A lot of people (including the Japanese Masters) say that a pond begins with Kohaku and ends with Kohaku but I feel that this is a matter of opinion. Amongst the other Classes, the Kawarimono in particular, there are many beautiful Koi and some I would place even above Kohaku. For instance, I have often said that I would rather see a really good Ochiba Shigure, or Matsukawabake in my pond than a Kohaku — any time. For me the Kohakus are there to provide that splash of colour at feeding time, but some of the Kawarimonos hold much greater interest.

When several good Koi are shown together, sometimes the Judges can have a difficult time, but first impressions go a long way and small demerits such as a shimmy or a splash of colour on a Kohaku's fin may not put it out of the running if it has many good attributes as well.

When considering 'colours' they must be clear and uniform and it can often be seen that reds sometimes have lighter-coloured scales or 'windows', whites can be yellowish or have black speckles, or the blacks are not flat and dark as ink with the required deep lustre. Such demerits will virtually ensure that a Koi does not get a prize. The distribution of the coloured markings, particularly with a Kohaku, is also important and ideally reds should not run over the nose or the eyes or into fins, etc. There should be a white area on the nose and caudal area (of a Kohaku) unless it is Kuchibeni (red lips).

The 'quality' of a Koi in adjudication is something a little more nebulous and can broadly be described as how all of the attributes used for judgement fit together as a whole and is something that a Judge becomes attuned to as he gains experience.

'Elegance' is also something that cannot be easily explained, but it is the impression that a Koi gives as it swims — are its fins correctly proportioned — does it swim well? Some of the other attributes also impart elegance such as a white area before the caudal fin on a Kohaku, and even the shape of the head will impress (or otherwise) as the case may be when scoring in this area.

Lastly, the 'imposing appearance' — does the Koi hit you as 'wow!?' To me, anyway, imposing can be the only description which could be applied to many of the Grand Champion Koi that I have seen (but not all!). There is nothing so memorable as a really imposing Koi and I can think of several examples which come to mind. There were the winning Koi of a few years back which belonged to Joe Wilmington. The fantastic Showa and the Kin Hi Utsuri which won the National Shows in those days were never to be forgotten. They have since been sold on to Germany and continue to impress on the continent.

Covered vats at a show as seen here at the 1996 Northern ZNA Show are a necessity for the Koi.

SHOW TYPES

Of course the judging can be influenced by the style of Show, as can the water quality, and there are two methods of showing Koi in the UK that are presently used — English-style and Japanese-style.

There is a further type of competition and that is the Photographic-style Show which some smaller Clubs hold annually.

Of the first two mentioned there are also two different forms, the 'Closed' and the 'Open' Show.

The Closed Show is put on by a Club for its members only to participate in and the Open Show is staged for anyone to enter their Koi from any Club or otherwise. Both styles of Show are usually open to the public, in fact Clubs holding an Open Show usually do so to (amongst other things) raise revenue for the Club.

JAPANESE-STYLE SHOWING

In a Japanese-style Show the fish from different competitors are mixed in the vats according to size and variety. This makes the Judges' job much easier for they do not have to walk between sometimes widely-spaced vats to note the attributes of perhaps two Koi that are vying for top honours. It is much easier to judge several Koi when they are swimming in the same Vat.

It also means that the water quality is much better because there are fewer vats to maintain and, therefore, less stress for the entered Koi.

ENGLISH-STYLE SHOWING

The English style of Show started when the scare over Spring Viraemia of Carp (SVC) descended on the nation a few years ago and it was decided that fish from different owners would not be mixed in the same vats. Unfortunately, this means that there are many more vats to maintain with all the associated logistical problems: the poor Judges have to cover many miles in a day to evaluate the Koi!

It also means that each contestant has his or her own vat, sometimes two, and their Koi are not mixed with any others from other contestants; the risk of passing on parasites and disease is thus kept to a minimum.

CAMARADERIE

Now very popular with many Clubs, the photographic-style of Show is gaining wider recognition. In this format the Judges visit the ponds of the entrants where the Koi are evaluated and notes made together with a video film and still photographs. These are then taken away and assist the Judges to make their final decisions. The prizes usually take the form of Rosettes or Cups together with Certificates. At some Clubs the photographs are then displayed and a Club Night is held where the members try to pick out the Koi that the Judges selected; the member scoring closest receives a prize. A video is usually made which the members can purchase.

Without doubt showing has become the mainstay of the UK hobby and without it the camaraderie that exists between many Koi keepers throughout the length and breadth of the land would not exist.

There is not only the competition that draws the crowds: bigger Shows usually incorporate a Dinner and Dance where friends from far and wide can congregate and share in the social side of this wonderful hobby.

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BUY LINES

NEW PRODUCT REVIEW

ESHA

Testing aquarium and pond water is vital if conditions are to be kept within optimum limits. Having said that, having various bottles of this and that and colour charts all over the place can lead to complacency or even to times of 'test neglect'.

A new import, and one which obviates the need for multiple bottles and also saves time as well, is the **eSHa Aquatest.** It comprises nothing more than a tin of 'dipsticks' which provide almost instant read-outs of nitrite, nitrate, pH and hardness. It takes no longer than a minute for the sensitised pads on the dipstick to change colour which are then matched to those printed on the outside of the container. A package sufficient for 125 tests retails for under £15.

• Details from: AQUA SOURCE INTERNATIONAL, 65 Rainsborowe Road, Colchester, Essex CO2 7JU. Tel. 01206 547959. Fax. 0171 681 1708.

INTERPET

For those contemplating installing a pond (visiting BBC Gardeners World Live and the Hampton Court Palace Flower Show might have inspired you) a lavishly illustrated full colour booklet, ***The Interpet Guide to Pond Care,*** *contains all the facts you need to know as to how to go about it. Topics covered include setting up and stocking a new pond and creating and maintaining a healthy pond. The trouble shooting section will add to your confidence and there's also a list of what pond-related tasks to do throughout the year.*

• *The booklet is available free from: INTERPET, Vincent Lane, Dorking, Surrey RH4 3XY. Tel. 01306 881033. Fax. 01306 885009.*

ADVANCED AQUARIUM PRODUCTS

A number of new freshwater and marine conditioners, enhancers and filter treatments are being announced through Advanced Aquarium Products.

Instant Amazon and **Living Water Vital** are freshwater conditioners made from micro-organic catalysts discovered in the Amazon. The difference between the two is that one recreates rain-forest conditions (suitable for Discus, Tetras, etc) for aquariums which generally require a pH of less than 7. Living Water Vital is designed for Livebearers, African Cichlids (as well as for brackish water species) where the pH is likely to be above 7.

Cycle Vital (in separate freshwater and marine modules) allows immediate adaptation of life to new systems and will re-energise existing set-ups, too. It is claimed that the beneficial bacteria contained (not exclusively Nitrobacter and Nitrosomonas dependent) also help to crowd out disease organisms.

Coral Vital is described as a 'reef life energiser' likely to enhance the growth of coralline algaes, Anemones, Sea Mushrooms and Sponges and promote coral polyp regeneration and reproduction. Again, saltwater pathogens are said to become dormant and non-infectious when Coral Vital is used.

Coral LSB is a live sand booster and living rock enhancer helping to energise non-photosynthesising microflora and microfauna and also accelerate the activity of natural detritus consuming organisms. Impaction of sand substrate is avoided and pore structure of living rock maintained; ammonia, nitrite and nitrate levels are reduced.

• Details from: ADVANCED AQUARIUM PRODUCTS. Tel/Fax. 01843 232302.

REFINE

The next time you want to impress someone try muttering 'montmorillonite clay' in their ear. The chances are, if they're Koi keepers, they'll immediately enter into a discussion with you about its virtues for its use is a most effective way to restore to your pond water natural minerals so essential to the health and well being of Koi. ▶

BUY LINES

NEW PRODUCT REVIEW

◀ *New from Refine, the calcium-enriched* ***montmorillonite clay*** *works in two advantageous ways. Koi food will be absorbed fully and (I hope you're not eating when you read this), the fishes' excrement — which will subsequently contain less waste — is mainly in liquid form so your filters have less work to do.*

The product comes in a very fine powdered form, somewhere between cement and talcum powder in its particle size; it can be added to the pond water (1 tablespoonful per 1,000 gallons) or even to food. Withholding treatment is advised during any necessary application of medication due to Refine's tremendous absorption rates which are normally seen to best effect in the reduction of ammonia, nitrites and nitrate.

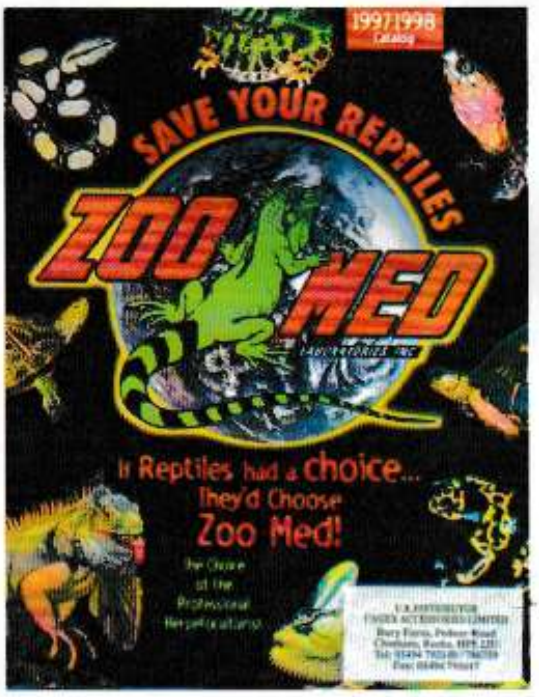
• *Refine is available at selected outlets throughout England and a list of stockists is available, together with hints and tips on its use, from: REFINE. Tel. 01626 61211.*

ZOO MED

Everyone marvels at how many reptiles can change their colours to blend in with their backgrounds. But a correct substrate should also provide other services rather than just be a background.

The new **Repti-Sand** from Zoo Med is an all natural substrate which encourages natural behaviours, is easy to burrow into and is an excellent heat conductor, too. Two natural colours (no dyes are used) are available. Desert White and Natural Red, in 5lb and 10lb bags. Desert, and semi-arid, reptiles and invertebrates will love it.

• Details from: CAGEX ACCESSORIES LTD, Bury Farm, Pednor Road, Chesham, Bucks HP5 2JU. Tel. 01494 786759. Fax. 01494 791617.



EHEIM

New water treatments are available from Eheim under the range name of ***Aqua Fluid.*** *The six units include Water Conditioner, Bacterial Starter, Water Cleanser, Peat Extract, Plant Fertiliser and Algae Treatment. All have a practical dosage dispenser which gives the correct dose with a press of the button. All are available in 100ml sizes although the Plant Fertiliser and Water Conditioner come in 250ml sizes as well.*

The eight Test Kits in the AquaTest range separately measure pH, General Hardness, Carbonate Hardness, Ammonium, Nitrite, Nitrate, Iron and Carbon Dioxide. A Lab Kit of Test Kits is also available.

Also new from Eheim is the CO_2 Set designed to supply a sufficient quantity for aquarium plants, in addition to the CO_2 Set (includes a pressure regulator with monometer, CO_2 Reactor and long-term Test Kit) there is available as a separate option an Electronic Controller for the system which incorporates a pH probe, main supply kit, pH control module and calibration fluids.

During your travels round the shops you are also likely to come across the new Eheim Fish Identification Labels on the display tanks; these not only identify the species by picture, common and scientific names but also give details of its size, origins, tank requirements, etc.

• *Details from: JOHN ALLAN AQUARIUMS LTD, Eastern Way Industrial Estate, Bury St Edmunds, Suffolk IP32 7AB. Tel. 01284 755051. Fax. 01284 760960.*

VIRESCO AQUA

A micro-organisms based product previously used to suppress algae on golf greens has been adapted to be used in aquatic applications. **Viresco Aqua** contains Bio System MS AQ-3, ten grams of which will treat 27 cubic metres or about 6,000 gallons of water. As well as micro-organisms the product contains humic and fulvic acids to stimulate aerobic, anaerobic and facultative bacteria at very high levels over long periods of time. But efficient microbial reduction of soluble nutrients rapid clarification of water occurs, alkalinity is also reduced and thus water softening occurs. An increase in uptake of food by fish and a decrease in the incidence of fish disease has also been reported. Algae blooms are suppressed and efficient bio-digestion of detritus is encouraged.

Although the dosage is very small — 1 gram will treat 600 gallons — it is recommended that care is exercised in its use to ensure adequate oxygen levels are maintained in the water. Currently under test is an ornamental lake containing Koi in no less than some 1.3 million gallons of water!

• For further details please contact: JOHN MCLAUGLAN HORTICULTURE, 50a Market Place, Thirsk, North Yorkshire YO7 1LH. Tel. 01845 525585. Fax. 01845 523133.

Neil Frank explains how to deal with the furry Beard or Brush Algae

PHOTOGRAPHS BY THE AUTHOR

Control of Freshwat

The most likely reason for Red Algae is introduction of contaminated plants or a bag of fish from a store tank.

INTRODUCTION

Among all the algae that can invade and gain a foothold in freshwater aquaria Red Algae, from the division Rhytophyta, can be the most frustrating to the hobbyist. This furry, thread-like flora attaches to various aquarium surfaces including the edges of plant leaves, filter tubes and even gravel. It may have many colours (purple, grey-green, black) and resembles beard hair or fur. In the aquarium literature this nuisance is often called Beard or Brush Algae. Baensch Aquarium Atlas' illustrate and talk about three forms. The long thread variety is called Beard Algae (once misprinted as Bear Algae!), the shorter thread type is called Brush Algae; and a third type is described as having very short threads and forms dark roundish spots. While most algae from this family are actually found in marine or brackish water environments there are a few

Red Algae in er Aquaria

species that inhabit freshwater (including the genera Audouinella). In nature these epiphytic freshwater Red Algae are found in fast moving streams which provide a constant, but perhaps low concentration supply of nutrients including CO_2. They also have the ability to attach tenaciously to all objects which makes them well suited to the moving water habitat. Unfortunately, they cannot be easily scraped or pulled from objects, thereby adding to the difficulty of their removal from the aquarium. In fact, when attempting to remove from plant leaves, the aquarist or even fishes may tear the leaf in the process.

On the positive side, some hobbyists find this algae an interesting and welcome addition to their tanks. It may offer a special charm to driftwood or rocks, especially with the undulating movement created by the down-wash of a filter outlet or powerhead.

The Red Algae is often the topic of discussion in aquarium literature. In a recent article published in *A&P*, Lilsa Sarakontu and I talk about the Siamese Algae Eater (*Crossocheilus siamensis*), perhaps the only fish known to effectively eat and essentially eliminate this algae from the freshwater aquarium. In addition to this very valuable fish, there are many other effective cures for the Red Algae plague.

◀ **A beautifully planted aquarium (in the Mizukusa — which means Water Plant — Club aquarium shopo near Tokyo) without any visible red algae or other algae.**

◀◀ **The less attractive Glass, or Ghost, Shrimp, found in North America and Europe (*Paloeomonetes* sp.) are also competent algae eaters.**

◀ **'Yumato numa ebi', the Japanese Marsh Shrimp (*Caridina japonica*) is used extensively in Japan to control red and many other algae. Shrimps must be used in large numbers to be effective.**

HOW DOES RED ALGAE GET INTO AND FLOURISH IN THE AQUARIUM

The most likely reason for Red Algae is introduction of contaminated plants or a bag of fish from a store tank with Red Algae. This can come in as some small filaments floating in the water, as water born spores or perhaps in the digestive tract of fishes. Once deposited into a suitable aquarium environment, they may become established.

It is unlikely that substrate additives, including garden soil or plain backyard 'dirt' is a source of contamination. I have used soil in some of my planted tanks for many years and never saw Red Algae in these tanks, even before I found the Siamese Algae Eater. I am also not aware of this problem with many other aquatic gardeners who believe that the iron, manganese and other nutrients derivable from soil can be very helpful for a plant tank, provided that all other conditions are correct and the plant density is sufficient. Perhaps this route of entry is plausible if the soil is was taken from a river bank or if aquatic sediment is used. Nevertheless, deposited Red Algae will benefit from the extra nutrients which can also originate from soils. If a complete set of nutrients are available in the water column from whatever source, algae will thrive.

Eliminate it before it enters the aquarium. First, the aquarist can attempt to avoid introducing Red Algae into an uncontaminated aquarium. This is most important if Red Algae is seen in the local area, say, in the local aquarium shops. Contamination from transferred plants is likely, even if the algae isn't clearly visible. In these situations a suggested approach is to 'disinfect' the plants to kill the Red Algae. It may also be helpful to avoid using any water from an aquarium shop (eg. acclimatise new fishes in a bucket) and quarantine new fish for a few days until they clear their digestive system.

Removing infected leaves is another good idea. In any event, removing some older leaves is often the suggested protocol to reduce the shock of trans-planting. With cases where slow-growing plants like *Anubias* have been exposed, however, all leaves may be covered and it becomes impractical to remove the affected parts.

Although what I am about to suggest sounds a bit drastic or potentially harmful it is actually quite safe and very effective. It also avoids the necessity to remove any leaves. The suggested procedure involves a two to three minute disinfection bath in diluted household bleach (one part bleach to 19 parts water). You can use the name brand products or the generic. Just get the ordinary bleach and do not get the variety with the added lemon scent. Place the plant in the solution (including one that is totally covered with algae) and gently circulate the bleach solution to ensure good coverage. The fine-leaved plants are the most sensitive and should only get two minutes, while the broad-leaved varieties including Java Fern, Swordplants and *Anubias* can take the full three minutes. Next, give them an immediate rinse in clean water. I usually have a bucket with clean water ready and I simply transfer the plant to the new container and leave it there for a few seconds. The previously tough algae is now dead, visible pieces can be more easily removed by rubbing the leaves between your fingers and the plants are now ready to go into their new home.

Fur-like Red Algae growing on the edges of the Amazon Sword Plant.

SUITABLE ENVIRONMENT AIDS PLANT RECOVERY

Some plants will later lose their leaves, but when placed into a suitable environment (good light, nutrients, etc), the plants will quickly recover and soon take off. As a bonus the bleach treatment (but perhaps with more than three minutes immersion) will also eliminate the green hair algae (*Pithophora, Cladophora, Oedogonium*, etc). Plants like Swordplants, Crypts and *Anubias* can take four minutes of the bleach treatment without too much damage. The tough-textured hair algae can be very resistant and really need four minutes. Fortunately, stem plants that can't take four minutes are able to outgrow hair algae, which usually attaches to old parts and doesn't seem to spread to the young parts very quickly. As many of us know, these algae can be just as big a nuisance down the road.

Bleach can also be used to remove algae from other aquarium objects including rocks, filter parts and even gravel. Of course this would be done outside the tank. Rinse everything very well and be sure to remove all traces of bleach. Your nose will be a good judge. Extra rinsing and even air-drying is suggested for porous or large surface area items like clay pots.

PROVIDE TRACE ELEMENTS TO THE PLANTS AND DEPRIVE THE ALGAE

If one or more plant nutrients are substantially reduced or completely eliminated from the water then the

algae will fail. This can be accomplished by managing iron which is one of the most important trace nutrients.

Iron can be provided to the aquarium in several ways — through feeding and subsequent mineralisation of detritus; with soil or laterite in the substrate, some from new water introduced with water changes, and with the addition of plant fertilisers. Sufficient iron is desirable, but too much is bad. While iron is needed for good growth of all plants, including algae, excess amounts will merely be extra food for algae and help it to thrive. Iron is often a limiting plant nutrient and it can be an indicator of the concentration of other needed trace nutrients.

Most iron in the aquarium (eg. from decomposing organic matter, mineralised detritus or from added tap water) will be bound to oxygen or organic matter and will be less accessible to algae.

Digested iron will be excreted as faeces and deposit in the substrate. The same is true for any iron oxidises, as contained in soils or laterite.

Limit the amount of added soluble, iron bearing aquarium plant fertiliser. Rooted plants can derive iron from the substrate in addition to getting it from the water. However, algae (and floating plants) can only get it from the water. So, one strategy is to reduce the amount of added iron.

Many fertilisers contain a chelated form of iron which is designed to keep the iron in solution. The recommended dose is often designed to produce a concentration of approximately 0.10 ppm and may be based on daily or weekly additions. Unfortunately, label suggestions are based on some typical condition which may not be ideal for your situation. Depending on the nutrient uptake based on density of plants, their general health, growth rates as well as the existing reservoir of iron in the aquarium, the target concentration may be too high. Therefore, some trial and error may be needed to determine the correct dosage for your situation. I also note that the iron concentration is also an indicator of the amount of a variety of other trace element nutrients used by both higher plants and algae.

IRON MUST BE MADE AVAILABLE TO PLANTS

Add iron directly to the substrate. A final way to reduce iron in the substrate is to not intentionally add any iron bearing fertilisers to the water. How-ever, iron must still be made available to the plants. The latter reason is why good plant growth can occur in an established tank but not in some newly established ones. Fish excretions will supply most other nutrients, so many aquarist can have virtually algae free plant tanks with good lighting and regular feeding of the fish. In all of these cases, the insoluble iron from the soil or from mineralised detritus can be chemically modified (reduced) in the oxygen free, anaerobic areas of the substrate and become accessible to the plants through their roots. Small amounts of iron and other trace elements in the water will still be soaked up by the plants, thereby helping to starve the algae. With this strategy supplemental additions of iron may become necessary when the plants are well-established and the roots totally fill the substrate. Then it becomes difficult for the plants to get their iron from this source. Hopefully, by this time all the algae problems are under control.

I'll be looking at more methods of combating Red Algae next month

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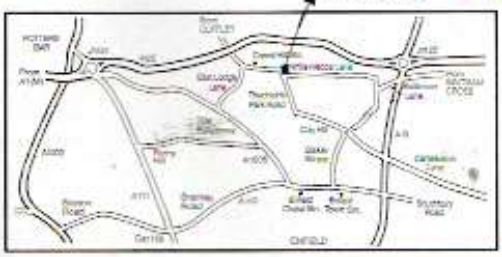

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CHAWGC — AUGUST

Caught in the Net

Kathy Jinkings trawls in another catch from Cyberspace

Although the majority of aquarists keep freshwater fish, thus avoiding the difficulties of preparing salt water and catering for sensitive fish, the majority of fish species are marine, inhabiting the 71 per cent of the Earth's surface covered by ocean. The fascinating range of life ranges from the familiar and beautiful reef fish and corals to strange fantastic creatures that live in the most inhospitable parts of the seas. This month we examine what the Internet has to offer in the ocean depths.

Marine environments get a more comprehensive press than freshwater ones, and TV programmes and books are easier to find. However, even the most knowledgeable will find something new at Ocean Planet. This site is an online version of a travelling exhibition, and its scope encompasses everything imaginable on and in the seas. This is delivered complete with pictures, sounds, and information on levels suitable for both children and adults, experts and novices. Just a few of the items on offer include a man who makes his living hunting giant squid, information on creatures who make their homes in the scalding acidic waters near thermal vents, pictures and information on the people who make their living near and on the sea, the potential healing powers of shellfish ... the list goes on and on. This site is a must visit for people with even a passing interest in marine life, but be warned — you can easily spend hours wandering through the exhibition!

Start your exploration at **http://seawifs.gsfc.nasa.gov/ocean-planet.html**

If you've managed to see all of Ocean Planet, another site worth a visit is at Safari Splash! at **http://oberon.educ.sfu.ca/splash.htm.** Make sure to call in cheap rate, as this site provides films and big graphics of ocean life photographed in Barkley Sound, which do take a long time to download.

This is a good site for younger viewers, as the information is easy to read, and some films come with a spoken commentary as well. Even the menu picture can be downloaded as an animated scene!

The Coelacanth was long presumed extinct, as it was known only from fossils. An illustration of the likelihood of other unknown or 'extinct' creatures still surviving in the depths, the Coelacanth was rediscovered in 1938. You can read all about this ancient fish at 'Coelacanth: the fish out of time' at **http://www.dinofish.com/**

Lots of other fish have really become extinct, but you can take a tour of the Jurassic Reef Park at **http://www.uni-stuttgart.de/UNIuser/igps/edu/JRP/JRP_english1.html.** This is absolutely fascinating and well worth a visit. The information on this site would make it a valuable reference tool for a project, or just worth revisiting for interest. With this in mind the site is available as a zipped download, so you can keep the phone bills down and still have all the information to hand. Although lots of facts are packed in here, it's all written in an easy-to-read style, with lots of pictures of fossils, animals currently living which existed in Jurassic times, and artwork. Maybe not as startling as the T-rex in Jurassic Park, but a lot safer!

More serious, but equally fascinating, are the articles provided on the Life in Extreme Environments page, at **http://www.reston.com/astro/extreme.html.** Here you can read about fish with anti-freeze in their blood, and creatures living in boiling water. Stay clear of this if you want pictures and fun text though, as this is all from scientific journals.

Andrew's Deep Sea page, at **http://www.vims.edu/~asuntsov/deepsea/deep.htm** is still very much under construction, but there's already some nice graphics here showing the weird and wonderful fish that inhabit the dark depths of the ocean. He's working on adding some scientific information and filling in the blank pages, so it's worth 'bookmarking' this for future reference.

The unfamiliar always seems more interesting, and our own marine life often gets ignored in the enthusiasm over brightly coloured tropical reefs. The British Marine Life Study Society pages, at **http://ourworld.compuserve.com/homepages/BMLSS/homepage.htm,** do a good job of remedying this. Articles such as 'Why do Crabs walk sideways' and 'Seal Pup rescue' present information in an interesting and easy to understand way, and 'From Rockpool to Aquarium' gives an easy to follow guide for those sufficiently interested to attempt keeping the creatures at home. These are the home pages of a Club, so if you are interested you can join and receive regular Newsletters. There are two parts to the pages, from England and Scotland, so be sure to follow the links and see both.

A more graphic view of our native waters can be seen at the UK Underwater Wildlife pages, at **http://www.gla.ac.uk/~gbza62/contents.html.** The beautiful pictures here should dispel any idea that British marine creatures are all dull, brown and boring — here are native Starfish in brilliant reds, strange misshapen Sponges, Crabs and Sea-squirts, and, of course, the fish.

If you have now been sufficiently enthused about our native fauna, you could follow up with a visit to one of the many marine public aquariums in Britain. On the other hand, if you are short of time, you could visit Deep Sea World, the National Aquarium of Scotland, on the Net. At **http://www.deepseaworld.com/** you'll find a brief tour explaining what is likely to be found in different marine habitats — caves, sandy flats, kelp forest, etc, the school pool which provides quick snippets of information and projects for children, and Find-a-Fish which is a quick look up for information on some of the more common species. For the patient there's also a Shark video to download.

Marine clubs don't appear on the Internet as often as the freshwater ones, so it's nice to see that Matthew Chamberlain is setting up a page for the Leicestershire Marine and Reef Society page at **http://ourworld.compuserve.com/homepages/Matt_Chamberlain/LMARC.htm.** Matthew already has an excellent home page of his own at **http://ourworld.compuserve.com/homepages/Matt_Chamberlain/reef.htm,** which has lots of information all about reef tanks. The comprehensive and well-written information here covers every aspect of Matt's setup from equipment to inhabitants, and is well worth a read by anyone thinking of setting up a marine tank, or indeed anyone interested in reef tanks. There are lots of good photos here, (all taken by Matthew), a books listing, and there's a freshwater page under construction, too.

Anyone interested in keeping marines could do worse than have a look at the newsgroups **rec.aquaria.marine.misc** and **rec.aquaria.marine.reefs.** Newsgroups are large chat areas where anyone can leave a message, and anyone else interested can read it. Because they are open to everyone, they do tend to suffer from messages which are nothing to do with the topic, inviting you to 'make money fast' but newsgroups are great sources of information and a way to make friends with other people who share your interests. Please don't send any money to anyone as a result of a newsgroup message, as these schemes are worthless at best and downright illegal at worst.

Next month we'll be back to freshwater fish, with a look at some of the facilities the Net has to offer for the keepers of livebearers.

Kathy can be contacted at ***kathy@ckfc.demon.co.uk*** *and the British Aquatic Resource Centre can be found at* ***http://www.cfkc.demon.co.uk***

KOI

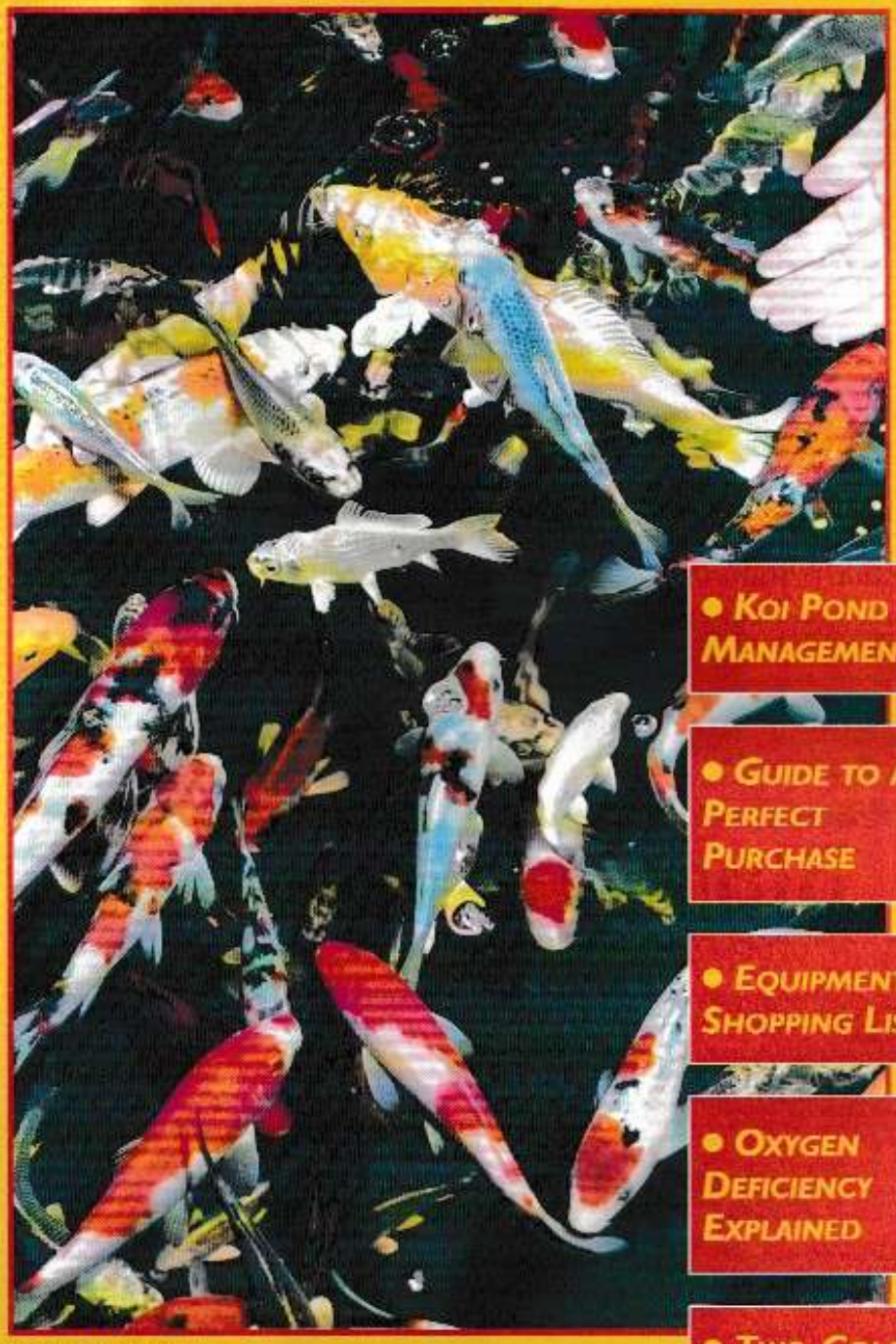


PHOTO: MR. & C. PIEDNOIR

KOI-ZING

- KOI POND MANAGEMENT
- GUIDE TO A PERFECT PURCHASE
- EQUIPMENT SHOPPING LIST
- OXYGEN DEFICIENCY EXPLAINED
- TWO-COLOUR KOI EXAMINED

AQUARIST & PONDKEEPER

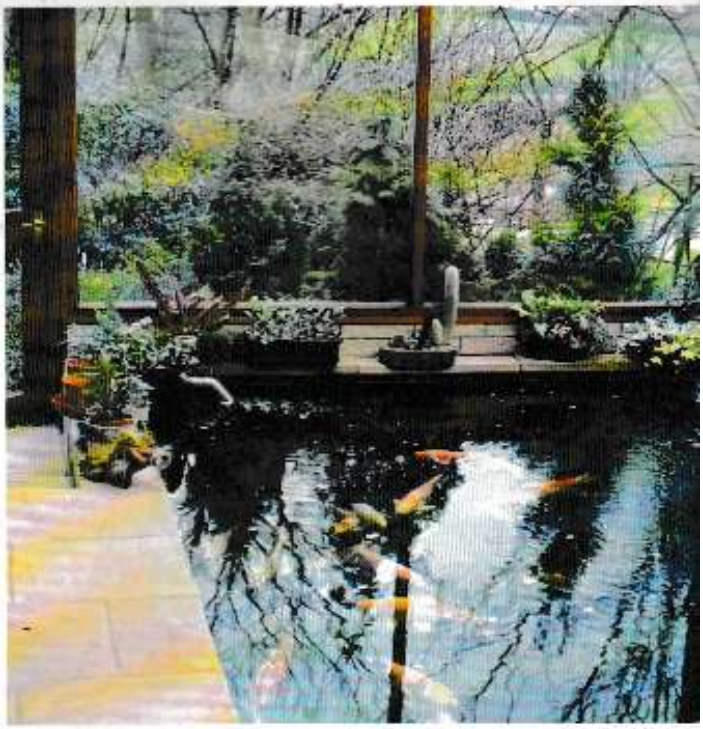
AN PUBLICATION

Roger Foggitt looks at the Koi pond on behalf of newcomers

PHOTOGRAPHS BY DAVID POOL

BIG Diffe

Correct conditions are particularly necessary when planning a Koi pond



The phone rings. "Hello?" "Yes, hello, er, I'd like to build a pond, but I don't really know where to start. Can you help?" "Certainly no problem, what sort of pond?" "Err, I don't really know, one with water in and I want lots of fish — big fish, VERY big fish!" "So you'll be looking at a Koi pond then!" "Koi — are they like Goldfish then?" "Well not really, let me explain ..."

This type of call is similar to many which we receive at the Tetra Fishkeeping Information Centre and really summarises one of the main points to consider when planning a new pond. Just like setting up a tropical aquarium ensuring that conditions are correct for the different species of fish you want to keep, the same is true, but in a broader sense, to the pond. This is particularly the case when planning a pond for Koi.

To explain why, we really need to look at the fish themselves and compare a species which can be considered as a general garden fish, to one which requires more care and attention to its needs, ie, the Koi.

GOLDFISH v KOI

The Goldfish (not the credit card version) although it is quite closely related, is very different to the Koi in many ways. Firstly, the maximum size of the Goldfish will not generally exceed 1lb in weight and 6-8in in length. However, Koi can quite easily exceed 7-8lbs in weight and 20in in length. This makes a lot of difference when considering the ultimate size of the pond. Obviously a large fish will require much more swimming room and the pond will be correspondingly larger. As fish do not just move in one plane so the vertical depth of the pond will also need to be greater in the Koi pond than in the traditional garden pond. Generally, then, the Koi pond starts at a minimum of eight to ten feet in length and six feet wide with a minimum depth of three feet. (Minimum of 1,000 gallons in capacity). These sizes are obviously guide lines and the larger the volume the better, particularly if large numbers of fish are going to be held.

The larger volume of water also serves another function. Firstly, any fluctuations in water quality are distributed evenly throughout the water, effectively 'diluting' down any changes which would be greater in a smaller pond. This is particularly important in the Koi pond containing large numbers of fish, as the Koi is a notoriously messy feeder excreting a substantial amount of waste for its body size. The effective concentration of waste products in the water at any one time is lowered the

rences

greater the volume, so stabilising water conditions.

Larger volumes of water are also more stable in terms of temperature as the high specific heat capacity of water means that a large amount of energy must be supplied (increase in temperature) or released (decrease in temperature) to alter conditions.

The subject of water then brings us on nicely to another consideration and that relates to filtration of the Koi-only pond. Koi, unlike Goldfish, are not as hardy as you may first think and are much more sensitive to water pollution so a Koi pond must have a filtration system that ensures that water quality is kept at an absolute premium at all times.

TWO MAIN FUNCTIONS OF A FILTER

Whilst in an article of this size it is not possible to cover all the filter technology available today, in basic terms a filter performs two main functions in any aquatic system be it pond or aquarium: the first is to remove any suspended debris from the water which would otherwise make it cloudy and potentially break down to form ammonia and also deplete oxygen levels in the water. This is normally carried out in the small pond filter by some kind of mechanical filtration media such as small brushes or more usually expanded foam sheeting or blocks.

In the Koi pond, however, due to the large volumes of water passing through the filter other methods are now more usually used in conjunction with larger versions of the brushes and foam sheeting methods mentioned already. These normally take the form of large 'vortex' units which basically act as settlement chambers. The waste collected in these chambers is then easily run to waste by opening a series of drain valves at the base of the unit.

The second function of any filtration unit is to remove harmful toxic compounds excreted into the water by the fish themselves and is carried out by bacteria which naturally occur in the aquatic environment (biological filtration). These bacteria form slime coatings on any surface in the pond and consequently the greater the surface area available to the bacteria the greater the filtration capacity.

Obviously, because the Koi pond is already quite large, the Koi keeper does not want an enormous filtration system as well so biological filtration 'media' have been developed which give a large surface area to volume ratio — meaning that a huge amount of surface area for the 'purifying' bacteria to colonise can be supplied in a relatively limited space. The whole process of filtration can be considered as being the 'sewage treatment works' of the pond and is essential in the Koi pond which is

◀ **Koi pond in conservatory.**

▼ **Multi-chambered filter for Koi pond.**

generally highly stocked.

In the established garden pond, which has a balance in terms of the numbers and biomass of fish and plants, the need for such a complex filter system is reduced as the balanced numbers of organisms in the pond allows the cycling of these harmful nutrients to take place with no build up of products within the cycle (the nitrogen cycle). The filter in such a pond is basically there to aid the natural processes occurring in and is often only used when waste production is at a maximum, ie. during the Spring, Summer and Autumn.

External pumps for pond.

Koi in pond.

THE NITROGEN CYCLE

However, a Koi pond is just that — a pond for Koi and, in the majority of cases, the Koi pond is devoid of any plants, not least because a large Koi is a destructive beast and will damage and dig up most popular pond plants given half the chance. This means that one essential product of the nitrogen cycle is not removed from the water — one which is an effective plant fertiliser and in the balanced natural or garden pond is rapidly absorbed by plants causing no problems. This product is known as nitrate and as many Koi keepers know is one of the favourite nutrients of one of THE major headaches of most pond owners — algae.

Although nitrate on its own, it is utilised by algae is not the only nutrient which stimulates algal growth. Phosphate is another nutrient generated in any pond system and when both nitrate and phosphate are available as free nutrients algae have a party.

It is for this reason that another important piece of equipment is found on the fish-only Koi pond — the Ultra-Violet Clarifier. This effectively kills the single-celled algae which 'bloom' in large numbers to form 'green water'. These dead cells are then removed by the mechanical filters mentioned earlier and the water is left crystal or 'gin' clear.

Due to the build up of nutrients which, in the fish only pond, lead to algal growth another piece of equipment that is becoming extremely popular in the Koi pond system is the 'vegetable filter'. This is simply a channel through which water is circulated from the main pond and in it are kept fast-growing plants such as Watercress. As they grow, these then remove some of the nitrate and phosphate from the water reducing algal growth considerably.

It is not surprising

that due to the size of not only the pond but also the associated filtration system and equipment that the construction of the Koi pond is not a small undertaking. In many cases the Koi pond is constructed on a thick base of reinforced concrete to support the weight of the water (the water alone, in a 1,000 gallon pond weighs in excess of four and a half tonnes) with the sides being built of rein-forced concrete blocks, covered with a concrete screed and then coated with fibreglass or lined with a flexible liner to waterproof and give the pond its good looks.

START OF THE STORY

During construction all the associated pipework such as bottom drains and surface feeds are all built into the overall construction so planning of where these go before you start can remove much heart-ache at later stages of construction. All in all this leads to the undertaking of a Koi pond being much more expensive and time-consuming process than digging a hole and lining it with butyl or a pre-formed pond. However, ask any Koi keeper what he felt like when the pond was finally finished and the fish were in place and the phrases 'very satisfying' and 'it's all been worth it' are common-place.

This is just the start of the story though. With many pond filtration systems being up to half of the volume of the actual pond itself the whole project can be enormous. And the price? Well, you know what they say — if you have to ask, you can't afford it! The basic price for the average garden pond with all associated equipment, fish and plants is probably around the £400 mark for a medium-sized pond. For the medium-sized Koi pond you can probably add another nought and you may be at just about the right figure.

However, do not despair. The Koi ponds of which I talk are the Rolls Royces of the pond world and to keep Koi you do not necessarily have to go to the trouble and expense described above. Koi can be kept in a flexible-lined pond and even a pre-formed pond as long as you follow the rules about giving them enough depth and space in which to swim, and ensure that the filtration system is good enough to keep water quality at a premium.

Maintenance of the Koi-only pond also differs quite dramatically to that of the usual garden pond.

LET NATURE TAKE ITS COURSE

This is really due to the fact that in the garden pond we are really allowing nature to take its course and as long as things like silt build-up do not get excessive then there is little to do apart from feeding the fish and keeping an eye on their health, trimming back plants if they require it, regular water changes and testing and the usual seasonal jobs like cleaning, keeping an area clear of ice in the cold weather and so on.

In terms of maintenance the Koi pond really requires much more attention. This is because, like any 'artificial' holding system, things are on much more of a knife-edge balance, the balance coming from careful attention to feeding, filtration, aeration and other important chores.

Daily maintenance normally includes the flushing of mechanical filters such as vortex chambers and sand filters to remove any accumulated debris before it breaks down, potentially polluting the water. This is also tied in with flushing 'bottom drains' to remove accumulated silt and debris from the bottom of the pond. Feeding can also take some time in the Koi pond as there are generally more hungry mouths to feed and because it is the best time of day for the Koi keeper to get close to his prized specimens. Ensuring that all the associated bits of equipment are running correctly, also fall into the 'daily' check routine.

Then there are the weekly chores such as water testing. Let's face it, we can't actually see what is happening in our filter so the only way of monitoring what is happening is to regularly test the water to check everything is working correctly. Health checks are also important and many an hour can be spent simply checking that each fish is at peak fitness. Water changes also play a major part but in the Koi pond these are made almost continuously as water lost through cleaning, flushing filters, etc, is regularly being added, in many cases automatically.

UNDERSTANDING THESE BEAUTIFUL FISH

Although the maintenance of the Koi pond may sound a little harrowing it really only takes a few minutes each day to carry out, giving you plenty of time to enjoy the fruits of your labour.

Finally, there is a view that Koi keeping is a hobby of the rich and shameless. This is not true, the Koi hobby is open to everybody but before you start on what can be an all-consuming pastime, it is important that you have an understanding of the requirements of these beautiful fish so that you too can become totally en-grossed in this fas-cinating hobby with the minimum of fuss.

UV unit and box filter.

Barry Goodwin looks at buying Koi and points out some pitfalls along the way

PHOTOGRAPHS BY THE AUTHOR

We'll Take That One!

This picture and the one overleaf show Showa viewed from above, but please look more closely as when looked at from the side this Koi can be seen to have a large infected wound. Note also the eroded and split fins; all of these are danger signs to heed when buying Koi.

It is always a very pleasant experience, buying a new Koi that is, but this event does not always have the pleasant outcome that we hoped for.

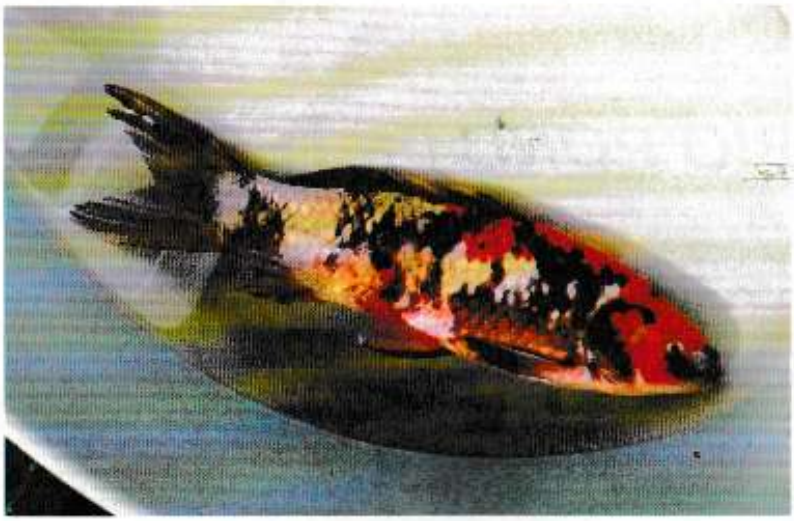
For the newcomer it makes a nice day out, down at the Koi dealer or the garden centre with his or her spouse, looking at the plants, perhaps with lunch out and going home at the end of the day with a new Koi or two which are put straight into the pond; they soon make friends with the other inhabitants and everything is tickety-boo! A few days later a different picture emerges, the new Koi cease feeding and start to hang around near the surface of the pond and soon they are in real trouble — one of them dies. A few days later they notice that some of their existing Koi also go off feeding and start to hang around in a similar manner to the newly-introduced Koi and soon two of them are dead also.

It is always a very pleasant experience, buying a new Koi that is, but this event does not always have the pleasant outcome that we hoped for.

ACCLIMATISATION AND QUARANTINE

What had gone wrong? Well, the biggest mistake of all was that the Koi were purchased and taken straight home and put into the pond without any period of acclimatisation or quarantine having been observed and this is probably the main reason for the largest amount of Koi deaths shortly after purchase.

A period of acclimatisation with the Koi segregated in a separate system is essential to prevent the stressful effects of purchase, transportation and introduction to a new



- Koi that show signs of physical damage are also to be passed up.

Many injuries that Koi sustain in transit from their foreign origination will not readily heal because of the adverse circumstances and stress of transit. What seems small in the dealer's vat could very soon develop into a major problem when you get it home. Even split fins come into this category, for you do not know the history of the Koi which could govern its stress level and its chances of recovery.

environment from adversely affecting the new Koi and preventing any disease or infection that they are carrying from being passed on to the pond. This period can be observed as quarantine during which the Koi are observed to see if they exhibit any symptoms of parasites being present and if noted, the system should be treated with an anti-parasite. They are also observed for signs of disease and the appropriate action followed if this is noted.

In our hypothetical pond the new small Koi could have died from several things:

- They could have succumbed to a pH difference between the dealer's quarters and the home pond. Small Koi will not readily adjust to large pH swings and develop conditions known as acidosis or alkalosis which can be fatal.
- They could have been stressed by the change of water chemistry or even a change in temperature which encouraged any parasites present to multiply out of control, particularly the White Spot parasite which can be rapidly fatal, or Trichodina, Costia, or even Chilodonella which is becoming more and more evident.
- They could have been carrying disease which was triggered into action by the environmental changes mentioned above.

The existing Koi then contracted whatever was brought in by the new Koi and suffered a similar fate; Rule Number One is, therefore, when you are bringing in new Koi ALWAYS ACCLIMATISE AND QUARANTINE THEM FOR A SUITABLE PERIOD OF TIME.

However, life is not as simple as that, and there are many things to look out for when contemplating a buying expedition and if you are to have success then you must heed them all.

KOI FOR YOUR GARDEN POND

If you are just looking for Koi for your garden pond with no thoughts as to showing them your task is a little simpler but certain ground rules still apply. You must look for traits that will tell you whether or not the Koi is well bred such as:

- Does it have a large head and thin body? If it does then this could indicate a couple of things to you.
  (a) *The Koi could be diseased in some way or it could be harbouring parasites.*
  (b) *The Koi could be genetically imperfect and the shape will just get worse and worse as it grows older. Always look for a Koi that is well-proportioned — don't let a pretty pattern and colour blind you to this more important aspect — and you should get a better, healthier Koi.*
- Beware of a Koi that sulks in a corner of the vat, this one could be harbouring just the problems that we spoke of earlier with our small Koi that died.
- Even a Koi that is not actually sulking but swims apart from the others could be nursing problems.
- Beware of pectoral fins that are not the same size or shape as each other, they could have been damaged or infected and have been trimmed by the dealer. This could so easily break out into infection again, so pass these by as soon as you notice them.
- Raised scales are another danger; they may be due to a knock and may recover easily or they could be infection that is setting in from earlier parasite damage to the body. This is then a lot more serious and very possibly beyond your prowess to recover.
- Damage around the eyes is also a danger signal for there are strains of bacteria which specifically infect the Koi here and recovery is a very precise task for the keeper.
- Noses can get rubbed during transit, usually known as 'bag injury' and once again very hard to recover for the hobbyist.

CONDITION

In general you should also look at the overall condition of the Koi:

- Does it go for its food in a ravenous manner?
- Does it swim normally with use of all its fins? Clamped fins could be an indication that the Koi is infested with parasites which as they are microscopic you would not see them.
- The dorsal fin in particular is the fin which will give you the best indication of health or similar — is it erect and not clamped down

More danger signs, a damaged and fungussed mouth (above) and an infected and damaged eye (below).

to the body?

- Look at the eyes, they should be clear and not sunken into the head; the eyes of a well-bred Koi are always slightly proud of the sides of the head. Also eyes can be greatly protruding which can be the condition of Exophthalmia or 'popeye' which can have many causes. It is sometimes a precursor of something more horrendous and such Koi are to be avoided.
- In general the shape should be good, like a plump torpedo and it should be even about an imaginary centre-line drawn down the Koi with no bulges or incursions into the smooth line of the shape.
- Watch the way in which the Koi swims; it should 'glide' through the water using all its fins for stabilisation and mainly its tail for propulsion. Beware of the Koi that swims with its fins clamped and exaggerated whole body movements to achieve motion.

COMPETITION KOI

If you are selecting a Koi for competition purposes then there is a little more to know and here you will be entering the realm of the 'tategoi'. A tategoi is a Koi (of any size or age) that has a good potential which has not yet been achieved.

Take the Showa for instance, this is a black fish which develops white and red patterns. A young Showa that displays a good 'finished' pattern of red and white will in all probability only deteriorate as it matures with the result that it would never be any good (later) for showing. Ask yourself why you only ever see a Grand Champion Koi that is a big one? Well, that is because it has only reached the potential for a Grand Champion at that age and size. It has been building up to it for years, will probably stay at its peak for a couple of years and then will be 'over the hill' and no longer fit for showing. Of course, if you wish to show a small finished Koi such as the Showa of which we speak then by all means do so, there is great competition amongst the Size One and Two Classes.

If, however, you wish to buy a Showa for growing on, then to be shown, you will need quite some expertise. Bearing in mind that this Koi is developing red and white patterns, the white will tend to be greyish and marbled, the reds will also be poor but they are only developing at this point. The trick is — how will they develop?

All of the other Koi varieties have things to look for in selection at a younger age and only years of experience will put you on the right road

slow acclimatisation when I got them home. However, if my pH was 7.0 then I would only purchase from pH 7.0 to pH 7.5 — I would not go lower as a Koi at pH 6.5 to 6.8 could be in distress already as it is outside the recommended limits for Koi. The limits are pH 7.5 to pH 8.3, or if there are mitigating circumstances from pH 7.0 to pH 8.5 as long as it is stable. At all times the stability of pH is of more importance than the actual pH reading provided that it is within the stated limits.

Larger Koi will withstand greater pH shifts than the smaller Koi, but you still need to be careful.

TEMPERATURE AT PURCHASE

After pH, the next parameter to heed is temperature and here the buying of Koi from Shows holds the greatest risk. If your Koi is displayed in a vat in a marquee then the temperature could soar very high indeed. You purchase the Koi and it may then wait in your car for a couple of hours where the temperature could climb even higher. On the way home as the car cools with the windows open, the Koi will cool but still could be 6°C above your quarantine tank when you get it home.

When you 'float' the Koi in its plastic bag for a period its temperature will drop too fast causing stress and inevitably you are inviting attack by the White Spot parasite (*Ichthyophthirius multifilis*) which is ever present in the water awaiting its opportunity.

Generally, 'floating' the Koi in its transport bag is very important as it not only allows the temperature (within limits) to equalise over a period to the new water temperature, but the bag should also be opened and small amounts of the new water introduced from time to time. This allows pH and chemical stabilisation to take place also, thus combining two precautions into one. When the Koi is eventually released into the quarantine vat, only the Koi should be transferred by lifting it out with (cold wet) hands into the new water to which it has now been gently acclimatised. Do not release the water in the transport bag into the vat water. The Koi should then be left to settle for two days without food to allow stress to subside.

PACKING FOR TRANSPORTATION

Transport in the car which has already been mentioned can also lead to 'bag injury' if the Koi is not packed or positioned properly. The Koi should be 'double bagged' (two bags — one inside the other and secured separately) in just enough water to cover the dorsal area. The remainder of the air should then be squeezed out of the bag and it should be inflated with oxygen.

The transparent plastic package should then be enclosed in a black bin-liner, this will reduce stress during transit and then put into a polystyrene fish transport box which should have its lid taped on; this will stabilise temperature during transit. This box should then be placed in the car boot in a transverse position, if it is a big Koi, so that its nose will not be rubbed due to braking and acceleration or its tail damaged in a like manner. Small Koi should not suffer this to any great extent whatever position they are transported in.

Finally, on the journey home, don't pretend that you are on the Brands Hatch circuit: remember, your new Koi purchase in the boot won't be at all impressed by this! On the other hand, it will reward you with many hours of pleasure if you have taken care of all the points that I have mentioned in the preceding text.

WORLD OF KOI

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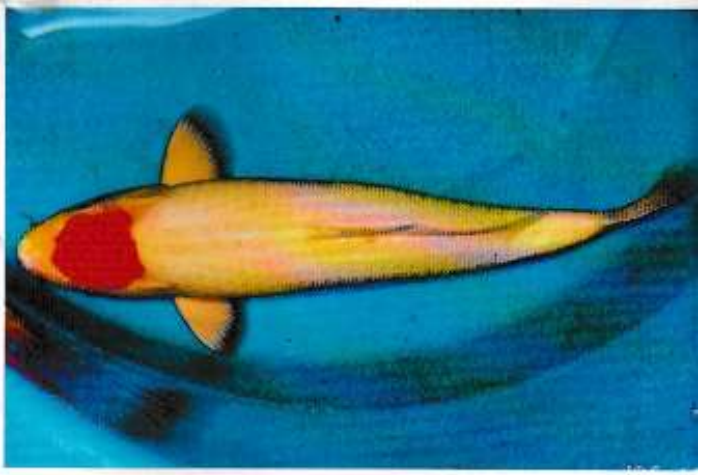
Nicky Chapple adds another dimension to the colourful Koi spectrum

PHOTOGRAPHS BY THE AUTHOR

Two-Colo

▶PHOTO 1



The most important consideration of the Koi pattern is its balance.

The most important aspect of any two-coloured Koi is pattern: there is a base colour and an overlying pattern to consider and the relationship between the two gives us our style and affects the impression on the eye. Different varieties of Koi have different styles of pattern but the most important consideration of the pattern is its balance.

SIMPLICITY AND ELEGANCE

Let's start with Kohaku. As mentioned in an earlier article, a famous anonymous quote states that hobbyists 'begin and end with Kohaku'. In my experience hobbyists tend to ignore Kohaku at first as they look too much like Goldfish, but nearly always gravitate to Kohaku with experience as they begin to appreciate their simplicity and elegance.

In Japan — the home of Koi keeping — Kohaku are the most sought after fish as they share the red and white colours of the Japanese Flag and their national Bird is the Tancho crane which is a white bird with a red head, which mirrors the Tancho Kohaku seen in Photograph 1. More importantly, the Kohaku is the be all and end all of the showing circuit — the majority of Grand Champions are Kohaku, so it is the ambition of every Japanese Koi keeper to own a prize-winning Kohaku.

The deceptively simple Kohaku is a white Koi with red Hi markings. The base colour is important as it is the background for the pattern. It should be snowy-white, almost translucent in quality, so that it enhances rather than detracts from the pattern, but it is the balance of the pattern that is most important — it should be balanced from head to tail and from side to side.

Starting with the head — a Kohaku with no red on the head is worthless. Traditionally, the norm is a U-shaped head marking (as shown in Photograph 2) but over the last ten years a more relaxed attitude has been adopted and head markings, where the Hi goes across the eyes, is perfectly acceptable.

Let's study Photograph 2 in more detail. Notice that the Hi (red) pattern is balanced from head to tail — in an ideal world it would have a small area of white at the end of the tail called an ojime (beautifully illustrated in Photograph 3) but you can't have everything! Also, just as importantly, it is balanced from side to side down the body of the Koi. Notice particularly how the white dorsal fin shows up against the Hi pattern; a minor demerit is the splash of Hi in the base of pectoral fin, however, red in the pectoral is also a good indication of the stability of the red and, if you look at prize-winning Kohaku from the All Japan Show, the majority have red in the pectorals.

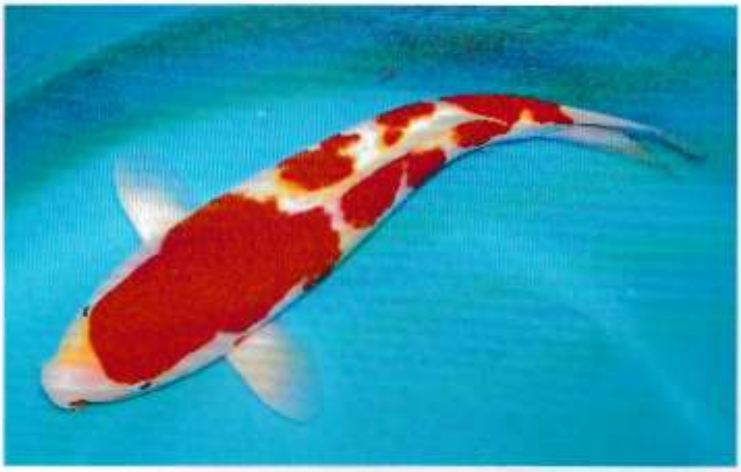
PATTERN TO AVOID

One interesting piece of information — if you are buying a baby Kohaku — you should buy one which has lots of pattern all over the body. As the fish grows, the pattern stretches and breaks — on Photograph 2, if you imagine this Koi as a baby, the pattern would have been a single Hi marking. Imagine the pattern breaks as islands moving

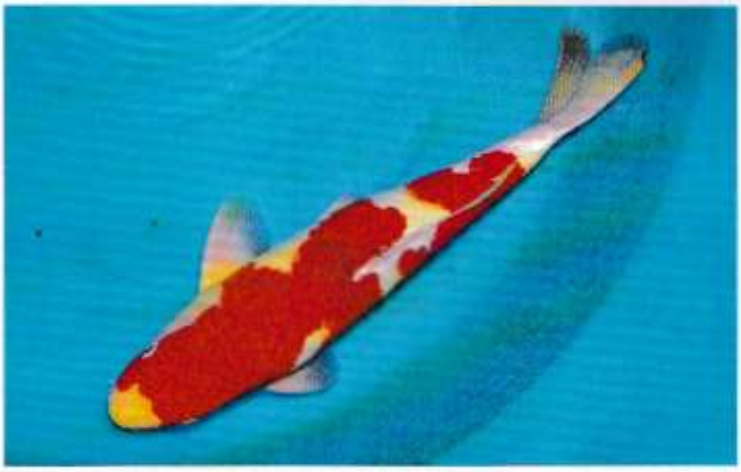
ured Koi

away from the mainland!

Photograph 4 shows the sort of pattern to avoid on a small fish. If this fish gets any larger it will be mainly white and, although the white skin is good, the pattern lacks elegance. Also notice that the pattern is only on top of the body. When buying baby Kohaku make sure that the Hi pattern wraps around the fish going below the lateral line, as you can see on Photograph 3, because as the fish grows the pattern also shrinks up.



◀ PHOTO 2



◀ PHOTO 3

BALANCE IS ESSENTIAL

Now the Utsuri group of Koi. These have a totally different style of pattern to the Kohaku. Kohaku patterns are balanced along the top of the fish whereas Utsuri patterns wrap up around the fish from belly to dorsal fin. In understanding the pattern of Utsuri it helps to know that the word Utsuri means 'reflection' (as in a mirror image) in Japanese.

The ideal Utsuri would have blocks of alternate colour, in this case black and white, from side to side and from head to tail — again balance is essential. It is not necessary for the pattern to be 50-50 as long as the overall pattern has a kind of symmetry. Utsuris are described as black Koi with coloured markings. The most common Utsuri and metallic Utsuri (a Kin Ki Utsuri and Photograph 5 a Gin Shiro Utsuri). You will notice all the examples have black in the base of the pectorals and tail. This is highly desirable, especially if the pattern is even on both sides as in Photograph 5. It is less desirable to have 'odd' fins. You will also notice that the sumi pattern normally starts from the nose to the tail; classic Utsuri head patterns include the 'V' shape and the 'lightning strike' across the head as shown in Photograph 5.

Another two-coloured Koi that is often confused with Utsuri is the

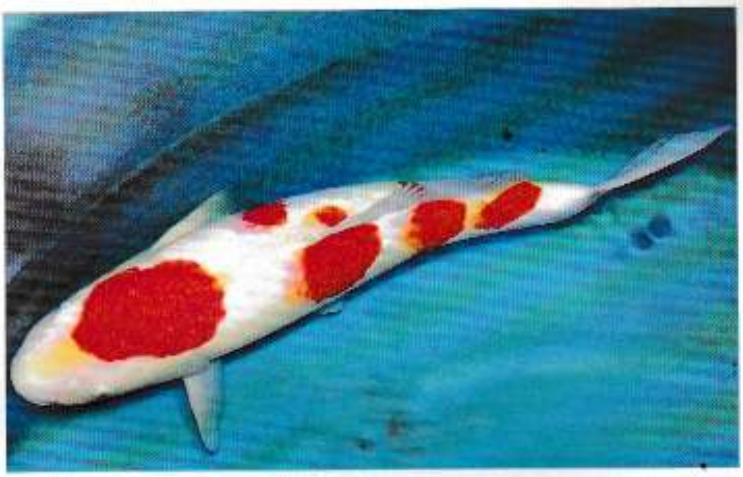


PHOTO 4

PHOTO 5

PHOTO 6

Bekko. Where Utsuri are black Koi with white markings (for example), a Bekko is a white Koi with small patchy sumi markings. As the pattern on a Bekko is minimal, the base colour is especially important: a Shiro Bekko for example needs to be very white as a creamy-coloured skin can give the whole fish a very dirty impression. Good examples of this variety are very hard to find, especially as small Koi.

FAVOURITE VARIETIES

Bekko are also available in red (Hi) and yellow (Ki) but normally in the metallic version. An easy way to tell the difference between a Bekko and an Utsuri is that Bekko normally have no sumi pattern at all on the head, where it is essential in the Utsuri and that instead of heavy sumi markings in the base of the fins they tend to hav e stripes of sumi.

Other two-coloured Koi include the Ochiba Shigure, which literally translated means 'autumn leaves on the water' which is one of my favourite varieties. These are a cross between the very friendly brown Chagoi and the blue/grey Soragoi. The pattern often resembles the Kohaku in style as the pattern tends to be along the back but this is not always the case and in this variety anything goes, as you can see in Photo-graph 6. The Ochiba has lots of pattern with colour in the pectorals, which are beautifully balanced from head to tail and from side to side — which is the better fish is then down to personal taste.

There are many other two-coloured varieties but I hope this quick look at some of the main ones has explained the essence of good pattern and balance, so that when buying Koi it gives some indication of what to look for.

David Twigg looks at equipment which will help maintain the Koi pond in good condition

PHOTOGRAPHS BY THE AUTHOR UNLESS OTHERWISE STATED

Koi Equipment

A collection of Koi equipment being sterilised in a collapsible show vat.

I had been keeping Koi in aquaria and a small garden pond for almost five years before deciding in 1985 that I wanted to specialise in the keeping of these glorious fish. That was the time when my family saw how well (and quickly!) our existing stock were outgrowing the pond that was their home — and I was finding the task of keeping water at good quality was getting harder almost by the day.

Some gadgets have not survived the test of time but others have proved their worth and have become a vital part of any new pond building project.

Coincidentally, we saw an advertisement for a Koi Show not too far from where we lived and went along to the event to help satisfy the interest we had in Koi. What we saw amazed us; several of the Show vats had Koi in excess of 24in (60cm) in them and we became immediately aware of the inadequacy of our existing pond and filter arrangement.

In those days the dealers that attended Shows tended to sell only

A handling net in use.

PHOTO: GAIL KIRTON

A total Vortex filter system.

Koi and Koi food on their stands but they were always eager to talk of the latest developments in the world of keeping water and encouraged visitors to visit their premises where the latest 'gadgets' could be seen. Some of these gadgets have not survived the test of time but others have proved their worth and have become a vital part of any new pond building project.

Maybe you the reader find yourself in the same position today as I did in 1985. Do you want to go the whole way and build a specialist Koi pond or just improve the set-up that you already have? Some of the following points may help you arrive at a satisfactory conclusion.

Koi, as we know, are bred for their colourful patterns that make such interesting viewing when idly gazing into the pond. It becomes very frustrating when the water turns green and they cannot be seen so one of the earliest 'bolt-on' gadgets that I remember being brought into the Koi world to minimise that problem was the **Ultra-violet Steriliser.** Some established ponds today do run without one of these units but it is probably only possible because of a light fish load and plants such as lilies that provide shade for the water.

Most garden pond pumps are of the submersible variety. This generally means that they are positioned in the pond and pump the water 'up' to a filter or waterfall for return to the pond by gravity. This is generally not convenient for a number of reasons. The one related to the use of UVs is that 'dirty' water is being pumped through the unit and the quartz sleeve that separates the water from the UV tube (and its electrics) can become contaminated, thus reducing the efficiency of the unit. Regular cleaning will probably be necessary.

Another 'tool' that some people find useful, with proper management, is the **Sand Filter.** Again this device requires to be fed by pump pressure and its action is designed to remove fine floating particles from the water. Large pumps are required to drive these units and they are being found less useful as more efficient filter systems are evolving.

Another of the early gadgets, also requiring pumped water, was the 'Eye-clean-pia', an **ozone producing device** that was anti-bacterial in its action thus helping to keep the water quality high. This was not, however, to catch on with Koi keepers and disappeared from the scene quite quickly.

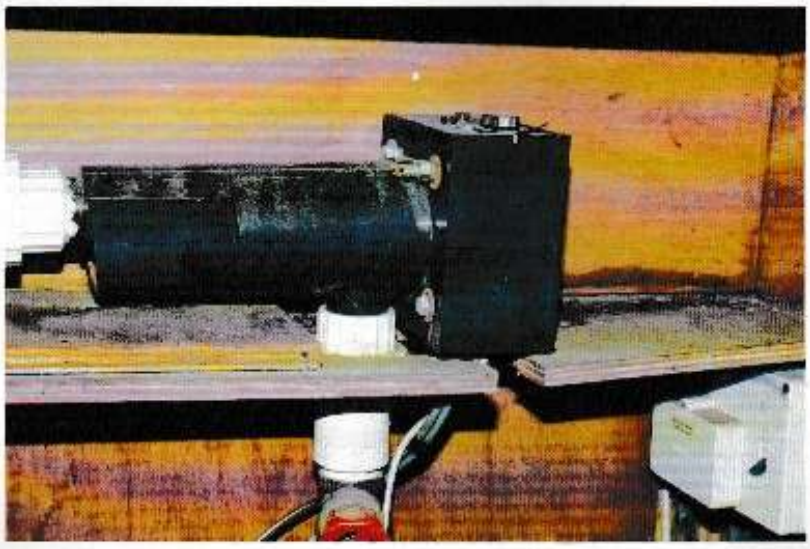
The next 'bolt-on bit' to come along, now firmly established in the Koi world, was the **'Vortex' chamber.** These units are designed to help separate solids out of the water so that the clarity of the water is improved and, more importantly, the filter has less work to do and can, therefore, work more efficiently. The drawback for adding one of these units to an existing pond system is that they should be 'gravity fed', ie, water must be pulled out of the pond via a vortex rather than be pumped to it. This prevents floating solids from being chopped

up by the pump impeller that makes settlement more difficult.

In ground, or gravity fed, filter systems are now the norm in Koi circles for, among others, the above reasons and submersible pumps have generally become relegated to a 'back-up' role rather than providing the prime water moving workhorse. Use of the external pump allowed for the next development to take place, namely **heating** the Koi pond water.

Some Koi keepers opt for the gas boiler route and others for an electric swimming pool heater (or its Koi safe equivalent) in the line of the returned water.

The sandfilter. Another useful tool in the modern Koi pond system.



An electric swimming pool heater plumbed in line with return to pond.

The warmer the water in a Koi pond the less oxygen the water can hold, but as our Koi grow, and consequently eat more, their oxygen demand on the available water is greater. The filter also has to work a lot harder to keep the water 'clean' which means that it too requires more oxygen to support its ever growing colony of bacteria. The combined effect of this oxygen demand generally means that the Koi become lethargic unless extra measures are taken to increase the available supply of this most essential of life support systems.

Early ponds were improved by fitting a **'venturi'** to the pumped return to the pond. The principle used here is that air is drawn into the return pipe from above the water line by increasing the water flow by way of a restriction in the pipe. This produces a flow of water containing a multitude of air bubbles that will diffuse into the water as they rise, or by creating turbulence at the surface if they reach that height. Once again there is a spread of efficiency among these items and, as they also tend to reduce the flow rate, Koi keepers have generally opted for an **air-stone** fed from an **air pump**. These stones, or their modern equivalent, **the diffuser**, can be placed in other parts of the system other than the pond where they can create viewing difficulties for the onlooker.

Well oxygenated clear water will support one of the Koi keepers' worst enemies; the dreaded **'Blanketweed'**. This filamentous form of algae grows very quickly to proportions that can block drains and pumps if precautions are not taken to keep it at bay. One of the methods tried over the last few years has been to pump pond water past, or through, a strong **permanent magnetic field**. Various arrangements of magnets have been tried, some more successful than others and many people found no benefit at all. Currently there are electronic versions of

this idea on the market that control more parameters of the electric field, hopefully, therefore, giving a better chance of successful control of the Blanketweed.

Assuming now that the pond is of reasonable size (and the quality of water and food fed is good) then the Koi within it will probably grow rapidly. This is where another tool is needed. The net used to catch Goldfish is generally not suitable for Koi. Large pan nets of up to approximately 75cm diameter and handles of 3 or 4m, can be required to handle the larger Koi. If handling Koi is not a regular thing then a tubular handling net (like a wind sock) will also be handy to have around when maybe transferring a fish to/from a quarantine set-up or indeed an inspection bowl.

Several companies are now specialising in the supply of mains water purifiers tailored to the type of water that your water company supplies you with. This is because although mains water is suitable for we humans it need not necessarily be so for our Koi. So this is maybe another way that a pond system can be improved without going the whole way and building a brand new pond.

I have not touched upon modern filter systems and the various media they contain, or indeed the need for a suitable quarantine set-up into which any newly purchased Koi can be placed for a while to minimise the risk of introducing bacterial or viral problems into an otherwise healthy pond. These are just some of the points to consider when 'dreaming' about improving that lovely pond in the garden.

A modern 'venturi' on display at a show recently.

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HUNDREDS OF KOI IN STOCK

Bernice Brewster says everything in the pond might not be lovely

PHOTOGRAPHS BY THE AUTHOR

Summer Time Koi

Nothing can be more tempting after a hard day at work than to relax beside the Koi pond.

Oxygen depletion mortalities

Summer is perhaps the time of year when the hobby of keeping Koi is the most rewarding. Nothing can be more tempting after a hard day at work than to relax beside the Koi pond and enjoy the company and beauty of these magnificent fish. Spending time with the Koi is probably one of the most important aspects of management, observing the way they behave, their feeding patterns and movement through the water are key features in ensuring the fish are in prime condition. At this point any feature of the normal behaviour patterns change may indicate either a problem with either the pond or even the health of the fish.

One of the commonest problems experienced in the summer months is insufficient oxygen dissolved in the pond water. The amount of oxygen which will dissolve into the water is dependent on the temperature, easily dissolving into cold water but becoming ever more insoluble as the water heats.

A typical green water problem.

Occasionally there is a sexual form of reproduction which results in the production of spores and no doubt this is how the nuisance algae manages to colonise the pond. Green water is caused by microscopic algal cells in suspension in the water and hence the reason for the common name as the water literally is coloured by the billions and billions of algae. Many Koi keepers use ultra-violet light units to control green water, so this is nuisance algae is nowhere near as widespread a problem as it has been in past years.

produce greater amounts of ammonia and this in turn encourages the bacteria and micro-organisms in the filtration system to flourish and thus increase the use of oxygen in the pond water.

It would be very easy to assume the sole function of the filter is to break down the ammoniacal waste produced by the fish but there is also a great deal of other organic waste which will increase the amount of oxygen used by the filtration system. The solid waste which is produced by the Koi is a mixture of undigested and partially-digested food bound together by mucus, which will decay, ultimately to give rise to more ammonia but as it does so will utilise oxygen dissolved in the water.

Once again, the activity of the fish dictates how much solid waste is produced and as the spring progresses into summer the Koi may well be feeding several times each day, so the burden on the filtration system increases and consequently more oxygen is used. Through the summer the filters should be flushed regularly to prevent the particulate material from settling out in the pipes and base of the filter, where it can rapidly de-oxygenate the water.

NUISANCE ALGAE

There is of course another major contributor to loss of oxygen in the Koi pond and this is the presence of nuisance algae, primarily Blanketweed or green water.

Blanketweed is formed from millions of single strand algae formed from long chains of individual cells. Each strand grows as the cells at the tip divide to give rise to new cells.

FORMIDABLE GROWTH RATE

Both blanketweed and green water thrive in the summer months, especially in the shallower ponds, where the water warms quickly and they can grow at formidable rates. Most Koi keepers prefer not to have any plants in the pond, which might detract from the beauty of the Koi but as a consequence dissolved nutrients increase in concentration and the nuisance algae thrive in this ideal environment.

If the pond system has a waterfall growing plants such as Watercress can help control nuisance algae growth, as the cress will strip the water of nutrients thus affecting the growth of the Blanketweed.

During the hours of daylight all plants produce carbohydrates using carbon dioxide and energy derived from sunlight and oxygen is produced as a waste by-product, in a process known as photo-synthesis. Oxygenating varieties of aquatic plant have earned their name because as they proceed with photosynthesis large amounts of oxygen are produced which are visible as bubbles on their leaves.

As the name would imply, photosynthesis can only take place during the hours of daylight, once it becomes dark, photosynthesis stops and the plants respire instead. Respiration means the plant life will consume oxygen

Koi feeding in a stress-free environment.

Filter system for Koi pond.

which is used to drive cellular activity and carbon dioxide is produced as a waste gas.

With respect to the nuisance algae in the pond this means that during the day time Blanketweed or green water is releasing oxygen as a by-product but at night when respiration takes place the algae is competing with the Koi in the pond and the bacteria and micro-organisms in the filtration system for available oxygen. The algae is by far the most efficient at extracting oxygen from the water, with the bacteria and micro-organisms coming second and the Koi last! Initially the algae may produce enough oxygen during the daytime to satisfy the amount they will use at night but gradually as the algae grows and the demand on the system increases, the oxygen levels are depleted over night.

These are the main areas of the pond system which will affect the amount of oxygen available for the Koi. The next point to consider is what happens to the Koi when oxygen levels in the pond drop below acceptable levels. Certainly the Koi will be able to tolerate a drop to as little as 3 mg per litre dissolved oxygen but for very short periods of time such as a matter of hours. However, this does cause the Koi some considerable stress and it will take maybe two or three weeks for them to fully recover. Dissolved oxygen levels which are persistently below 5 mg per litre affects the growth rate, tissue repair and reproduction. Once the dissolved oxygen level drops to 2 mg per litre and below the fish will begin dying.

LOW OXYGEN

It is commonly thought that if the dissolved oxygen level in the water is very low the Koi will be found at the water surface and gasping. In most instances the first sign there may be a problem with the oxygen level is the Koi become disinterested in feeding, despite the fact that the water temperature is high and should have voracious appetites. The Koi are usually extremely lethargic, lying on the bottom of the pond and apparently behaving as you might expect in the winter time, when the water is cold. Both loss of appetite and inactivity are responses to conserve oxygen, in order to digest food the Koi needs oxygen and by remaining motionless they will use less oxygen.

Because water is more dense than air Koi have to use more energy in breathing and hence they actually expend more oxygen to respire than any land living animal which breathes air. As oxygen levels in the pond water drop the fish compensates for this by increasing its breathing rate but this means the fish uses even more oxygen to push the water through the mouth and over the gills. If the oxygen levels are not improved, the Koi use more oxygen just by breathing than they are able to extract from the water. The low oxygen regime affects the pH of the blood, causing it to become more acidic, which in turn means the red pigment which binds with oxygen becomes less efficient and supply of this vital gas to the tissues is disrupted.

PLANT RESPIRATION

Once the Koi have reached this very sorry state they will rise to the water surface, where they may be seen gasping. Where there is heavy Blanketweed growth or the pond is affected by green water, the oxygen levels may plummet overnight, especially if it is sultry weather. Plant respiration by the algae overnight can strip the pond of vital oxygen and in this case it is often the largest Koi in the pond which are found dead first thing in the morning although the fish may have appeared perfectly healthy, even feeding on the preceding day. On rare occasions it may sadly be the entire Koi population in the pond which is discovered dead when such a crash in oxygen level occurs.

Persistently low oxygen regimes cause the Koi to become very stressed and one of the many consequences is the immune system becomes suppressed, so secondary parasitic and bacterial infections are very common. If these health problems are caused through low oxygen levels it is ESSENTIAL to rectify the level of this vital gas dissolved in the water. Many of the medications that are used to treat parasites or bacteria remove oxygen from the water and adding a treatment to a pond with low oxygen may well cause mortalities to ensue. In most cases, once the aeration system in the pond has been improved and there is more oxygen available, the Koi are able to recover without any addition of treatment.

OXYGEN TEST KIT

In many instances it is assumed the limiting factor on the numbers, or stocking density, of Koi any pond can hold is the size and capacity of the filtration system to oxidise ammonia to nitrite. In reality the limiting factors imposing on the numbers of Koi a pond can hold may well be dictated by the availability of oxygen in the summer months. It is important to bear in mind that Koi are only part of a complex, artificially-created biological system and other factors such as the bacteria and micro-organisms in the filter and Blanketweed growth will affect the availability of oxygen, as well as just temperature There is at least one dissolved oxygen test kit on the market, produced by Tetra, so it is possible to monitor the level of this vital gas and ensure your pond is safe for your Koi.

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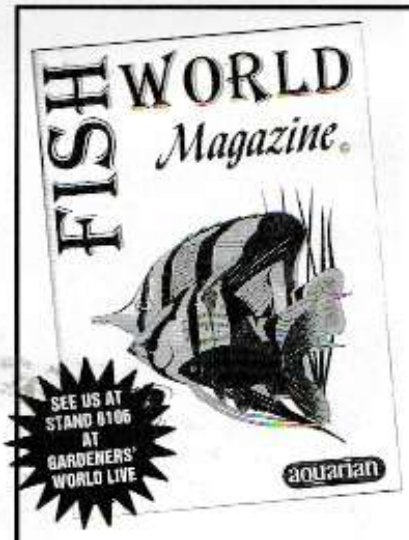

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Female *thomasi* with light belly area and a more rotund genital papillae.

dorsal fin. His body colour was a sparkling array of blue and silver. Both fish at this stage were showing their genital papillae, a sure indication that breeding was imminent.

The *thomasi* are typical open area spawning cichlids (such as *Microgeophagus ramirezi*) hence the need for flat stones or slate to serve as spawning sites. The female, true to form, laid her eggs on a stone in the centre of the tank. Both parents then protected the eggs by alternating their stay over the clutch. After three days the 200 or more opaque eggs hatched and were moved by the parents to the inside of the flowerpot. The female nursed the now wriggling brood and the male patrolled the tank on guard duty. This behaviour continued for four days, then on the seventh day the fry were free-swimming.

The fry were herded about the tank in typical cichlid fashion, a sight that never fails to fascinate, with the young fish passing as a cloud over the tank bottom.

FEEDING THE FRY

Feeding the fry was not a problem as they readily took Brine Shrimp nauplii (*Artemia salina*) and Microworm (*Anguillula aceti*) as their first foods. When the fry were three weeks old they were moved to a 91cm (36in) tank so as not to stunt their growth. At this stage crushed flake food and Grindalworms were added to their diet.

On this diet — and weekly water changes — growth rate was fast, and when the fry were about 5mm in length the brood was split again into two 91cm (36in) tanks. The total number of fish was 300, and I am sure that this is not the maximum that can be obtained from a full-grown adult pair.

I can say without doubt that if you have the opportunity to obtain these beautiful dwarf cichlids you will not be disappointed. They do make excellent community tank fish when kept with fish of similar size, so start hunting for the Butterfly from Africa.

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Send your answers (to arrive no later than 10 September 1997) on a postcard with your name and address to: Tetra Competition, Dept A/Fin Plus, PO Box 2162, Bournemouth, Dorset BH2 5ZA.

DAVID TWIGG'S KOI CALENDAR

The main holiday month is with us and this probably means that our Koi are left in the hands of friends or relatives for a couple of weeks. It is probably as well to do all the maintenance tasks a little more diligently than normal to minimise the risk of problems whilst you are away. If you own one of those ponds that grow copious amounts of blanket weed then your fish should manage quite well for a couple of weeks without food. It could be wise, however, to enlist the help of a neighbour or other Koi keeping friend to keep an eye on things during this time. Bottom drains that feed filters can block up and pumps can fail, so it's worth paying particular attention to the maintenance of these before you go.

If you do not engage someone to feed your pets whilst you are enjoying the sun, remember to keep an eye on the water tests when you recommence feeding as there will have been a degree of die back in the filter during your absence that may take a little while to recover. If you are not on holiday at the time and you decide to visit KOI '97 at Billing then I look forward to meeting you there!

A trip across country to visit relatives in the lovely Suffolk town of Saxmundham was followed up by calling in at the Royal Norfolk Showground on the way home where the Norwich Section BKKS held their first Open Show over the weekend of May 10/11. This Show, held in a large building within the Showground, meant that visitors could stroll around the dealers and competition vats in comfort.

Over 2,000 people attended the show that included a range of lectures by Paula Reynolds, Barry Goodwin, Gary Pritchard, Kate McGill and the Japanese breeder Shunsaki Yoshida. Thirty six hobbyists entered 174 Koi and the judges awarded the following major prizes: John Knight & Marilyn Cooke — Grand Champion & Mature Champion (Size 6 Sanke); Geoff Wilson — Adult Champion (Size 4 Kohaku); Doug Raby — Baby Champion (Size 2 Utsurimono); Roy Collins — Doitzu Champion (Size 4 shusui); Luke Roberts (Junior Member) — Unique Koi (Size 1 Beni Kumonryu); Tewin Mil — Best Dealer (Showa).

Marilyn Cooke and John Knight with Mr Yoshida and their collection of trophies won at the Norwich Section BKKS Show.

The Grounds of Donnington Grove Country Club House, the magnificent setting of this year's Kennet Valley Section Show.

PHOTOS: DAVID TWIGG

The Northants Section BKKS Annual Closed Show was held at the Saints Sports and Social Club, Northampton where, after a slight hiccup over the water supply, the Show went on and the following members were successful in the three size event.

Barry Bird — Grand Champion, 1st size 2 Showa; Pete Taylor — Best in Size 1, 1st size 1 Kohaku, Koromo, 1st size 2 Hikari-Utsuri; Peter Robinson — Best in Size 2, 1st size 1 Sanke, Showa, Utsuri mono, Bekko, Kin Gin Rin, Hikari-Utsuri, Hikari-muji,

1st size 2 Sanke, Tancho, 1st size 3 Kawarimono, Ken Chapman — Best in Size 3, 1st size 3 Kohaku, Showa, Utsuri mono, Hikarimoyo, Nigel Sismey — 1st size 1 Asagi-Shusui, Hikarimoyo, Bryan Moore — 1st size 1 Tancho, 1st size 2 Hikari moyo, 1st size 3 Hikarimuji, Trevor Halford — 1st size 1 Kawarimono, 1st size 2 Utsuri-mono, John Perkins — 1st size 2 Kohaku, Bekko, Jenny Nesbitt — 1st size 2 Koromo, Kin-Gin-Rin, Hikarimuji, Judges' special prize for exceptional Goshiki, Sylvia Day — 1st size 2 Kawarimono, 1st size 3 Koromo, Kin-Gin-Rin, Best Lady: John Byles — 1st size 3 Sanke, Unique Koi, Mike Binns — 1st size 3 Asagi/Shusui.

The Kennet Valley Section BKKS Show was held this year in the magnificent surroundings of the Donnington Grove Country Club near Newbury. The show was set up within a walled part of the gardens and covered by awnings for the whole length. Just outside this sheltered area were gardens that contained large natural ponds containing Koi. The Japanese temple and large rocks that were an integral part of this peaceful layout together with the several cherry trees made for a wonderful setting for visitors to behold.

Judges Paul Jarret and Nigel Williams, assisted by Wayne Eady and Bill Ennis, viewed 151 fish in 21 vats and came up with the following major results: Martin Priday — Grand Champion (Size 5 Sanke), Mark Debourne — Supreme Mature & 1st in Size Five (Kohaku), Peter Webber — Supreme Adult & 1st in Size 4 (Kohaku), C. R. Bruce — Supreme Baby & 1st in Size 1 (Kohaku), 1st in Size 2 (Sanke), John Giddens — 1st in Size 3 (Sanke), David Williamson — Kennet Valley members Best Overall Vat.

A small confession here, just in case Show Organisers and readers think I am some sort of Superman able to cover many Shows in a short space of time — the following details are by courtesy of our Editor who lives much closer to the event concerned than I do!

The Middlesex and Surrey Borders Section of the BKKS Show had a slight change of venue this year due to refurbishment taking place of the Grandstand at Kempton Park Racecourse. The event was held under canvas in a large marquee in the centre of the Racecourse right under the flight path from Heathrow and some local model radio-controlled aircraft. Fortunately the previous few days' rain had abated otherwise the site might have been renamed Koi island! The Show vats were laid out in the centre of the marquee surrounded with all the paraphernalia of Traders, Suppliers and Support groups (BKKS and Hounslow Aquarists Society information stand included).

The major winners were: Grand Champion: J Peterson, Kohaku Size 5; Supreme Mature: Dennis Brown Sanke Size 5; Supreme Adult: Dennis Brown Kohaku Size 4; Supreme Baby: Alan & Pat Peppercorn Ginrin Size 2; Best Jumbo: Les Tauleur Kawarimono Size 6; First Junior: Chris Vee, Claudette Haines Hikarimuji Size 3; First Novice: R Carter Koromo Size 5.

Size Awards

Les Tauleur — 1st Kawarimono Size 6, 2nd Utsurimono Size 1, 2nd Tancho Size 3; Mick Whitney 1st Kohaku Size 1, 2nd Sanke Size 4; Dennis Brown 3rd Utsurimono Size 1, 1st Kohaku Size 4, 1st Sanke Size 5; Mario & Paule Cavouzi 3rd Kohaku Size 3, 3rd Ginrin Size 4; Alan & Pat Peppercorn 1st Ginrin Size 2; Alan Harrington 2nd Kohaku Size 2; Brian Robertshaw 3rd Sanke Size 2; Peter Saul 1st Ginrin Size 3; R. Carter 2nd Koromo Size 5; Peter Turner 3rd Sanke Size 5.

Shows in August

Two Shows notified to me this month although there are others around the country. The main event of the Koi calendar is the BKKS National show at Billing Aquadrome. This has now become an international event with visitors arriving from all over the world. The large site with its covered dealer and exhibition areas, the craft and lecture tents and extended catering facilities all go towards making this show a winner for Koi keepers everywhere.

KOI MEETINGS IN AUGUST

3 Nottingham & District Section BKKS. Visit to Peterborough & Cambridge Section ponds. Contact Shirley Hind on 0115 981 0923.

3 Avon Section BKKS. Birmingham & West Midlands Section members visit Avon ponds. Contact Sandra Lane, on 0117 9491061.

6 Leicestershire Section BKKS. Mrs Potter of Maple Aquatics is the Speaker at Kirby Muxloe Sports Club. Contact Ray Dunkley, 0116 2771600.

9/10 BKKS National Show Koi '97. Open Show at Billing Aquadrome, Northampton. Contact Lou Jackson on 01322 463669.

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

12 Nottingham & District Section BKKS. Vet Chris Marshall speaks on Fish Bacteria. Meet at the Western Club, Hillside, Nottingham. Contact Shirley Hind on 0115 981 0923.

14 Merseyside Section BKKS. Monthly meeting at Broadway Country Club, Norris Green. Contact Phil Adamson on 0151 287 9911.

16 Leicestershire Section BKKS. Evening pond visit. Contact Ray Dunkley, 0116 2771600.

17 Heart Of England Koi Society. Visit to Crouch Valley BKKS ponds. Contact me on 01926 495213.

30 Leicestershire Section BKKS. Evening pond visit. Contact Ray Dunkley, 0116 2771600.

30/31 Ireland Section BKKS. English Style Open Show at Hillsborough Nursery Centre, Glenabrie, Belfast.

30/31 North Herts Section BKKS. Closed Show. Fishworld '97 Show Queensway Hall, Dunstable, Beds. Contact Ray Kilham, 01582 391988 or Ritchie 01763 245398.

31 Avon Section BKKS. Visit East End Section ponds. Contact Sandra Lane, on 0117 9491061.

31 Merseyside Section BKKS. Coach trip to Yorkshire Section BKKS. Contact Phil Adamson on 0151 287 9911.

KOI SHOWS IN 1997

SEPTEMBER

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

7 Leicestershire Section BKKS. Closed show at Farnsworld, Gartree Road, Leicester. Contact Ray Dunkley, 0116 2771600.

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

13/14 Mid-Somerset Section BKKS. Closed show. Part of the Countryside Cavalcade, Metalp Hall 2, The Royal Bath & West Showground, Shepton Mallet.

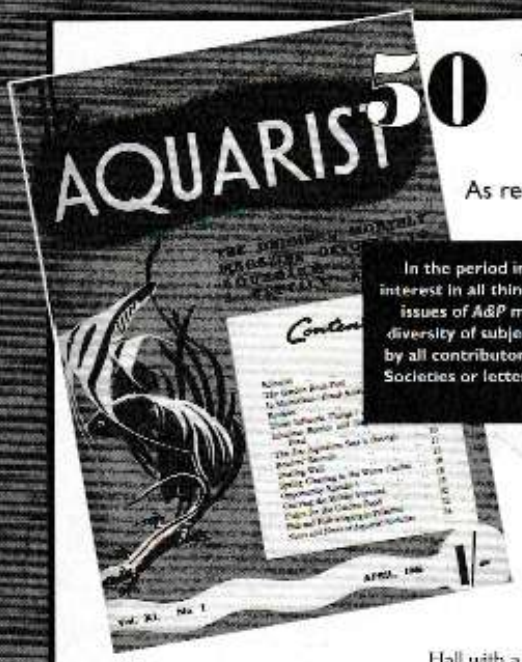
OCTOBER

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

All Koi keepers are welcomed to the events mentioned in this Calendar (an entry fee may be payable) and further details can be obtained from the contact telephone number quoted alongside the diary entry. My thanks go to all Koi Club Secretaries or PROs' and others who send me their latest calendar for inclusion in this column. If your club is not mentioned and you would like it to be, please write to me via the Editor at MJ Publications Ltd, Coxlea House, Wallisley 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.

50 Years Ago ...

As recounted by Editor **Dick Mills**



In the period immediately after the war the increase of interest in all things aquatic was rapid. Looking through past issues of *A&P* makes interesting reading not only for the diversity of subjects raised but for the apparent enthusiasm by all contributors whether they be authors, reporters from Societies or letters from readers. August 1947 threw up this selection of topics ...

Two letters to 'The Aquarist' complained about a previous article in which the contributor had encouraged the destruction of some English native moths because they afflicted the water garden. As these moths were rather rare you can imagine the tone of the letters, although the contributor gave good account of his views in a reply in a subsequent issue.

An article with a difference was 'Fishes in Heraldry' by George F. Hervey. Barbel, Crucian Carp and Pike were amongst species that might well have been assumed to have appeared in family crests and the like but even Haddock and Herring were featured!

Public exhibitions were incorporating aquatic subject matters and those included the *News of the World* Home Making Exhibition at the Royal Horticultural Society's Old Hall with a display presented by Fish Tanks Ltd. Watford Aquatic Society staged an exhibition of pond and aquarium fish at the Horticultural Show at Victoria Schools, Watford. East London and Benhurst Societies sponsored a display of aquaria at the 'Three Towns Show' held at Cotton's Recreation Ground, Romford. South London Aquarists Society staged a show in connection with the Wimbledon Produce Show. The Enterprise, Enfield, and Potters Bar Aquarists Societies combined to stage a Show at Friary Park, Friern Barnet.

At the Bristol Aquatic Society, visiting Speaker Dr Clark defended his practice of feeding his Shubunkins solely on Daphnia. Apparently Club members begged to differ on the resulting body shapes of fish fed on such a limited diet.

The Cornish Aquarists and Pondkeepers Association held its first exhibition at the Drill Hall, Falmouth, in conjunction with the Cage Bird Society. Among the exhibits was a fine marine aquarium set up by Mr Gerald Cook which featured Pipefish, Butterfish, two kinds of Wrasse, a Sea Stickleback, a Father Lasher, red and grey Anemones and plants like bright green lettuce. All these had been collected from local rockpools. Mr Cook also showed Silas, a Giant Salamander — this 2ft long specimen had his photograph taken many times.

Through the Guppy Breeders Society, the 3rd Edition of the Guppy Breeders Year Book made its appearance.

Halifax and District A.S. held its first Show in conjunction with the Halifax Ornithological Society. There were two Classes, Cold-water and Tropical; both were for the best set up tank in each Class with the usual 1st, 2nd and 3rd and a certificate of merit for the best set up tank in the Show irrespective of Class.

The Scottish Aquarium Society came up with a novel way of ensuring all their members 'read' the latest Innes 'Exotic Aquarium Fishes' — they projected its pages on a screen with an Epidiascope! A recommendation 'that a loan of about 150.00 be raised from members, each lending what he or she thinks fit, for the purchase of tanks and equipment for Shows' was approved.

A member of the previously-mentioned Scottish Aquarium Society, Mr Strahan Kerr, made his way across the sea to the first public meeting and exhibition of the Ulster Aquarium Society where he gave an address on 'This fascinating hobby'.

FROGS & Friends

By BOB and VAL DAVIES

See FROG OFFER on Page 83

HERP FACT FILE

BEARDED DRAGONS — THE IDEAL LIZARD?

Bearded Dragons — a keeper-friendly Lizard which may live eight to10 years.
PHOTO: BOB & VAL DAVIES

Inland Bearded Dragons (*Pogonia vitticeps*) are extremely popular and widely available at the moment. Although they may have been bred in the UK earlier the first account we read of captive-breeding was presented at the 1988 UK Herpetological Symposium. Since then they have been successfully bred by many keepers and are now bred on a commercial scale in the UK and the USA. *P. vitticeps* is one of some 30 species of the genus which belongs to the Family Agamidae.

Since they are natives of Australia most of the species are not available because of an export ban.

The common name comes from the spiny, expandable throat-pouch which is inflated during aggression or courtship — mature males develop black colouration on the pouch.

The 'fearsome' spiny appearance of these lizards belies their gentle nature. If obtained as babies they can become 'silly-tame' and make excellent vivarium subjects. The spines are relatively soft and flexible although the dorsal surface is covered in small spines that give the impression of a wire brush if stroked from the tail end towards the head. Colouration is variable — sandy brown or greyish with darker markings and often brown to orange/red on the face. In the wild a number of colour morphs are found in different areas. Breeders in the USA are currently producing several of these morphs one or two of which are just becoming available here, although these will command higher prices.

Feeding is not difficult: Beardies tend to be omnivorous — the diet should consist of Crickets, Locusts, an occasional thawed pink mouse plus a large variety of plant material such as Watercress, Chinese Leaves, Endive, sprouted pulses/seeds, Dandelion and Nasturtium leaves and flowers, grated Apple and Carrot, Sweetcorn, skinned Broad Beans, etc. They need to be started with plant material as babies, older specimens may not adapt to foods which have not been previously offered.

Providing a wide variety supplies different vitamins and minerals. Food should also be dusted with reptile vitamin/ calcium supplements three or four times a week. Small chunks of Cuttlefish bone will also be taken from a lid. A small water bowl should be supplied although it may be used infrequently. On a suitable diet growth is quick, maturity being achieved in 12 months. Total length of adults is 22-23in (56 58cm).

To avoid aggression, keep one male to one or more females. Groups of Beardies in very spacious quarters form a hierarchy with dominant and subordinate animals and tend to live together peacefully each specimen having its position in the social structure, something not possible in a small vivarium.

VIVARIUM CONDITIONS:

Vivarium size: Minimum 60x24x18in (150x60x45cm) for an adult pair.

Substrate: Coarse, non-dusty sand.

Furnishing: Rocks for basking, two cork bark shelters (one at the cool end).

Lighting and Heating: Spot-lamp for basking, full-spectrum (UVB) fluorescent tube.

Temperature range: Day — Cool end; 82-84°F (28-29°C); Hot spot; 104-110°F (40-43°C). Night — 70-75°F (21-24°C). Photo-period 14 hours.

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OUTDOORS

The thick, green 'soup' which developed in our frog pond (Frogs and Friends, *A&P*, July 1997) was miraculously cleared by a sudden bloom of Daphnia, so many that the water had a reddish hue.

It also provided ideal conditions for hundreds of Bloodworms and even Gnat larvae. Although, regretfully, a substantial number of Frog tadpoles were lost the increased population of these other creatures proved to be a bonanza — they were netted to use as food for Alpine Newt tadpoles. The Bloodworms were clustered on the pond liner in mud tunnels and scraped off easily with a small aquarium net. Substantial numbers of *Daphnia* were used to seed various containers with a view to harvesting them over the summer.

HOLIDAY 'SOUVENIRS'

With the holiday season in full swing it seems appropriate to warn readers who might be

visiting North Africa about the trade in holiday 'souvenirs' made from animals. Last year we mentioned the grisly trade in Tortoises and various objects made from their shells. A similar trade exists in Tunisia where, as in Morocco, Tortoises are supposedly protected by law but the law is seldom enforced. Live Tortoises and other reptiles are often on sale also. Apart from humane considerations it is illegal to bring home animals or their derivatives (shells, skins, etc) which are listed on CITES (Convention on the International Trade in Endangered Species). In addition, European Community regulations on imports were tightened up as from June 1, 1997. A free Fact Sheet is available from: Department of the Environment, Freepost (BS 9156), Houlton Street, Bristol BS2 YBR. State your age group: under 16, 17-30, 31-50, 51 plus.

IMPORTANT DIARY DATE

NINTH ANNUAL IHS FAIR & INTERNATIONAL SYMPOSIUM, September 13/14, 1997

Due to the popularity of previous annual Reptile Fairs this year's will be a two-day event with the added attraction of an International Symposium on the Saturday evening. As usual, the venue is the Alumwell Community Sports Centre, Walsall (12 miles from Junction 10 on the M6).

Open 10.30am to 4.00pm both days. Entrance to the Fair £2.00 adults, 50p children (members and non-members). Speakers at the Symposium include: Sandra Barnett from the National Aquarium in Baltimore — Arboreal Iguanids and Dendrobatids; Bob Clarke (USA) — breeder of rare Boid snakes.; Bernd Eidenmuller, Germany — breeder of Monitor Lizards; Richard Gibson, Jersey Zoo — breeding of the world's rarest snake; Paul Rowley, Liverpool School of Tropical Medicine — Venomous Snakes.

Entrance to the Symposium is £5 for members and must be pre-booked.

For details of IHS membership and the Show write to: Membership Secretary, 15 Barnett Lane, Wordsley, West Midlands DY8 5PZ.

ILLEGAL TRADE AND SMUGGLING

Common Chameleon from Morocco; completely harmless but feared in its native country. PHOTO: BOB & VAL DAVIES

Anyone over the age of 18 can join the fight against the illegal trade in wildlife. Around 25 per cent of the 20 billion dollars animal trade in wild animals and plants is illegal. The WWF are running an 'Eyes and Ears' scheme through which people can help to combat illegal trading. For details phone 01483 426111 or write to 'Eyes and Ears', Panda House, Weyside Park, Godalming, Surrey GU7 1XR.

The Tortoise Trust has warned that Tunisia is one of the main sources of smuggled Tortoises which are then sold in Britain as 'captive-bred' Spur-thighed Tortoises (*Testudo graeca*). The Tunisian species aestivates during summer and cannot be hibernated in this country which means that many will die. The Trust requests that anyone suspecting an infringement of the regulation should contact their local Police Wildlife Liaison Officer.

The Tortoise Trust exists for the welfare of Tortoises (and Turtles) as well as promoting captive breeding. It is currently running conservation schemes in North Africa. Members can obtain advice on Chelonian species. A number of books, videos etc. are available from: BM Tortoise Trust, London WC1N 3XX.

The Mediterranean Chameleon (*Chamaeleo chameleon*) is often on sale in North African markets, sometimes alive but often dried for use in traditional medicine. Although listed on CITES Appendix II (imports need export and import licences) it is also listed in the European Community Annex A which, as far as Europe is concerned, puts it on a par with CITES App. I, ie. no import allowed unless by Zoos, scientific or educational establishments, etc. and even then under strict licence controls. In most countries where Chameleon species are found they are often regarded with superstition. Thought to be spirits of the dead or evil spirits (and often said, as with many other reptiles, to have a venomous bite in spite of the fact that they are completely harmless) they are frequently killed on sight because of this belief. In North Africa they are believed to possess magical powers hence their use in medicine — their meat is considered to be a cure for unfaithful husbands and may be mixed in with their food by worried wives.

A FIRST UK BREEDING OF TYLOTRITON

Emperor Newt larvae. Two hours after taking this photograph it left the water. PHOTO: BOB & VAL DAVIES

Way back in May 1995 we wrote about the apparent difficulty in breeding Emperor Newts (*Tylotriton verrucosus*). Originally believed to come from Vietnam, huge numbers were entering the USA during the Vietnam war which suggested a wider distribution. It is now said to be widely distributed in W. China, Burma, Thailand, Nepal and India. It was thought to be a cool, montane forest creature but successful breeding in Britain has been achieved two years running during quite hot weather.

Mating occurred in shallow water (3in/8cm). Courtship was similar to that of *Triturus* species — tail-waving by the male but the eggs have been stuck to leaves of Indian Fern Plant several inches above the water. The egg-laden leaves were removed to small containers with an inch (2.5cm) water. Larvae spend the day hiding and feed only at night.

Nishikigoi — Still Waters

Author: **Nigel M. W. Caddock**

Publisher: **Nishikigoi International**

Price: **£35** plus £5 p&p (UK only — overseas call for details)

Nishikigoi — Still Waters is an incredible new lavish hardback book crammed full of the most breathtaking Koi photographs ever seen. A picture really does speak a thousand words ... *Still Waters* tells its own story using spectacular photographs.

For 15 years Nigel Caddock, publisher of Nishikigoi International magazine, has been compiling a unique collection of beautiful Koi images and they are now available together in a lavish, superbly presented hardback book with 320 pages of unique material to enduring testament to the beauty of Nishikigoi. *Still Waters* had its formal UK launch at the Kennet Valley Show at Donnington Grove on June 21/22.

The book is designed to be Nishikigoi Journey of discovery made up of three component elements. The first contains 100 pages of fantastic Koi pond photos — the images are not just beautiful photos but will also inspire lots of great ideas for you to apply in your dream pond.

The second element offers beautifully presented photos of some of the best Koi ever seen in a totally original, highly innovative context. Not only are there examples of some of the best Koi anywhere but also unusual varieties of Koi. This element of *Still Waters* also contains fascinating variety observations and will answer some real Koi variety questions in an entertaining and highly informative presentation.

The final element in this unique journey is composed of images of Japan and uniquely captures the masters of Koi and their mystical environment. Much of this material is totally unique and has never been seen before.

Nishikigoi — Still Waters is available from Nishikigoi International Ltd. There is also a very Special Presentation Numbered Limited Edition Volume available at £75 plus £10 S&H (UK Only).

These are stunning hand-made bound volumes are each individually numbered and signed. There are only 500 of these on the planet and more than half were sold out before the book was even launched so if you want a piece of Koi history order now or it will be gone forever!

Still Waters is designed to be a Koi photo book but it also contains around 15,000 words so there really is something for everyone and if you like Koi you will love this book. To order a copy or get more information contact: Nishikigoi International, Hilton House, Roseclair Avenue, Lowton, Warrington, Cheshire WA3 2DW. Tel: 01942 720664. Fax: 01942 720914.

DICK MILLS

Now Win This Fabulous Koi Book!

Recently published the extraordinary produced Nishikigoi — Still Waters by Nigel Caddock has been receiving rave reviews from those fortunate enough to have seen a copy. Now YOU can win a copy of your own for we have two to give away to the winners of this simple competition.

All you have to do is send your answers to the two questions and complete the Tie-Breaker below and hope you'll be picked out of the hat either first or second!

Question 1: What Koi variety is shown on the front cover of the Book?

Question 2: What region of Japan is most closely associated with Koi?

Tie-Breaker (answer in no more than 20 words)

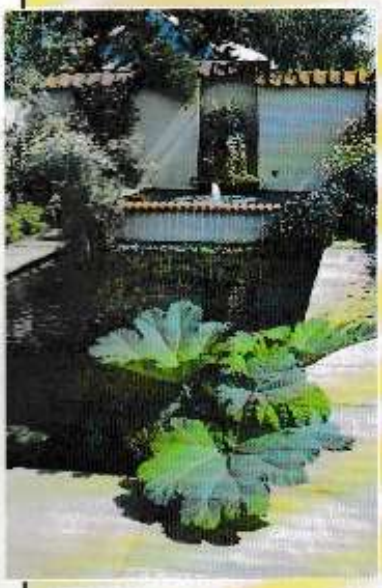
I ALWAYS LOOK OUT FOR AQUARIST & PONDKEEPER MAGAZINE BECAUSE

Send in your answers on a postcard or sealed-down envelope to:
KOI BOOK COMPETITION, A&P, MJ PUBLICATIONS LTD, CAXTON HOUSE, WELLESLEY ROAD, ASHFORD, KENT TN24 8LT.
Entries must be received by 19 September 1997

A to Z of plants

GUNNERA; 'GIANT PRICKLY RHUBARB'

We offer no apologies for the invented common name, as this is the only description that springs to mind once this magnificent plant has been encountered. The plant belongs to the Haloragaceae but may be included by some in its own group the Gunneraceae.



By **DICK MILLS**

PHOTOGRAPH BY THE AUTHOR

GUNNERA MANICATA

Description: Here is a plant which, when mature may have a horizontal spread to match its vertical height. The large, bristly mid-green leaves, often 5ft across or more, have wavy or indented edges and are held high on very prickly stems. The plant may reach a height of 10ft or more. The green brown flower spikes are equally proportioned, 3-4ft, looking like pipe cleaners.

Distribution: Brazil, South America.

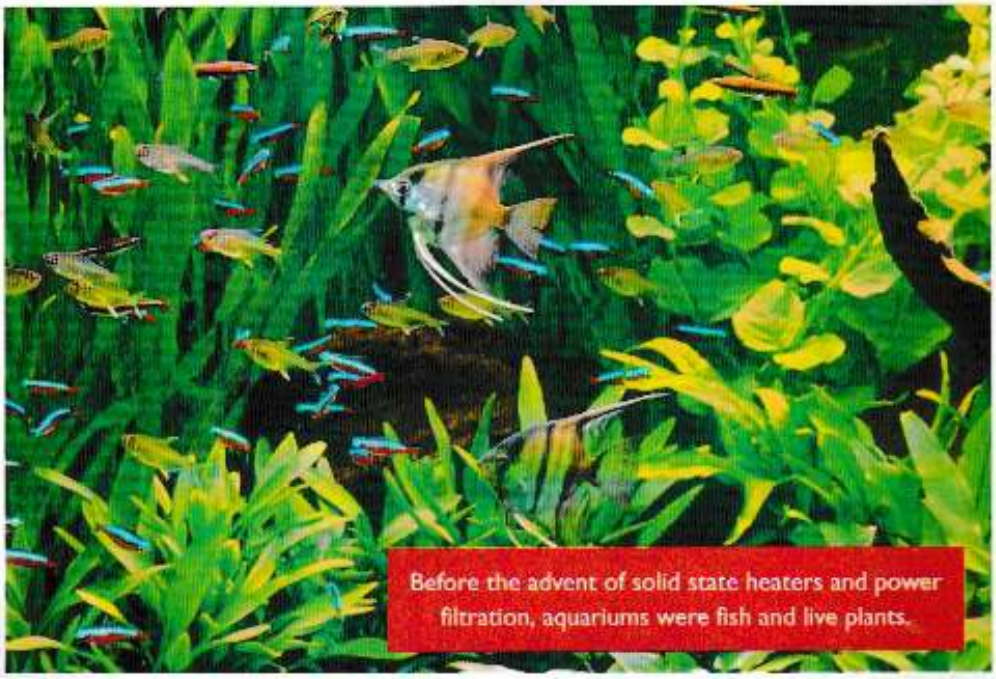
Cultivation and Propagation: As can be imagined, this plant needs two essential things for growth — space and moisture. As such, a bankside location suits it well although it should be planted a little way back from the water edge so that its large foliage spread does not shade the pond. Obviously, the choice of this plant should be limited to those having sufficiently large ponds so that the plant does not overpower the design. The leaves die back in winter and whilst the plant may be frost-hardy the best plan is to protect the crown during the period of cold weather. With mature plants this is a simple matter of folding down all the dying leaves over the crown but for young plants these covering leaves may need extra protection with straw or other similar frost-deterring coverings. Should you feel the need to propagate this plant (assuming you have the room for more!) then this is achieved by dividing the clump as required.

Other Species: Other South American species (from Chile and Patagonia) are the smaller growing *G. chilensis* (also known as *G. scabra* and *G. tinctoria*) and, from the Falkland Islands, *G. magellanica* which is a ground-covering species suitable for cooler temperatures.

Dr Ted Colleti looks at the appeal of the biotope aquarium and how to set it up

PHOTOGRAPHS BY MP. & C. PIEDNOIR

Welcome Back, Thoreau



Amazonian Aquarium.

Before the advent of solid state heaters and power filtration, aquariums were fish and live plants.

A few years back I wrote a series of magazine articles espousing my idea of the geographic aquarium. This was an aquarium designed for fish and plants from the same global regions, taking into account such factors as water conditions and aquascapes. There were few if any reference sources on the subject at the time I undertook that research project.

But I was not alone in my interest. At about this same time, a 'green trend' as I call it was hitting our hobby. Books and articles emerged espousing the virtues of the natural

aquarium (an oxymoron when you think about it). Live plants became more popular than ever. Societies have even established show classes for tanks set up in the biotopic style.

A LITTLE HISTORY

Before the advent of solid state heaters and power filtration, aquariums were fish and live plants. It was deemed essential to have both organisms co-existing for a successful aquarium. In the 1960's, with the words 'ecology' and 'naturalist' becoming more prominent in American culture many aquarists of the day espoused the idea that the ideal healthy aquarium should contain fish and plants from the same geographic region. Wilfred Weigel (whose Aquarium Decorating and Planning is still a useful classic) and Rataj and Zukal were some of the more vocal proponents of the biotopic style of aquarium management.

But keeping flowering plants were difficult for most aquarists of the day. None of us fully understood the chemistry involved in biological filtration or the science of lighting and fertilisation.

Furthermore, the growth of Florida fish farms and South American importers increased the number and affordability of available fish. Coupled with advances in filtration, decor, and plastic plants, biotopic aquariums were set aside by the majority of hobbyists who favoured the easier and more 'colourful' community tanks. In places like Germany, however, companies like Tetra successfully promoted the idea of the natural aquarium with related accessories.

Enter the 1980's. A renewed interest in the environment and organic methods created a biotope enlightenment' in the hobby. CO_2 diffusion systems and new lighting and fertilisers made exotic planted aquariums more feasible. The steady interest in the African Lake Valley fishes (and the growing interest in South American Dwarf Cichlids) spurred hobbyist curiosity about the natural biotopes of their fish. At the same time the marine hobby exploded, and a new breed of aquarists attempted to 'replicate the reef'. Related articles and books appeared. The natural aquarium had returned.

PHLOSOPHY AND THEORY OF NATURAL AQUARIUMS

The goal of the natural aquarium is to use as many natural aquatic materials as possible (live plants, driftwood, natural gravel, etc). Ornaments are generally avoided. For the purposes of this column three types of natural aquariums will be emphasised:

Landscape Aquariums — These tanks try to replicate natural aquascapes. River beds, bogs/marshes, or coastal reefs are examples. Fish and plants are chosen which have adapted to these landscapes.

Geographic Aquariums — These are aquariums with a global perspective. The most popular (and easiest) geographic aquariums use Southeast Asia and South America as a guide when selecting fish and plants.

Biotope Aquariums — These tanks try to replicate a very specific regional habitat. An example of a biotope aquarium would be a Rio Negro blackwater marsh with Rummy-nose Tetras, *Corydoras adolfi* and Hairgrass. In this sense they combine the best from the landscape and geographic aquarium philosophies.

But biotope aquariums are much more than just 'geographic landscapes'. From water chemistry, to aquascape, to temperature, lighting, and natural forms of fish and plants, the goal of the biotope aquarium is replication. What we're talking about here are not ways to keep fishes, but ways to ways to keep aquariums. No one element is emphasised.

THE BENEFITS

The benefits of maintaining one of these natural aquariums are several: the challenge of replicating nature; the oppor-tunity to witness natural camouflage; enhancing one's understanding of evolution; and appreciating the natural beauty of aquatic geographies. Next to a hobbyist's first spawning (of their fish, that is) few things in our hobby can match a natural-looking aquarium.

If you have a question about creating a biotopic environment for your fish, using live plants, aquascaping, or wild-type fish please send your questions to me c/o this magazine or at coletti@bbdo.com

African River Aquarium.

SHORE WATCH

BY ANDY HORTON

In the column for the year I will examine some aspects of the biology and behaviour of the rock pool fish and marine invertebrates that are both interesting and useful knowledge for aquarists.

Seas around the British Isles reach their highest during the month of August. The surface sea temperature offshore is unlikely to reach the magic 'toe test' temperature of 20°C. However, on sandy, shallow beaches and in estuaries, temperatures at low tide have been measured in hot summers up to 22°C. Rock pools high up on the shore could even heat up to 26°C, but they will be devoid of fish and crabs and the motile forms of shore life.

The average sea surface temperature in the English Channel during August is only 17°C. In the northern North Sea the sea will only reach 14°C. These temperatures are important to the aquarist/rockpooler because of the narrow range of sea temperatures in which fish and other marine life can live. For half the animals kept in home aquaria, a cooler is necessary to keep the water temperature down to 21°C and below.

School is out for summer, so there will be plenty of kids kicking their heels by the middle of August. A visit to the rocky coast with the family can provide a welcome change.

Regular readers of this column will know just how important it is to consult the Tide Tables and arrive down at the shore when the tide is out. However, this is just the elementary step. Whereas, just mucking about the pools will keep the youngest happy, a few extra props will make a long trip to the coast much more worthwhile.

DANGERS ON THE SHORE

Parents have two problems. Firstly, the dangers on the shore should be recognised. Without scaring the youngsters you have to watch out for the incoming tide on some shores which can rush in and cut off children engrossed in examining the fascinating creatures under rocks and in the pools.

I have always been impressed by the ability of primary school children, with their low centre of balance, to scramble over slippery seaweed covered rocks, to avoid the sharp barnacle-encrusted boulders, whilst the adults slither around and generally put their foot in muddy pools.

However, young children should always be watched: the consequences of a fall can be serious.

Small prawns are abundant in the pools in the south during August. This small species is Palaemon elegans. Prawns are sometimes known as 'buntings'.
PHOTO: ANDY HORTON

INFORMATION FOR CHILDREN

The second problem is how to answer all the queries that this mysterious world is likely to pose.

Children have the ability to ask all those pertinent questions that are awkward to put into words that are understandable.

The recommended way to answer all these questions is to buy one of the many books, or study packs, that are available from book shops or wildlife centres. Expect to pay between £5 and £10 for a book which will introduce the youngster, to the world of the seashore, and enable the parent and older children to put a name to the commoner of the animals and seaweeds between the tides. Although, I think that some books are better than the others, just about all the books will help appreciate the world of small marine life.

EQUIPMENT TO TAKE

Bucket and spades are the standard seaside holiday fare. Do not load yourself up with too much equipment because somebody has to cart all the stuff around.

White buckets are recommended because crabs and their ilk can be seen easily against a white background. Brewing pails with lids, so the fish and crabs do not escape, are the most popular containers. The butterfly nets so often seen on ▶

◀ sale at seaside stalls are a complete waste of time: they are far too flimsy for pool dipping. A large net is not an essential, as crabs and other animals can be picked up by a careful hand. A medium-sized aquarium net (10cm) is the most useful choice on most shores. When clambering over the rocks it helps to have at least one hand free. The small net can fit in the bucket.

NATURESCOPE

Invicta Toys and Games Ltd produce a 'mobile laboratory' for examination of the small animals of ponds, as well as insects, etc, on land. It is supplied by Hogg Laboratory Supplies Ltd for £11.40 plus postage, and I received one of these useful tools to see if it was suitable for rockpooling on the shore.

It is a micro aquarium (you need to fill it with seawater) of clear plastic, with magnifying lens so that the smaller animals can be seen in close-up. It is lightweight (325 grams) with an adjustable strap so that it can be carried around the neck by a child of school age. This means that the youngster can have both hands free.

A few instructions are included, and it is worth repeating some of the important rules:

(1) The small creatures should not be kept in the container of seawater for a period of longer than 15 minutes. If kept for any longer they may suffocate because of the lack of oxygen in the water.

(2) All creatures should be returned in exactly the same place as they were found on the shore. The animals will perish if returned under different rocks or into strange pools.

(3) All rocks should also be replaced exactly where you found them and the same way up.

It is an ideal piece of equipment for the child that shown a serious interest in the natural world.

A selection of sea anemones from the shore on a rock. The white species is the Plumose, Metridium senile, and the green anemone in the front of the picture is, the Snakelocks, Anemonia viridis. The red anemone on the right and the green anemone at the top of the rock are both the common Beadlet Anemone, Actinia equina.
PHOTO: ANDY HORTON

The Tompot Blenny, Parablennius gattorugine, eats sea anemones, as well as its usual diet of worms and small crabs.
PHOTO: ANDY HORTON

BOOKS FOR THE YOUNGER READER

Saltwater Life of Great Britain & Europe, by Leslie Jackman. Junior Nature Guides. Dragon's World Children's Books. 1995. ISBN 1-85028-295-1. Price: £7.95

Collins Watch Guide No. 5 Seashore, by Jean-Baptiste de Panafieu. Translated by Josephine Weightman. Harper Collins. 1997. ISBN 0 00-220088-0. Recommended Price: £5.99

There are many small guides that are also excellent.
Identification Guide for Adults

Collins Pocket Guide to the Seashore of Britain & Northern Europe, by Peter Hayward, Tony Nelson-Smith, Chris Shields. Illustrations by the Wildlife Art agency. Harper Collins, 1996. ISBN 0 00219955 6. Price: £12.99 and Special Offers.

Study Packs

Marine Environmental Education Resource Pack. Devon Wildlife Trust. 1997. Tel: 01392 279244 Richard White (Conservation Officer)

This study pack is specially designed for teachers wishing to take groups of children on activity adventures down to the seashore. It is ideal for first time explorers, but is not a comprehensive guide to the animals.

Marine Conservation Study Pack for Schools, by Carolyn Heeps and Sarah Welton. Marine Conservation Society. Tel: 01989 566017

This pack has a different emphasis on the conservation issues to do with the marine environment.

For for people going out on boats, the Marine Conservation Society also produce an information pack called *Ocean Vigil*.

Naturescope supplier: Address: Hogg Laboratory Supplies Ltd, Sloane Street, Birmingham B1 3BW. Tel: 0121 233 1972

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).

Dave Garratt takes on the big boys

The Heavy

The only connection that the species in this article share is their ability to grow fast and reach such a size as to make them unsuitable for a standard three to four foot marine tank. I would suggest that a 60x24x18in tank is the smallest size to consider for them. They do make for a striking impact in such a tank and (apart from the Moray) will often become a real pet, tame enough to be hand fed.

> These big fish do make for a striking impact, and, in most cases, will often become a real pet, tame enough to be fed by hand.

THE PORCUPINE PUFFER
(Diodon histrix)

Size/Origin/Availability: Can reach 36in in the wild but is usually limited to 12in in home aquaria. Widespread throughout most tropical waters. Common in the aquarium trade, often in a variety of sizes from 3 to 7in.

Feeding habits: An avid or even aggressive feeder once established. The natural diet of molluscs, crustaceans and meat-based foods can be readily catered for via commercial foods. However, as their fused teeth grow constantly, it is essential that some of their food must be provided with the tough exoskeleton still present, eg, Shrimps and Mussels with their shells intact. The Porcupine fish is very messy in its feeding habits, spitting bits of food all around the tank.

Aquarium needs: Excellent filtration, including efficient mechanical filtration and protein skimming, is required bearing in mind their messy feeding habit provides potential for a lot of waste. Despite their size they can be nervous and will therefore be happier if they have a cave they can retreat into.

Compatibility: *With own species:* Aggressive with own or similar shaped species. *With other fish:* Compatible with other fish although it may be wise not to keep them with very small fish. *With invertebrates:* Absolutely not, as they make up the major part of their natural diet.

Hardiness in captivity: Relatively hardy once settled in the aquarium. If under threat Puffers will inflate themselves to erect their spines to resemble a spiky ball. Do not encourage them to inflate and under no circumstances allow them to inflate with air (eg, by taking them out of the water if doing major work in the tank). Any transferring of these fish must always be done with them fully-submerged. They can also emit a lethal toxin if they are badly frightened. Although this is a rare occurrence, the aquarist must be aware of the possibility, as a tank wipe-out will occur if this toxin is released.

Similar species: *Diodon holocanthus* (very similar although slightly smaller), *Chilomycterus schoepfi* (the Spiny Boxfish). Other large, non-porcupine Pufferfish, are very similar in regards to diet, aquarium needs, compatibility and hardiness. They are the Dog-faced Puffer (*Arothron nigropunctatus*), Spotted Puffer (*A. meleagris*) and the Spotted Blowfish (*A. hispidus*). These Puffers can have a

PHOTO: GORDON WIDENS

Mob

PHOTO: NICK DAKIN

considerable life-span (seven years plus) in the home aquarium.

Summary: The saying 'beauty is in the eyes of the beholder' applies very much to this fish. Many hobbyists consider it a real character fish, this claim being enhanced by its reputation for becoming very tame; others may find its strange eyes and appearance give it a look more on a par with E.T.

THE SNOWFLAKE MORAY (*Echidna nebulosa*) ▲

Size/Origin/Availability: Will grow up to 36in in the wild but is usually limited to half of this size in the home aquaria. Found in the Indo-Pacific region and is fairly commonly available in the marine trade as small specimens of 6 to 8in.

Feeding habits: Morays are nocturnal predators that detect their food by smell. In the aquarium they require meat-based foods. This diet can easily be catered for via commercially-available frozen foods, eg. Lancefish, Squid, Mussel and Shrimps. They will obviously relish any live foods such as Freshwater Shrimps and will usually adapt to feeding during daylight hours.

Aquarium needs: As with all large fish that feed on bulky meat-based food very efficient filtration is required, including mechanical filtration and protein skimming. Morays make their homes in caves and crevices and as they will spend a great deal of time in this chosen home, this must be catered for in the aquarium.

Compatibility: *With own species:* No. *With other fish:* A Moray must not be kept with anything small enough to be considered food. Do not be fooled — bear in mind the size of their mouths, a friend of mine lost a 5in Butter Hamlet to a docile looking 12in Moray. *With invertebrates:* Cannot be kept with crustaceans as they will quickly become part of the Moray's diet. Could be kept with other invertebrates.

Hardiness in captivity: Morays make no great demands on water quality and are generally hardy and disease-free. As already mentioned they need many caves and crevices to feel at home in the aquarium.

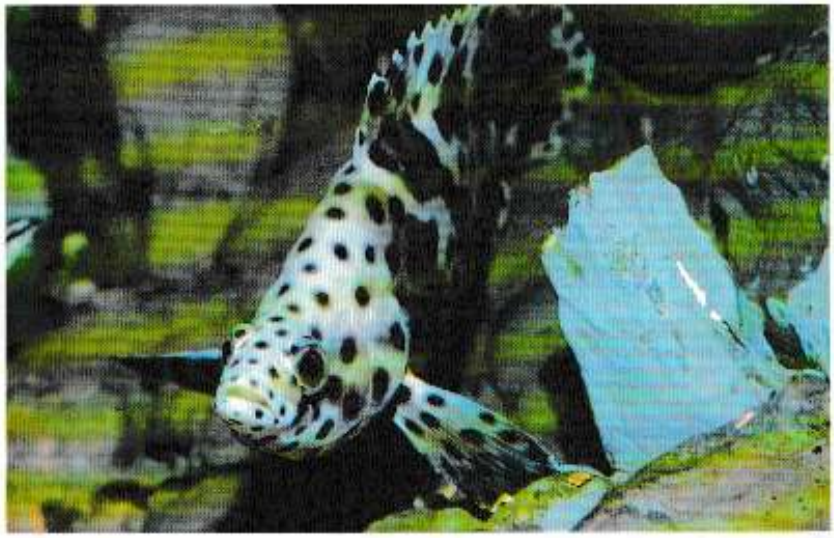
Similar species: Two other species are generally seen for sale, the Honeycomb Moray (*G. favaginus*) and the Leopard Moray (*G. tesselatus*). Both these species will achieve a larger size in the aquarium than the Snowflake will. They could reach over 3ft and as such are only a viable prospect in the largest of tanks.

Summary: The undemanding nature and general hardiness make the Snowflake Moray ideal for the beginner. Remember they need sizeable companions and they have extremely sharp teeth. Give it the respect it deserves, keep away from its teeth and do not attempt to hand feed a Moray.

THE PANTHER, or POLKA-DOT GROUPER (*Chromileptes altivelis*) ▼

Size/Origin/Availability: Will attain a size of 20in in the wild while easily reaching 10in in captivity. Found in the Indo-Pacific region and is fairly readily

PHOTO: MIKE SANDFORD



SOCIETY WORLD

Scottish Aquarists International Fishkeeking Festival

Jointly promoted by the Federation of Scottish Aquarist Societies and the Union of Scottish Aquarists this Holiday Weekend, to be held at Butlin's Wonderwest World, Ayr between October 3/6, 1997 inclusive, is available at £62 per adult, £31 for Juniors (age 2-14, under twos go free); a Single Supplement of £10 will apply.

The Weekend Break consists of: Friday — Evening Dinner and Bed; Saturday — Breakfast, Evening Dinner and Bed; Sunday — Breakfast, Evening Dinner and Bed; Monday — Breakfast.

Special Day Passes (8.30am midnight Sunday) are available at £10 Adult and/or £5 Junior. Only available through the Event Co-ordinator, see address below)

Ordinary Day Passes (11am-5pm) available at Wonderwest. Entrance £5.50 Adult and £3 Junior.

All the facilities of Wonderwest will be available.

Fishkeeping attractions will include the Scottish Supreme Championship (Tropical and Coldwater — All Best in Show Award winners are eligible), the Scottish International Open Show plus a new Scottish Junior Supreme Championship (open to any Junior winning a First Place in any Junior Class at any previous Open Show; proof of winning must be presented for entry).

Benching for all competitive Shows 9am-12noon Sunday, October 5, 1997.

Further details, Show Schedule and Booking Form available from: John Cowan, 'Etrouvel', 7 Warrenhill Road, Greenlea, Collin, Dumfries DG1 4PW. Tel: 01387 750606).

British Aquarists Festival Update

Plans are progressing for this the 46th British Aquarist's Festival. We haven't missed a year since its inception — a record which supports this Festival as one of the best in the country. One of the oldest maybe, but not stuck in the past.

The event is organised by the Federation of Northern Aquarium Societies and is fully supported by many leading Traders and Aquarists Clubs, including Specialist Societies. A number of Traders and Societies have already booked their space, so please let us have your booking as soon as possible, thanks.

As most people will know by now we expect more entries on THE CHAMPION OF CHAMPIONS STAND, together with our second Champion of Champion Contest for Coldwater Fish only, which will benefit all hobbyists. All Federations, throughout the country, who are there to promote and support fishkeeping, will no doubt back to the full *Aquarist & Pondkeeper* with their innovations.

All Federations and Specialist Societies are invited to participate in the Festival, by bringing their Stands, demonstrations, and to promote their own specialist side to the hobby. But please note: this is on a first- come, first-served basis as we may not have the room to accommodate all who wish to attend!

The general theme of the Festival this year will again be CONSERVATION and the Federation will be backing this theme with an exhibition of fish bred under the FNAS Breeders Schemes, with members explaining how they were bred, water conditions, habitat, etc. We hope this will encourage more members, and new Aquarists, to turn their hand to breeding and rearing fish.

Again this year, the HABITAT TANK COMPETITION will be open to individuals, Societies and Specialist groups. The Final of the AQUARIAN AQUACHAMP COMPETITION will be held at this year's Festival.

PLEASE NOTE. We have a change of venue for this year's Festival, the oldest Festival making only its third change of venue in 46 years so I think you will understand we only move for the improvement of the Festival. Bar and refreshments will be available together with free parking.

The new venue is The George H. Carnall Leisure Centre, Kingsway Park, Urmston, Trafford, Manchester, which is only 100 yards from Junction 4 of the M63 Motorway. Admission — £2.50 Adults, £1.50 Children and OAP. ▶

DIARY DATES

AUGUST

5 Gloucestershire A.S. Bell & Cawl, Cattle Market, St Oswalds Road, Gloucester. Slide Show, topic to be announced. Contact Andy 01452 372948 or Christine 01242 520478.

17 A.S.A.S. Convention. 11.15am. Buckland Community Centre, Mullen Road, Portsmouth. Speakers: Justin Bell of Chester Zoo and Stan Langdon. Buffet Lunch and Auction. Tickets £5 from: Southampton (Alan Stevens 01703 901200), Portsmouth & Hants (Jack Stillwell 01705 691030), Surrey (Bill Slade 01444 232341), Isle of Wight (Les Pearce 01983 613457), Sussex (John Smith 01273 602467).

25 Valley A.S. Aquatic Exhibition at Merthyr Show, Cyfarthfa Park, Merthyr Tydfil. Information from: A. Roberts, 01443 692756.

OPEN SHOWS

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

10 August Whitby A.S. (N)

10 August Salisbury A.S. (FB)

24 August Tyne Tees Area Association (I,B)

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. (FN)

6 September Bristol A.S. (I)

7 September Wyke Show Society (U)

13 September Hounslow A.S. (FB)

14 September Saltdean Show Team (FN)

20 September Plymouth A.S. (FB)

21 September NACG (FN)

21 September Mid-Sussex A.S. (FB)

27 September Northern Goldfish & Pondkeepers Society (I)

28 September Darwen A.S. (FB)

3/6 October Scottish Aquarists International Fishkeeping Festival, Wonderwest World, Ayr

5 October Halifax A.S. (FN)

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

19 October Selsey A.S. (FS)

19 October West Cornwall A.S. (FB)

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

31 October/2 November Supreme Festival of Fishkeeping, Weston

1 November National Junior Fishkeepers Open Show (FB)

2 November Supreme Championship & Open Show (I,B)

◀ Children up to six years accompanied by an adult free.

Dates — October 25/26, 1997. Open to public — 10.00am until 6.00pm.

The first British Aquarist's Festival, sponsored by *Aquarist & Pondkeeper*, was held on May 2/5, 1951 at Belle Vue, Manchester. The opening line to the first advert was: 'We invite aquarists throughout Great Britain to co-operate with us in presenting an aquarium Exhibition worthy of this Festival Year'. Although this is not a 'Festival Year' this still applies to this year's Festival; you will all be made very welcome.

For further information, contact Festival Organiser: A. Chadwick, 9 Bronville Close, Chadderton, Oldham, OL1 2RH. Tel: 0161 462 6207. Or B. Walsh, 9 Marsh Terrace, Darwen, Lancashire BB3 0HP. Tel: 01264 776567.

Association of Aquarists

The Association of Aquarists has completely revised this year's Size Guide, by far the largest and most comprehensive revision to date, thanks mainly to the efforts of Andy Pearce and Paul Dean. Andy has written a preface as an explanation of the best way to use the Guide, from both the novice and experienced exhibitor's point of view alike. Once again, the Size Guide incorporates a comprehensive General Index to enable the exhibitor to enter fishes in the relevant Class(es).

In preparing the Guide thanks must go to the following: Kevin Webb of the Anabantoid Association of Great Britain, for Class 4 updates; Colin White and Dave Wood of the British Killifish Association for Class 5; Brian Walsh of the Northern Area Catfish Group and Chris Ralph for Classes 6 & 1; Derek Lambert of Viviparous, for Livebearers; Dave Caesar for the newly-created Classes 21a and 21b.

There are very few Classes which remain unchanged. Class 21 (Native and Foreign Coldwater) has been divided into two sub-Classes, with more than 400 new entries. In total nearly 2,000 new entries have been added to the Size Guide. As a result of the increased number of entries it was decided to change the format in order to keep the production costs down. The Guide has been formatted in double columns to give even better value for money. This is our bit to be environmentally friendly, and hopefully it will be permitted on recycled paper!

The Judges and Standards Committee is always happy to receive suggestions to further improve the Size Guide. These can be sent via either the Membership Secretary or the Sales Officer whose addresses are below.

The cost of the Size Guide for members is £5 and £7.50 for non-members if collected at any of our Shows and events. Size Guides can be posted out for an extra cost of £1.50. To purchase a Size Guide contact the Sales Officer, 5 Napoleon Drive, Basingstoke, Hants RG23 8DW.

To join the Association contact: the Membership Secretary, 2 Telephone Road, Southsea, Portsmouth, Hants PO4 0AY.

Scottish Aquarists International Fishkeeping Festival

Jointly Promoted by the Federation of Scottish Aquarist Societies and the Union of Scottish Aquarists

Breakaway Weekend

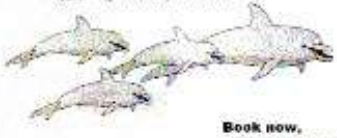
Butlin's

Wonderwest World Ayr

3rd October - 6th October 1997

Scottish Supreme Championship (Tropical and Coldwater) and the Scottish International Open Show

Benching for both the supreme championship and the international shows 9am - 12pm Sunday 5th October 1997



Book now, before it's too late!

New Competition for Weston '97

UK SOCIETY FURNISHED AQUARIUM CHAMPIONSHIP

The Rules for this exciting Society-participation Competition at Britain's brightest Fishkeeping Weekend, the SUPREME FESTIVAL OF FISHKEEPING, are as follows:

(1) Aquaria will be a minimum of 24x15x12in and a maximum of 72x15x12in with either clear or monochrome backs and sides.

(2) Each Society may enter one Tropical and one Coldwater Exhibit.

(3) Lighting must not be coloured.

(4) Exhibitors may bring aquaria already set up or aquaria of 24x15x12in with lighting will be provided.

(5) Aquaria must be set up 12 noon Saturday.

(6) Aquaria will be judged by two members of each participating Society between 1.00pm and 4.30pm on Saturday in order that Awards can be presented at the Dinner.

(7) Societies must not judge their own exhibits otherwise such points will be void.

(8) Judging should take into account the following: (a) FISH; (b) PLANTS; (c) ROCKWORK & GRAVEL; (d) DESIGN

(9) Points will be awarded as follows: four for each first position, three for each second, two for each third, and one for each fourth.

THE WINNER WILL BE THE ONE WITH THE MOST TOTAL POINTS.

In the event of a tie the Society holding most 'Firsts' will win; if it is still a tie then the most 'Seconds' will be taken into consideration and so on, until a clear winner is found.

Entry Forms (TO BE COMPLETED AND RETURNED BY OCTOBER 17, 1997) are available from: Mr J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, Hants PO3 6LD. Tel: 01705 691030.