AQUARIST & PONDKEEPER

APRIL 1997

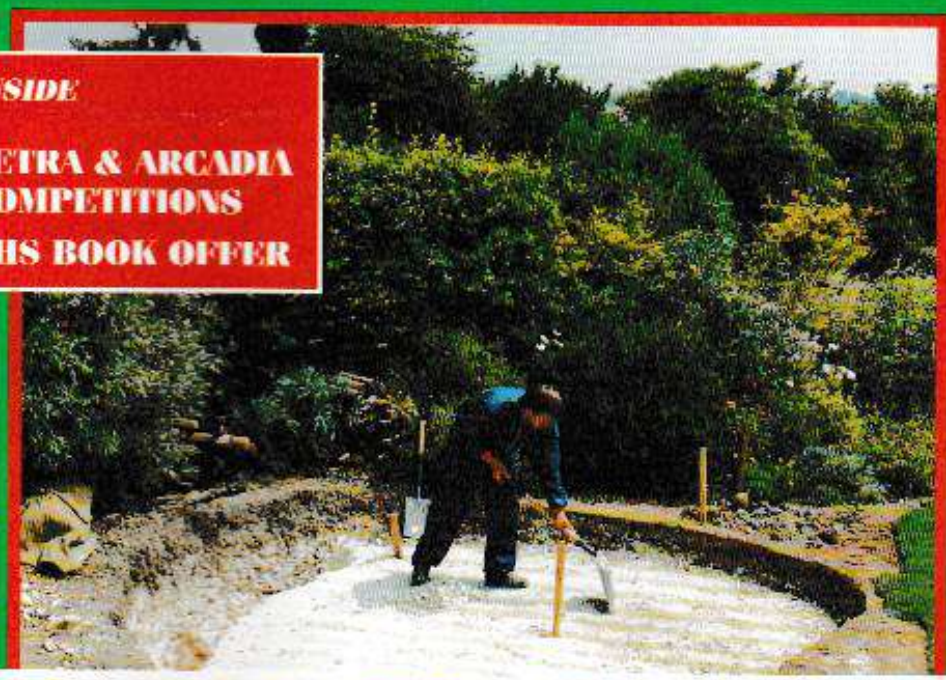
£2.25

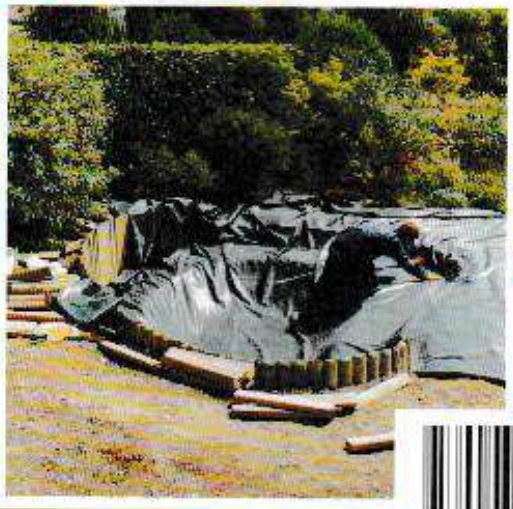
The Better Fishkeeping Magazine

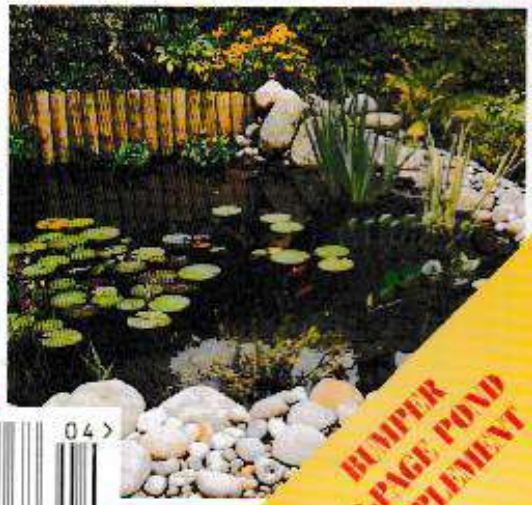
INSIDE

TETRA & ARCADIA COMPETITIONS

RHS BOOK OFFER







BUMPER 48-PAGE POND SUPPLEMENT

9 770003 727068 04

CONTENTS

APRIL 1997 VOL 62 NO 1

AQUARIST & POND KEEPER

EDITOR
Dick Mills

ART EDITOR
Mick Beeken

ADVERTISEMENT MANAGER
John Young
Tel: 0181 906 8886

SALES EXECUTIVE
Ian Hunter
Tel: 01233 636349

PUBLISHED BY
MJ Publications Limited,
Caxton House, Wellesley Road,
Ashford, Kent TN24 8ET

TELEPHONE: SUBSCRIPTIONS/ ADVERTISING AND PRODUCTION/ CLASSIFIEDS & BUYERS GUIDE/ACCOUNTS
01233 636349

FAX NUMBER
01233 631239

SUBSCRIPTIONS
Rates on application.
All subscriptions payable in advance to:
MJ Publications Limited,
Caxton House, Wellesley Road,
Ashford, Kent TN24 8ET

Litho origination by
MJ Publications Ltd.,
Ashford, Kent
Colour reproduction by Ashford Scanning Ltd., Ashford, Kent
Printed by Headley Brothers Limited, Ashford, Kent

Distributed to the Newstrade by:
UMD Ltd., Tabernacle Street,
London EC2A 4BN

ISSN 0003-7273

Opinions expressed in any article remain those of the author and are not necessarily endorsed by the Editor nor by MJ Publications Ltd.

Correspondence requiring response or return of any material supplied must be accompanied by a stamped addressed envelope.

Whilst every care is taken to ensure accuracy of content, MJ Publications Ltd will not be held responsible for any inaccuracies, distortions, copyright infringements or otherwise commercially damaging claims in respect of products advertised. Any such instances are liable to face action by third parties suffering as a result. Advertisers are reminded to refer to conditions of booking.

Features

COVER PICTURES

There can be no doubt about the main focus of A&P this month as the pond season gets off to a flying start with our major 'How To' Supplement on everything you need to know about pond installation.

Photos: COURTESY OF TETRA

Regulars

A&P GIVES DOUBLE SERVICE TO READERS AND ADVERTISERS: — Readers: Our display advertisers always gives you the best aquatic merchandising sources but now you can shop for A&P itself here, too. Where you see the A&P logo within each box, you can be sure of obtaining A&P at the same place.

INSIDE

Bumper 48-Page SUPPLEMENT

POND DESIGN AND INSTALLATION

See Page 27

Editor's Note: Due to the much enlarged Pond Supplement we regret that some articles planned for this issue have been held over until a later issue

Comment

Now that winter seems to be over — at least some of the Spring flowers in the garden seemed to have made up their mind in this respect — it won't be too long before the pond comes to life once more.

The fascination with the water garden is an ongoing attraction and many people will either be looking to upgrade or modify their existing ponds whilst, waiting in the wings, are many more just about to take that first vital step of lifting the first turf from their lawn to make room for their first pond.

At this stage no newcomer can be quite sure where the path to water gardening will eventually lead them — will it be a wildlife pond, a Goldfish pool or a Koi pond? Each of these avenues offer much to interest the newcomer who may be quite oblivious of the diversity of charms awaiting. It is unlikely that any established fishkeeper today actually ended up exactly as was anticipated right back at the start.

To get newcomers off on the right course our Supplement this month takes you through the many important first stages in water gardening — what to plan for and how to go about it once you've decided.

Each of the articles looks at a specific area of interest but, such is the way of things, there may be an instance or two where our contributors actually find themselves talking about the same thing and we make no apologies for this. In fact, you may well come across a different viewpoint which we hope will encourage you to think even more carefully about your plans and ideas. As one writer puts it: "One of the attractions of a pond is that it can be planted and landscaped to your own tastes. As a result no two ponds look the same."

Herein lies the permanent reason for the continuing appeal of the water garden: it's always founded on the same basic concept — sights and sounds of sparkling water, peaceful pools to relax by, colourful pondside and aquatic plants — but with many individually-created differences. There is no definite 'right' or 'wrong' design path to be slavishly followed: if it's right for you then enjoy it — and even flaunt it!

EDITOR

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

OUT OF THE BLUE

Melanotaenia praecox, male under artificial light still a stunning fish

ROBERT KIRKUP DETAILS A HAPPY EVENT THAT WAS QUITE UNEXPECTED

PHOTOGRAPHS BY THE AUTHOR

Once in a while a new species of fish is made available to the hobby, and after looking at these species in our aquatic magazines, a percentage of readers will make an instant mental note to search out that particular species based only on a two-dimensional view: enter the 'Fish of the century'. Bold words you may say, not my words but those of Mr Heiko Bleher, a world famous ichthyologist and aquarist. Heiko is responsible for introducing many hundreds of species into the home aquaria, not just Rainbowfishes, but Discus, Tetras, Catfish, Sawfish etc. and who can doubt him. Heiko Bleher collected *Melanotaenia praecox* himself during his 1993 expedition to New Guinea. He returned to Aquarium Rio, Germany, with eight specimens which are now being bred but in small quantities.He has studied,and reproduced this fish, with water qualities of pH 5.5-8.5, G.H.3-20, temperatures of 20-30°C — a no-problem fish, not to be compared with the delicate Cardinal Tetra. Well, no matter if this was an easy or difficult species, I had to have at least a pair!

THE FISH OF THE CENTURY?

After my second year of studying this species I am in a position to put this statement to the test. To my mind, additional bonuses of an attractive species are:

Colour: That it will show the colours true to nature, that the colours will be stable when placed in an artificial environment, and that subsequent generations possess these same colours.

Water Conditions: Although a target is set that compares to the species' own habitat, a variation from this format will not be detrimental.

Feeding: Everyone prefers to feed commercially-prepared foods so will they be acceptable? Will the species take livefoods — other than its fellow tankmates?

Size: Is the fish large enough to see, without pushing your nose up against the aquarium? If it is on the small size will they shoal with numbers of their own kind or other species? If it is a large species will it tolerate being in company with other large individuals?

Breeding: Can this fish be reproduced by experienced or novice aquarists? As most species show an intensity of colour during breeding will the species be a secretive spawner?

In over 100 years of our hobby only a handful of species have come 'close' to collecting 'maximum' points on the above categories. Ones that have proven themselves by their staying power are the Guppy, Neon and Cardinal Tetras, Angelfish and Discus. There have been some recent collections of 'metallic' Rainbowfish and one of these — *Melanotaenia praecox* — is now looking to be among these popular pets.

THE HISTORY OF MELANOTAENIA PRAECOX

The *praecox* hails from New Guinea which, together with Australia and Sulawesi, possesses the world's most diverse marine fish fauna and highly unique freshwater fish, mammals and birds. The *praecox* was

first known to science thanks to the Dutch collector W. C. Van Heurn (the largest Rainbowfish in the hobby today is named in honour of him) who collected 31 specimens from a tributary of the Mamberamo, Irian Jaya, way back in 1920. Weber and Beaufort described the fish two years later, naming it *Rhombatractus praecox* (fishes of Indo-Australia, Archives 4:298). However the colour plates that were drawn from these 'long soaked in alcohol' specimens did not raise the eyebrows of aquarists, or most importantly, explorers willing to bring back live specimens from the vast impenetrable depths of New Guinea. No record exists from that time as to how beautiful the fish were. Maybe a lot more already-described fishes are waiting to be viewed for the first time in their living colours? The standard length of 160mm I feel has been confused with *Melanotaenia* Van Heurn also collected in 1920.

It was not until Dr Gerald Allen's Department of Ichthyology at the Western Australian Museum 14th expedition to New Guinea that the 'praecox' from 'out of the blue', became top of my wanted list. The expedition was to the western side of the island known as Irian Jaya in May 1991, to the unexplored Triton Lakes of which Lake Kamaka is the largest. Gary Friesen, the pilot of the aircraft Dr Allen was using, was also a keen aquarist and, when time permitted, he did some collecting of his own. At his home Dr Allen saw the true colours of *Melanotaenia praecox* and would make a diversion to study this fish in the wild. The aircraft took him to Dabra in the Mamberamo system where *M. praecox*, described as 'dazzling neon with red fins', were collected in the floodplains in a quiet pool of a small clear stream with a pH of 6.5. These were photographed and returned to the pool. As the primary goal of the expedition was the Triton Lakes, a further airflight and a trek through jungle awaited them. This would lead to the discovery of another blue metallic Rainbowfish, *M. Lake Kamaka* and a new species of *Mogurnda*.

This juvenile with blue edges to the fins is a female; sexual dimorphism can occur as early as six weeks.

I first acquired this species in the summer of 1995 from Mr Bart Ruijsbroek, who had a few thousand swimming around in his green fish-house. He was using six breeding tanks, of 36x18x12in deep, these were bare except for a wall of filter wool at one end of the tank. The fish would flock-spawn in the wool and the eggs could easily be seen 'eyeing up.' Around 20 *praecox* were in each of these tanks, and they were breathtaking; there are blue Rainbowfish available to hobbyists — the Burnett River Rainbowfish (*M. fluviatilis*), *Rhadinocentrus ornatus* **A&P** May 1990, and *M. lacustris* — each a nicer looking Rainbow than the last introduction, but the *praecox* leaves them in the shade. Have you ever seen petrol spilt on a garage forecourt and bright sunshine reflect onto it? You have blue mauve, indigo, purple, etc., all shimmering to be nearest the sun; this comes close to the rainbow of blues which seem to be on every scale. This is further complemented by an intense red in all the fins except the pectoral; the red forms a distinct V in the caudal. Of course breeders of these fish were not releasing adults, and with the demands of aquarists around the world juveniles of 1-2cm were all that are available, so they did for me nicely. With this nucleus of breeding stock set up in my fish-house, their aquarium was a quarantine tank of 16x14x7in — bare bottomed with a box filter, a few rocks and a clump of Java Fern. I was taken by surprise at how quick they settled into their new home.

The pH of my quarantine aquaria was 6.4, the GH 5 and the temperature 75°F (24°C). Feeding was a commercial growth food, *Cyclops*, *Daphnia*, Brine Shrimp and Whiteworm. As small as the fish were they still showed a lot of colour and rivalled my adult fishes in adjoining aquaria; they showed a gorgeous blue sheen to the body and yellow in their fins. As the weeks passed some of the fish began to change colour, the yellow fins took on a red tint, this later intensified into a signal red with a prominent V in the caudal — these are the males. Months later their bodies will become more laterally-compressed, heightening in the back and lowering of the stomach, similar to *Melanotaenia trifasciata* (**A&P** September 1989). What I was not prepared for was the appearance of fry after only five weeks — the quarantine set-up had become a maternity aquarium!

Accounts regarding the rearing of the fry had stated that they were difficult, and 90 per cent of the fry would perish in the first week because of their small size. The hatch percentage of my *praecox* was not good, but I know this is normal of juvenile Rainbowfish experimenting in replication (if you know the lifespan of a Rainbowfish, between 30 and 60 per cent of its years/months are its optimum spawning time).

As one of the most difficult Rainbows I have reared is *Inatherina wernen* (**A&P** November 1991) I treated the *praecox* with the same respect. I used shallow containers of one litre, the spawning plants were placed in these and a little food was sprinkled onto the water surface; this is to feed the infusoria already present among the plants. The size of an infusoria culture can be seen in a good light, by using a magnifying lens or, ideally, a camera with a macro- or telephoto lens and a reverse adaptor. The fry emerged from the egg after about nine days. The fry are small (around 3mm) and compare in size to *'wernen'*, but also to *R. ornatus* and the common *Melanotaenia maccullochi*, and it is to these later species that I would draw comparison to with regards to difficulty in rearing. Wernen can swim around in infusoria for four to six weeks with their

numbers dwindling, until we can feed them suitable foods more available to us. The *praecox* however require only a few days of 'magic water', and I then have them eating powder food, Brine Shrimp and Micro-worms. The most successful of foods, although difficult for me to obtain in winter, is *Cyclops*. These minute aquatic crustaceans are collected from my local pond. The whole colony is placed into the rearing tank; when the fry are around ten days old, the adult *Cyclops* feed on the infusoria and powder food and are constantly breeding and immature *Cyclops* abound at all levels of the aquaria. Whatever you have read about the dangers of feeding *Cyclops* (and indeed what I have wrote), disregard it — there are more pluses in having a constant supply of live food to fast-growing fry.

My first accidental spawnings of *praecox* were only small numbers, and having a constant array of fish breeding, these few *praecox* were added to top up already existing rearing aquaria. This, I thought had led to misidentification. The growing *praecox* are a yellowish-orange; they swim at all levels of the aquaria and resemble the Forktail Popondetta Rainbow *(Pseudomugil furcata*, **A&P** June 1989). So, as my first spawnings were not planned, I considered the possibility that the eggs in the quarantine tank contained *furcata* eggs introduced from another aquarium.

However, after eight weeks, this colour drops to a grey, and then a blue sheen appears on the sides of the body which intensifies with age, and after only 15 weeks you have an eye-catching dazzling shoal of fish. In comparison, *Glossolepis incisus*, the Red Rainbowfish, take much longer, with quality males showing their colours between 12–24 months; the same is so for *M. trifasciata*. Is this reason that commercial breeders are allowing species and genera to inter-breed in their breeding pools? A colourful juvenile, or a 'New' species can be sold at an earlier age.

Among the many rearing tanks I have of *praecox*, the pH. varies from 6–7.8, the G.H. reads between 3–12, temperature 68–80°F. The fry grow to maturity with various companions, not just Rainbows but cichlids, *Panaqyprichromis nigripinnis*, *Lamprologus caudus* and *speciosus*, *Microgeophagus ramerezi*, catfish *Corydoras* and *Rhineloricaria* and *Sawbwa resplendens* with no problems regarding bullying and pecking orders. After five months the fry are around 25mm in length, as big as an adult Cardinal Tetra, and at the size I first acquired their parents.

Further planned spawnings of the species showed that it was typical of other Melanotaeniidae; the male or female will wait over a spawning site, usually a planted area. When the opposite sex arrives, they will dance around the site, shimmying side by side, and then releasing a half a dozen eggs or so; these sink to the floor with tiny threads and attach themselves to anything they touch. The pair of fish may be joined by other males or pairs, eager to get in on the action. Spawning will occur throughout the day but especially when the animals are soaked in sunshine. The males do not appear to show a nuptial stripe, if they do it covers the whole body; the fry emerge from the egg after seven to nine days.

Looking back at the photographs and video footage I had taken of the parents of my fish I realised there was something missing, just as a Guppy (*P. reticulata*) will be better coloured when your lights are off — reflected sunlight can bring out colours you did not think were there. The *praecox* body and eye-colour was not as deep, or as three dimensional. So an aquarium was once again set up in our living room, where the adults could receive an ample supply of natural daylight. Now family and visitors to our home (whether they keep fish or not) stand in awe, gazing at the never-ending displays and shoaling of a truly superb species. Although this is the end of my account of this new species I believe my fish are still young: I have other species of Rainbowfish that are eight years old. Colours and shape have changed dramatically as they have aged and the same may be so of the *praecox*. I hope that the genetics of this fish will be left alone so that the species can be enjoyed for years to come, and not fall victim to the tampering that results in a great many 'dull' looking Rainbows, eg, *M. lacustris* and *M. boesemani*, whose natural colours are also quite stunning. *Melanotaenia praecox*, however, is a fish that will leave you feeling blue until you add them to your collection.

ACKNOWLEDGEMENTS:

For making us aware, to Dr G. R. Allen, Mr Heiko Bleher and Ben Ruigsbroek, for further information regarding this article, write to 'Exotics and Tropicals Club', c/o 30, Thorngill, Albany, Washington NE37 1RF.

aqualine

Sophisticated products from Germany

- AQUARIUM LIGHTING SYSTEMS UTILISING 10000K & 5000K LAMPS 70w 150w 250w & 400w
- COMPLETE PLANT CULTURE METHOD — ADDITIVES, CO_2, FERTILISERS & SUBSTRATES
- COMPUTER CONTROL EQUIPMENT

Distributed in the United Kingdom by

ALPHA AQUARIUM 01932 353600

Consciously better aquarium products

IMPLICATIONS OF KEEPING KOI

IF YOU'VE EVER TOYED WITH THE IDEA OF KEEPING KOI, THEN **BERNICE BREWSTER** SUGGESTS YOU CONSIDER THE FOLLOWING ...

PHOTOGRAPHS BY THE AUTHOR

With the arrival of the summer months many of us spend more time in the garden and, as a consequence, make a few trips to the local Garden Centre, which these days usually incorporates an aquatics section. Few of us can pass by the opportunity of spending a few minutes to walk around and admire the variety of water plants and cold water fish which are available for the garden pond. Of the many varieties of cold water fish which are available there can be no question the ornamental varieties of Carp, popularly known as Koi, have the most spectacular colours and patterns.

Aside from the colour of Koi they appear to be very boisterous in the aquatics centre, rushing over in a great frenzy to any person standing alongside the pond and who just might be prepared to feed them. It is very easy to understand how these fish can become very endearing and considered to be a desirable addition to any garden pond but is 'any garden pond' suitable for the welfare of Koi?

The first point to take into consideration is the size and depth of the pond into which the Koi are to be introduced. Koi, like their wild cousins, grow very rapidly if the water conditions are suitable and while the baby fish may appear to be suited to the small pond they may rapidly grow too large and the problem arises of either finding them a new home or constructing a larger pond. Ideally, the pond should have a depth of about 4ft, although the pond can be designed to have some shallow areas, particularly if it is hoped the Koi might breed when they reach adulthood. The deeper water gives the bigger fish room to swim and plumb the depths, helping to keep them fit and lithe.

The deeper water has two important functions. It allows the fish to dive to the pond bottom and avoid a number of predators such as Herons, Cats or Foxes. The second factor has been a disputed area in recent months that in the winter, a deeper pond forms a 'warmer' layer of water at the bottom where the fish will lie. There can be no question that any shallow garden pond of less than 1.5m is subject to temperature fluctuations, simply because shallow water heats and cools rapidly. It is probably correct to say that in certain areas of the pond, near to or at the bottom, the water will form a stable layer, not subject to water movement or affected by wind chill factors and it is here the fish will be in a torpid state. Torpid fish are largely inactive, not feeding and all body functions reduced to a minimum; as a consequence the fish are only producing a very small amount of nitrogenous waste and, in the absence of food, no solid waste as faeces, the demand on the filtration system is therefore minimal.

Deep water poses an additional problem for parents of young children as water and children can be a fatal combination. Bearing in mind the Koi pond needs to be fairly deep it is important to consider whether it is suitable in a

garden where children are likely to play. It may be necessary to fence off the part of the garden where there is a Koi pond until the children are old enough to understand the dangers associated with the pond. It is not just a question of being able to swim which is important, many Koi ponds are steep sided and the sides are usually coated with slippery algae, which can make it difficult to climb out.

The recommended stocking ratio for cold water fish is 24 square inches (150 cm²) of water surface area for each inch (2.5cm) of fish, including the tail (Butcher, 1992; Stroskopf, 1993). This rate of stocking fish into the cold water pond allows for growth and for the fish to reproduce, which is only natural after all. So, what does this imply? It is better to plan and then construct a pond specifically for Koi rather than adding them to an existing pond which is unsuitable leading to any number of problems, including stress to both the owner and fish plus outbreaks of disease in the latter.

The purist Koi keeper prefers to have a crystal clear pond, which is devoid of any plant life, or any other feature which might detract from the beauty of the Koi. The Koi pond is constructed to include a large filtration system, which acts as a sewage treatment plant to break down the fish waste. Fish produce nitrogenous waste in the form of ammonia, which in an established filtration system is broken down through the activity of bacteria and other micro-organisms to nitrite and then nitrate.

Ammonia is extremely poisonous to fish, damaging the delicate gill structure and causing changes to the blood, which affects its ability to carry oxygen and if this pollutant is allowed to accumulate the health of the fish deteriorates and the Koi will die. Nitrite is also very harmful to the fish, being a skin irritant causing the fish to rub and injure themselves but more sinisterly, this substance will bind very tightly to the red oxygen carrying pigment in the blood. The combination of the nitrite and the red pigment prevents the blood from carrying vital oxygen from the gills to the tissues and gradually as more and more blood cells are affected the poor fish effectively suffocates. Nitrate is not supposed to be especially harmful to freshwater fish but it is a good plant fertiliser and will promote the growth of nuisance algae such as Blankerweed or Green Water. These days most of the Koi keepers have ultra-violet light units fitted to the filtration system and these kill the algae by damaging the green pigment which allows the cells to produce nutrients using energy from sunlight and dissolved carbon dioxide, a process known as photosynthesis.

Most filters on Koi ponds have at least two parts to the system, the first is mechanical and designed to remove the solid wastes from the pond. The second part of the filter is biological and it is here the micro-organisms which break down the waste produced by the fish are encouraged to thrive. The mechanical filter may be in the form of brushes, sponges or a vortex

KOI
Implications of Keeping Koi

unit and this is frequently flushed to waste — in the summer months at least on a daily basis to remove the solid waste and prevent it from contributing to the ammonia content as it decays.

Broadly speaking, there are two other types of garden pond. The wildlife pond has very few fish and is well planted with both submerged and marginal aquatic plants and is designed to encourage animals such as Newts, Frogs, Toads, Damselflies and Dragonflies to visit. The clarity of the water is of no consequence to this type of pond and there is little point in adding Koi as they will rarely be seen. If the pond is designed to encourage wildlife to visit the pond the addition of Koi will be a problem as Tadpoles make a delicious snack!

The second type of pond has fewer aquatic plants and often quite a large number of fish. Often there is a small filter added to the system, which is utilised in the summer months. In this type of pond the ammonia produced by the fish is utilised directly by the plant life but in the summer, when the fish are very active, the filtration system just supplements the activity of the plants in keeping the water free of any pollutants. The problems of adding Koi to this type of semi-natural pond are several. The pond tends to have silt on the bottom, which is derived from the soil in which the plants are growing plus an accumulation of detritus over a period of time. Koi are just ornamental varieties of Carp, which are by nature bottom feeding fish, searching amongst the pond sediments for any juicy morsel. We use floating foods purely so that we can enjoy their delightful colour patterns. Although the Koi will initially enjoy being stocked into this type of pond they will rapidly stir up the sediment on the bottom and very rapidly turn the water into a cloudy, muddy pond where they will be seen only rarely. Most aquatic plant life is a great delicacy to the Koi and they will readily consume delicate new shoots and rapidly deplete the plant life. The muddy water prevents any light from reaching any submerged aquatic plants such as Parrot's Feather or Canadian Pondweed and, as a consequence, the plants die and begin to rot in the water.

Koi are very active fish and will produce a large amount of both ammonia and solid waste. Plants are in fact the most efficient way of removing ammonia from the pond as they will utilise this as a direct source of nitrogen for growth but the damage caused by the Koi feeding on them disrupts growth often killing the plants as the injured leaves cannot produce sufficient nutrients to sustain the plant.

As stated above the muddy colour of the water kills the submerged plants which then start to decompose. The stability of the pond is altered, the fish are producing ammonia, the submerged plants are dead and decaying to give rise to further ammonia and the Koi have eaten the plants which might have helped to reduce the levels of this pollutant. Although there is a filtration system on this type of pond, until the addition of the Koi it simply supplemented the activity of the plants.

Suddenly the filter is needed to remove large amounts of ammonia from the water and it simply is not fitted to undertake this task. The water quality deteriorates and the fish begin to get sick and then die.

The potential disaster which can occur from keeping Koi in the semi-natural pond emphasises the point that the pond should be designed for keeping Koi and not adapted from an existing but unsuitable pond. Ideally, the pond should be designed with the ease of circulating water in mind.

Irregular shapes become difficult to circulate water effectively, leading to areas of stagnant or dead water.

Of all the fish we choose to keep in the garden pond, without any doubt, Goldfish are the most tolerant of poor

A COCKTAIL OF SHRIMPS


Cleaner Shrimp, *Lysmata amboinensis*

NICK DAKIN SERVES UP A TRADITIONAL STARTER DISH — FOR THE MARINE AQUARIUM

PHOTOGRAPHS BY THE AUTHOR

When the aim is to add an overall combination of movement, rich colouration and interest to our reef tanks we nearly always look to fish to provide it. However, there is a complimentary alternative: Shrimps!

Whilst the range of Shrimps cannot hope to compete with the numbers of fish available there are some distinct advantages in choosing these delightfully endearing creatures. For example Shrimps do not have to be protected against diseases; many species are extremely colourful and quickly become hand tame at feeding times; impressive groups can often be kept with little trouble; other invertebrates, both sessile and mobile, are usually ignored and left unharmed; Shrimps are relatively cheap and produce little waste. As can be seen the list makes tempting reading and marinists who keep mixed reef-type aquaria would do well to consider the merits of investing in a Shrimp or two!

SHRIMPS, OR SHOULD THAT BE PRAWNS?

If you play *Trivial Pursuit*, or any game of intellectual skill, here is a question guaranteed to put you ahead: what is the difference between a Shrimp and a Prawn? The answer is not as difficult as it seems, for there is no difference. They are one and the same! The terms are fully interchangeable, even though they are often surrounded in totally unnecessary confusion.

CRUSTACEANS

There are well over 40,000 species currently described by science in the phylum Crustacea but the real total, including estimated, undiscovered species, could easily exceed double that figure! Crustaceans were, up until recently, grouped with the Arthropods and as such, would have contributed to form of the largest phylum in the animal kingdom (indeed, some scientists continue to make little or no distinction and the matter is yet to be totally resolved). The phylum Arthropoda therefore remains relevant to this discussion as close relations could still include such familiar animals as the arachnids, insects, centipedes and millipedes along with a myriad of lesser-known smaller groups. The word arthropod literally means 'jointed foot' and a unifying feature of all arthropods is that their appendages are all jointed. The vast majority of species carry this a step further and possess segmented and jointed bodies as well.

Along with Crabs and Lobsters Shrimps are placed in the subclass Malacostraca order Decapoda. As the name suggests decapods have ten feet, arranged in five pairs. Some are highly modified, forming pincers or claws, useful for eating or defence.

consider the secret of success to be down to a major water change (80 per cent) every week with high quality water mixed to exactly the right matching temperature and Specific Gravity. Indeed, I drew from a sump of pre-mixed saltwater that enabled four consecutive identical water changes. Delays in performing a water change were signalled by a decrease in the appetite of many of the specimens. I estimate that a five gallon tank could happily support up to six varying individuals comfortably. Blood Shrimps, Dancing Shrimps, Monkey Shrimps, Cleaner Shrimps and Common Prawns were all kept peacefully within the same aquarium.

Potentially more aggressive species such as Boxing Shrimps and Tiger Shrimps were avoided, as were the more sensitive Anemone Shrimps. At no time were any other invertebrates considered. Molluscs, for example, were sure to be eaten in such close proximity!

For all those budding marinists with extremely limited space, perhaps this could be the answer (or at least part of it). If readers try it, I would be delighted to hear of their efforts.

PREDATORS

Even though reef tanks are usually thought of as perfect environments for Shrimps there are a few compatibility problems that may need resolving. Natural predators of decorative Shrimps include: Hawkfish, Marine Bettas, Mantis Shrimps, Lobsters, Elephant-Ear Polyps, some Sea-Anemones (Condylactis spp., Pachycerianthus spp.) and some species of Crab. Not all individuals featured in this list of species are inclined to predate and some may live in complete harmony. However, a significant proportion find all Shrimps an irresistible delicacy. Generally speaking, the omission of these potential predators is to be recommended.

IDEAL TANK CONDITIONS

Reef tanks make an ideal habitat for most Shrimps. Aquaria exceeding 91 litres (20 gallons) nett are preferable. Rocky shelters providing temporary retreats are appreciated, especially when moulting.

Ammonia-nitrite — zero; pH — 8.1-8.3; temperature — 24-26°C (75-79°F); nitrates less than 10ppm; S.G. — 1.022-1.025; phosphates — less than 0.5ppm. Efficient protein skimming and activated carbon filtration as standard. 15-25% high quality water changes every two weeks. Lighting — arranged to suit other livestock, unimportant to Shrimps.

FEEDING

Shrimps will soon learn where and when to expect food in the aquarium environment. Any meaty marine fare is greedily accepted. Brine Shrimp, Squid, Lancefish and Shell meat are all good choices. On no account let Shrimps scavenge exclusively as they rarely manage to find enough to sustain them.

COMMON SPECIES

The following species are commonly found in the tanks of most marine retailers on a regular basis:

Cleaner Shrimps (*Lysmata amboinensis* and *L. grabhami*). One of the most popular Shrimps owing to a stunning red and white livery. Will live happily in groups or as individuals and can quickly become hand-tame.

Boxing Shrimps (Stenopus spp.) Gain their common name from the menacing, outstretched claws. Best kept singly as pairs may fight. They have a relatively shy disposition and tend to hide amongst the rockwork (until feeding time!).

Dancing or Candy Shrimps (Rhynchocinetes spp.) are a communal species and should be kept in groups.

They are entirely peaceful, cheap, attractive and easily fed.

Blood or Scarlet Shrimps (*Lysmata debelius*). Although quite expensive this stunning Shrimp is not difficult to keep and is totally peaceful. Best kept in small groups.

Saron or Monkey Shrimps (*Saron rectirostris*). This species is highly camouflaged and tends to hide during the day. It will freely scavenge if the lighting is moderated to twilight conditions. A peaceful and cheap species.

Dancing Shrimp, *Rhynchocinetes uritai*.

Anemone Shrimps (Periclimenes spp.). Yes, there are even Shrimps that will safely live in the tentacles of certain 'clownfish-type' Anemones for protection. They are generally transparent with delicate markings and are not difficult to maintain. Do not keep with Caribbean species of Sea-Anemone unless definitely identified as a Caribbean species of Shrimp. Do not encourage Clownfish to occupy the same Sea-Anemone as they will soon harass this 'intruder'.

Glass Shrimp (*Palaemon elegans*). This is an eastern Atlantic and Mediterranean species familiar to many European marinists as the Common River Shrimp (although several other species also fall under this banner).

Often used as live food for large, predatory fish, it is, however, an attractive Shrimp and does very well in the tropical marine aquarium. It has a voracious appetite and must be kept well fed if delicate invertebrates are not to be nibbled.

SPECIES NOT RECOMMENDED

Mantis Shrimps (Odontodactylus spp.). These highly predatory Shrimps will readily kill other Shrimps and small fish. Can be kept as a single specimen in a small tank as previously outlined.

Pistol Shrimps (Synalpheus spp.). Are rarely seen but often heard as an irritating cracking sound (hence the name!) as they snap their claws shut.

Harlequin Shrimps (Hymenocera spp.). Whilst exquisitely beautiful this species predate exclusively upon live Starfish! The ethics of feeding live Starfish to them regularly in an aquarium situation must preclude them as a satisfactory choice.

Jackie's Juniors

Hi, Junior Fishkeepers, it's time for fun again. I was really pleased to receive a letter from Matthew Dunkinson about his new aquarium, he sounds as if he has learned a lot about keeping fish in the past four years as well as having great satisfaction with his fish since Christmas.

The puzzle this month is a little more tricky but I'm sure you won't have too much trouble in solving it.

Dear Jackie,

I received a 40in Juwel aquarium for Christmas and I was hoping to keep Geophagus steindachneri.

I set up my tank, and decided to use quite fine substrate, lots of bog wood, large rocks and many plants. I also used pieces of slate.

I left my tank for 10 days to settle down. Then I purchased my Geophagus on 4 January (one male and one female). Within the next day or so my male was courting my female. The two fish would go head to head and my male fish would rapidly shake his head from side to side with his mouth wide open.

I purchased another pair on 16 January and by 20 January I noticed that my first females' brood pouch was distended. On 23 January I noticed my other female laying eggs; she laid two or three eggs at a time.

After she laid two eggs she would suck them into her mouth and the male would then fertilise them. The next day, unfortunately, she had lost her eggs for some reason but my first female still had hers.

On 2 February I noticed a couple of fry and on 4 February in the morning I noticed the whole brood.

There was about 70 or 80 fry. They are growing quite fast and they have just started taking small pieces of flake fish food.

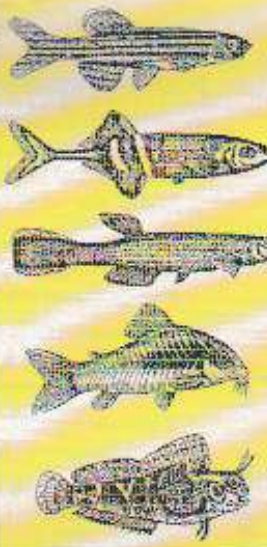
I thought I would write this letter to say that G. steindachneri is not as hard to breed as it is suggested in many fish books.

You may be interested to know I am 12 years of age and have now been keeping fish for approximately four years. I started with a 3ft community tank, which I still have. I also have progressed to keeping Kribs in a 2ft tank and my Steindachneri in my new Juwel tank. It may also interest you to know that I keep a pair of Red-eared Terrapins in a 4ft tank.

Matthew Dunkinson,
Brockenhurst,
Hampshire.

A DOUBLE PUZZLE TO SOLVE

Trace the fish to the name — and then unscramble the name!



SORRYDOCA

HIHSILKL

NYNBLE

BAROZIANDE

NOTEEPLENASH

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

NEXT MONTH

With the outdoor season now under way we will be looking at Koi. The popular **Three-Coloured Varieties** are put under close scrutiny together with **Koi Feeding and Genetics.**

On a smaller scale we shall be looking at **Self-Contained Water Features** which bring moving water right up to, and even into, the house or conservatory.

Of course we will not be neglecting other fishkeeping areas either so look out for the May issue of A&P at your newsagent or aquatic dealer.

POND DESIGN & INSTALLATION

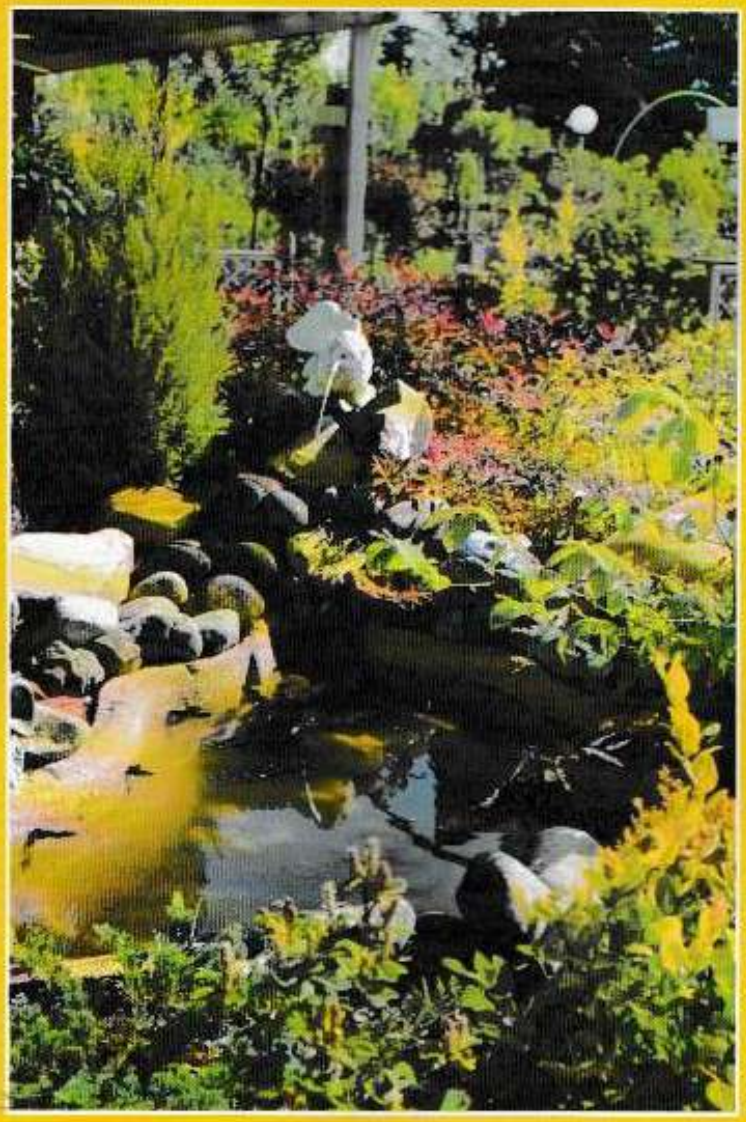


PHOTO: M-P. & C. PIEDNOIR

An AQUARIST & PONDKEEPER Publication

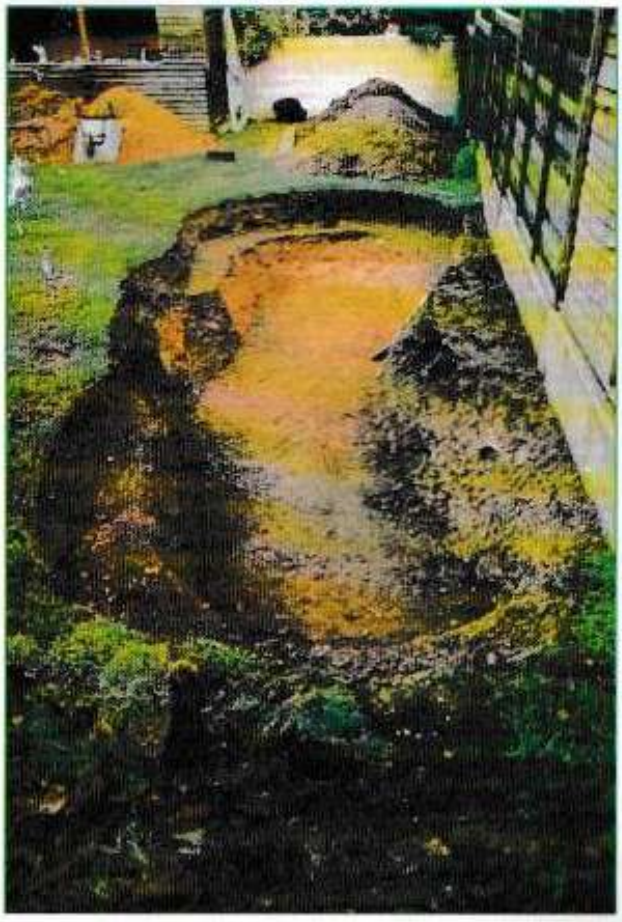
Supplement

POND DESIGN AND INSTALLATION

Planning a Water Garden

SUSAN STEPHENSON OFFERS SOUND CONSIDERATIONS BEFORE YOU START YOUR WATER GARDEN

PHOTOGRAPHS BY THE AUTHOR



Water in the garden enhances the natural beauty and offers a whole range of different environments from running rivulets to fountains and quiet still waters. In turn, these different environments provide habitats for many different plants and water creatures, wild as well as cultivated. However, a thriving water garden owes its success not only to its upkeep, repairs and attention to fish stocks but to its planning.

To plan a water garden you must first decide why you would like a water garden, the form it is going to take and what you want from it. Is it to be natural, formal, informal, symmetrical, rounded or square? Is it to be a showpiece or practical? Do you want to keep fish? How much time and money do you want to spend on it? There are many things to consider before the first spade is turned.

Is your pond going to be purely a design feature or do you intend to encourage plants, wildlife or keep fish? Do you want it to be both ornamental and practical? If you intend to keep plants and fish then you need to have minimal water disturbance caused by fountains and waterfalls. You can still have the sound of running water by using a trickle fountain or bubble fountain over a sphere

POND DESIGN AND INSTALLATION

which will limit the disturbance to the water. If the water garden is going to be simply an architectural attraction then you are not so limited and can have gushing fountains and rushing whirlpools if you wish.

At the planning stage it is a good idea to draw up a simple list of things which you want in the water garden as well as those features which will be necessary such as access from the house, etc.

The charts shown in this article are examples that were used to plan a small garden pond.

Now you know what you require from your water garden and the type you would like you need to decide where to site it. Is it going to be in the front or back garden, in the open or more sheltered?

The best site for a pond is an open one in full sun for a hour a day or more in summer as this will encourage plants to bloom well. it should be well away from deciduous trees or falling leaves could be a problem. You may have streams or waterways running to a from the pond itself and as these will contain moving water the plants there will be adapted to this so where you site these features is less limited.

Other factors which will influence where you site the pond are where you will view it from. If you install an expensive pond lighting system then you will probably want to view it from the house, if you have planned specifically for wildlife then a little distance between a bright, busy house might be better. If you intend to use the area around the pond as a seating area on summer evenings then you need to ensure the area is safe by providing firm walkways and adequate lighting.

Where features, equipment or lighting require power you need to consider how you will get the power there. Will you take a mains point out to the water garden site or will you run wires from the mains near or in

the house to the water feature. It may also be important to choose between mains or low-voltage equipment — there isn't always much difference either in price or performance between the two — and safety should always have the priority.

If you have children then you should certainly give careful consideration to the safety aspect, perhaps limiting your water garden initially to a wall spout or simple bubble-fountain with the water being stored in a hidden reservoir below the feature.

Again it's not a bad idea to set down your decisions (or questions and their answers) on a piece of paper to help you keep on course before you progress too much further.

After you have made your final decisions about the type, use, site and size of the water garden you can begin. It is a good idea to first lay out the water garden using either hose or sand. This way you can get an idea of the shape and scale without any digging and you can change things you don't like. You need to decide what material you are going to use for the actual pond construction.

Probably the best choice is a liner of butyl rubber which will prove strong, flexible and last a very long time. Rigid, pre-formed liners are easily damaged, hard to repair and limited in size and shapes and concrete presents its own problems from frost and cracking unless it is mixed precisely.

The pictures show a recently-constructed garden pond. After laying the outline in sharp sand the first excavation was made, then the liner, in this case concrete, was added and allowed to set. The walls were next laid and gradually the pond began to take shape. Later a rockery was added at one end to add more colour and variety. Without careful planning this fairly large pond (the spade gives an idea of size) could have proved a costly and time wasting error.

It may be that as you give the planning consideration you will change your ideas about the size, site and type of water garden that you will have but time spent planning your water garden is probably the most useful time you could spend in order to achieve a productive and practical water garden that will provide endless pleasure for a very long time.

WATER GARDEN PLANNER

Feature	Essential	Would like	Not wanted
Water plants			
Fish			
Waterfall			
Fountain			
Watercourse to/from			
Statue/ornaments			
Bridge/walkway			
Flowering plants			
Bog garden			
Wall			
Troughs			
Pump			
Filter			
Heater			
Lighting			
Wildlife			
Poolside seating			

This second list is things which you should consider before making a start on your water garden. It is worth writing them in chart form and adding comments as each element is decided.

	Considerations
Site	Is the site suitable, do you have the views you want.
Size	How wide, long, one depth or several. Will there be one main pond or several small ones.
Lining	Concrete, pre-formed or plastic/rubber sheeting. How much will you need for the size of pond.
Shape	Rounded, square, angular, materials for the surroundings to complement the shape (bricks, stones, rocks, plants, etc).
Type	Formal/informal, for fish breeding, wildlife, flowering plants, etc.
Access	Paths to the pond, walkways, etc.
Surrounds	Bog garden, walls, concrete, wood, bricks, etc.
Power	How will you get power to the pond if needed.
Safety	If you have children you should consider this carefully. Also, how will you protect fish stocks from cats, herons, etc.

The Enchantment of a Water Garden

The sight and sound of running water adds a touch of magic to any garden. At Wildwoods you will discover the most complete range of fish, plants, ponds, liners, pumps, fountains and accessories to create your very own water display

SEND FOR CATALOGUE AND PRICE LIST

Open 7 days a week

Wildwoods

Wildwoods Water Gardens, Theobalds Park Road, Crews Hill, Enfield, Middx EN2 9BP. Tel: 0181-366 0243 (South of M25 between junctions 24 & 25)

THE WATER GARDEN SPECIALISTS

POND DESIGN AND INSTALLATION

Installing a Pond in your Garden

DR DAVID POOL, OF TETRA, SHOWS HOW IT IS DONE

PHOTOGRAPHS BY THE AUTHOR

There are three main methods of garden pond construction, namely concrete, preformed ponds and flexible liners. The latter is by far the best choice in terms of price, ease of installation and durability.

Pond liners are available in several grades ranging from polythene sheeting to heavy duty butyl liners. Polythene sheeting is very cheap to buy, but quickly ages and begins to crack and tear within 1-2 years. Butyl liners are more resilient and are generally guaranteed for 20 years. As with most items the more you pay the better the product.

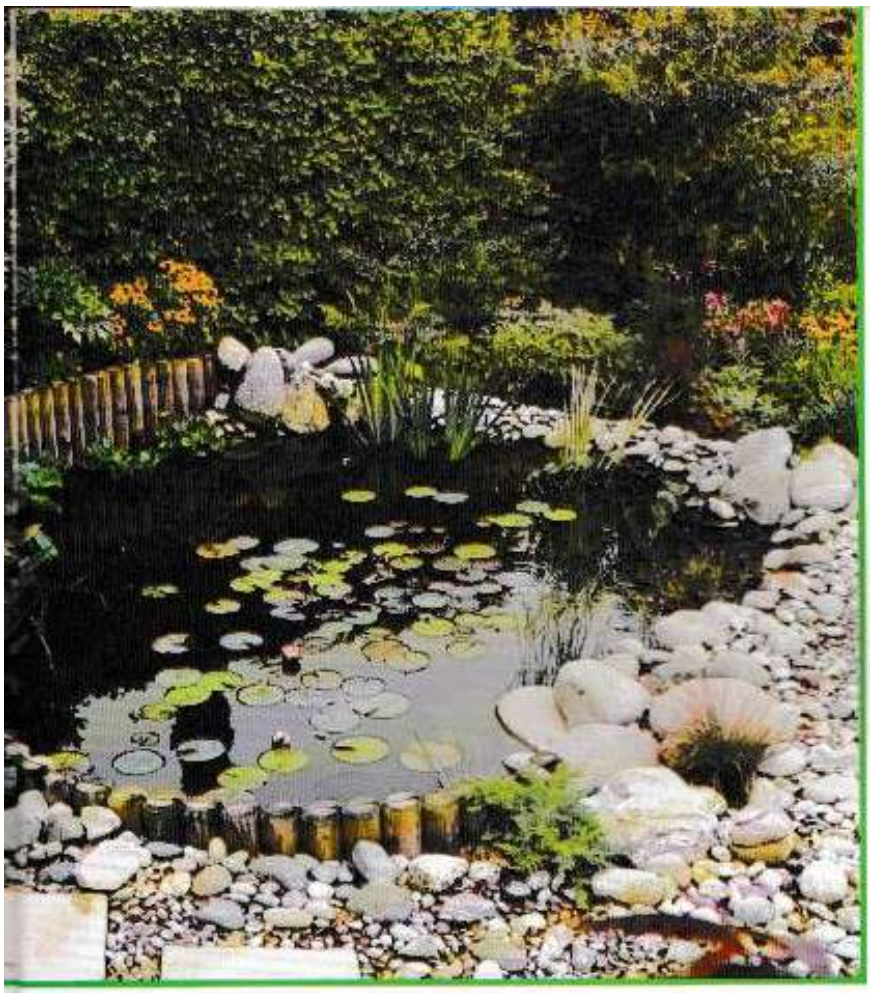
The size of liner needed for a particular pond can be calculated in the following way:

Add twice the maximum depth to both the length and width of the pond. For example for an 8ftx6ft pond, with a maximum depth of 2ft, the liner would be 8ft + (2ftx2ft) = 12ft long and 6ft + (2ftx2ft) = 10ft wide.

Construction of the pond can be undertaken at any time, but is best conducted during the Spring and early Summer. At this time of the year the ground will not be frozen or waterlogged, and once finished the pond plus its inhabitants will have time to become established before the rigours of Winter.

BUILDING A LINER POND

The construction of

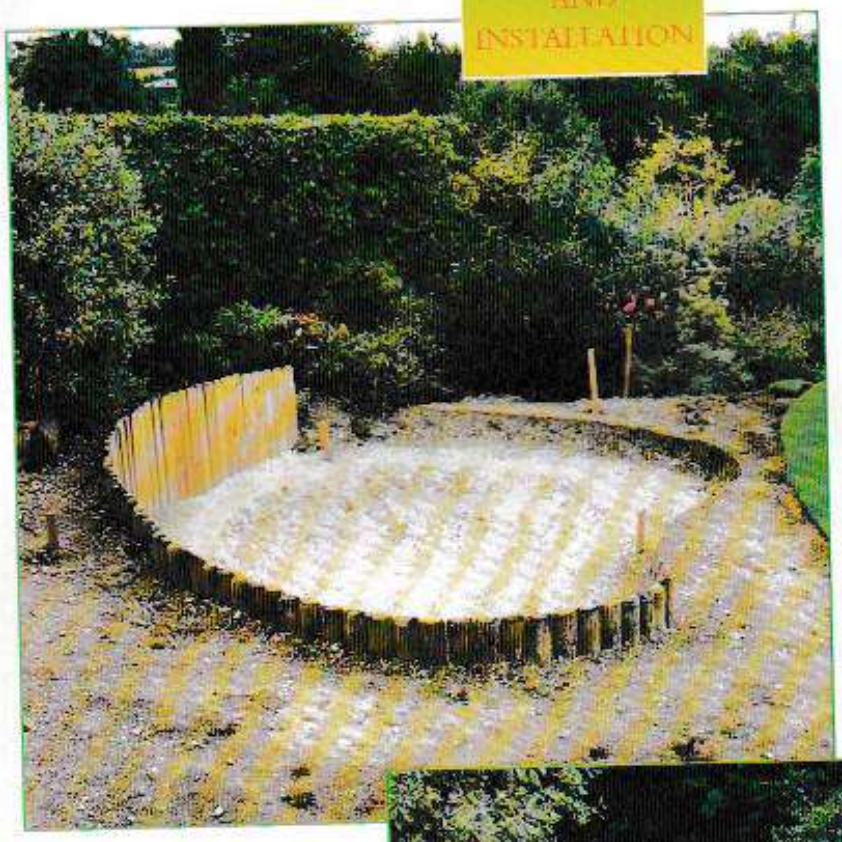


a liner pond can be divided into a number of stages, and these are shown in the following sequence of photographs:

Stage 1 — A hosepipe, rope or series of wooden pegs should be used to mark out the proposed shape of the pond. If the pond is on a lawn a useful tip is to use a hosepipe filled with water, as leaving it overnight will mark the lawn allowing you to remove the pegs, hosepipe, etc.

Stage 2 — The first stage of evacuation is to remove the soil down to a depth of 9in (23cm). Start digging in the middle and work outwards to avoid breaking the pond edges. Regular checks of the depth are necessary to ensure that you follow your plans. Undisturbed soil makes a much better foundation than an area that has been backfilled and firmed. Checks should be made using a spirit level to ensure that the top edge of the pond is level, as the final

POND DESIGN AND INSTALLATION



water level will immediately show any faults.

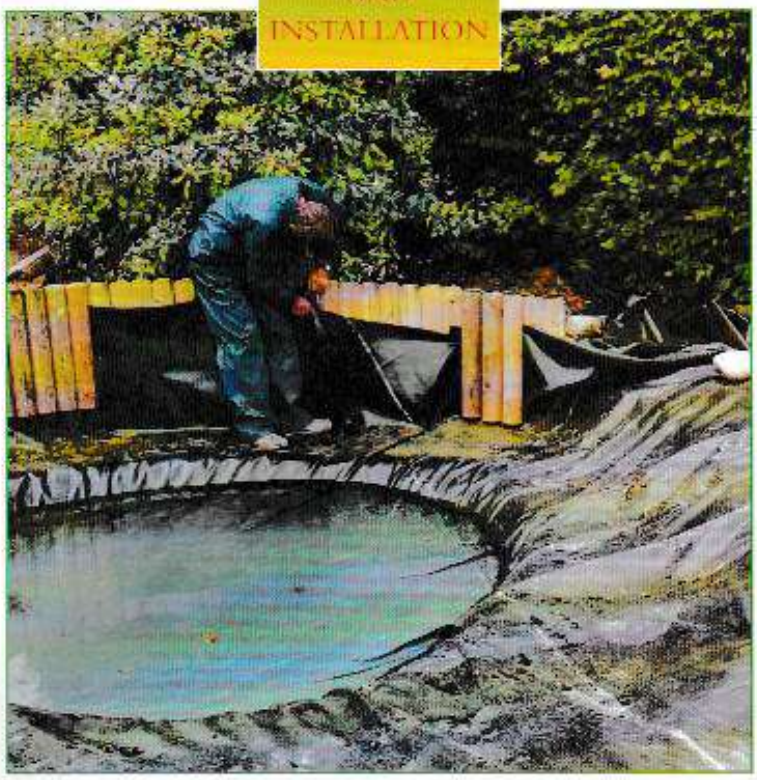
Stage 3 — Many ponds are built on a slight slope. Give some thought to the higher sides of the pond as a large expanse of butyl liner above the water level looks unsightly. Rain water can also flow off this higher ground and into the pond, so encouraging unsightly algae. We chose a log effect which held the liner in place as well as retaining the soil.

The next stage of excavation involves digging out the deepest area of the pond. Mark the position of the marginal and any other shelves using wooden pegs, rope or a hosepipe.

Stage 4 — Once the excavation is complete remove any sharp objects such as nails, twigs or stones that could puncture the liner. Where the pond is dug into chalk, or in a newly laid garden, complete with rubble, remove the worst items (such as flints, nails, etc). In bad areas it may be necessary to line the excavation with both a 2in layer of builder's sand and an under-liner. An under-liner is important even if the soil appears free of sharp objects as they can work their way to the surface as the excavation settles.

Stage 5 — The pond liner should be draped loosely into the excavation with an even overlap all around.

Remove your shoes and get into the middle of the pond to push the liner into position. Take care not to stand close to the edge of the shelves as the sand will fall away from the excavation. If possible undertake this stage during



bright weather as the sun will quickly warm the liner making it soft and easier to handle. Position a number of stones around the sides of the liner to hold it in position. As the pond fills with water the stones should be lifted to allow the liner to fit snugly into the excavation. Some creasing of the liner is inevitable, but this can be minimised by stretching and manipulating the liner as it fills.

To clean the liner fill the pond one tenth full and then drain. Knowing the volume of the pond will help when it comes to treating in the future. Hire a water flow-meter when filling the pond to get an accurate measure.

The full advantage of the two half logs at the back of the pond can now be seen. The liner is tacked to the half log already in position and then secured by attaching the second half log.

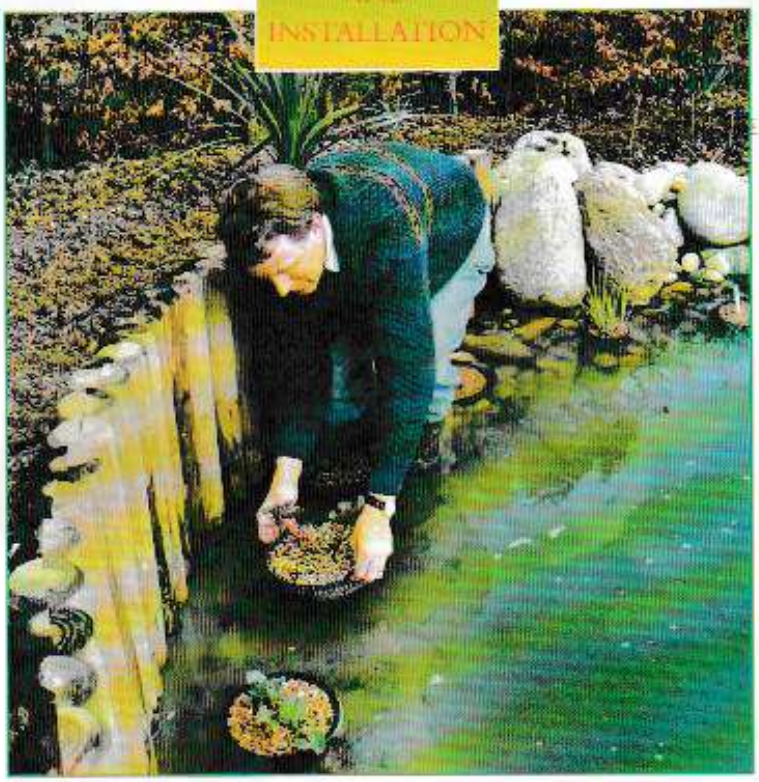
Stage 6 — When the pond is full the surplus lining can be cut off, leaving at least a 6in (15cm) flap around the side. This can be temporarily secured using nails to ensure that the liner does not slip. Ensure that the liner is cut off and secured above the level of the surrounding ground. This will prevent water draining into the pond from the surrounding garden, or water being syphoned out of the lawn by capillary action. Using a shallow draining ditch around the outside of the pond will also help to prevent water inflow (see right hand side of pond).

Stage 7 — Once filled the pond can be planted. Treat the water with a good quality water conditioner to remove any potentially dangerous chlorine. Select plants that are healthy and will not outgrow your pond. Allow one bunch of six strands of oxygenating plants to every two square feet

of water surface area to out-compete any algae.

Pot all plants to control their growth and allow easier maintenance. Fill the basket half full with special pond compost, and press down to remove air pockets. Place the plant in the basket so that the base of the growth buds are level with the top rim and add aquatic compost until it is within 1in of the top. Firm, and then add 1in of coarse gravel to stop fish digging.

Our pond was finished in mid March, and consequently there was little growth of the plants. Adding them at this stage in a good quality compost ensures that they will grow quickly as the weather improves.



POND SURROUNDS

Large pebbles, marginal plants and wood can give the pond a more informal appearance, whereas paving slabs and straight edges introduce formality.

Cement is often used in the construction of the pond surroundings to hold waterfall rocks in place or for pointing paving slabs. Take care whenever it is used as cement is very alkaline and will adversely affect the water, making it unsuitable for both fish and plants; treat it with one of the pond sealants to ensure it is insulated from the water. Where your pond is surrounded by paving stones aim to get them to slope away from the pond very slightly. In this way rain water will not wash debris and contaminants into the water.

MOVING WATER

Moving water is not just nice to look at, it is also essential to oxygenate the water and to power a pond filter.

Choose a pump that is big enough to do the job. The size of the pond is determined largely by the size of the pond, height to which the water must be pumped and to a lesser extent the type of fish being kept. As an approximate guide you should aim to pass the pond water through the filter once every 1-4 hours (every 1-2 hours in a fish-only, or heavily-stocked, pond).

If a waterfall is installed, the pump has to be more powerful to lift the water to its highest point. A pump capable of pumping 600 gallons per hour (g/ph) to a height of 3ft will only pump 530 gph to 5ft, 400gph to 7ft and only 145gph to 10ft. The quantity of water required for the waterfall depends on its width. As a guide 300 gallons per hour will give a thin sheet of water approximately 6in wide.

FILTERS

Installing a filter in the pond during construction is advisable. It will help to keep the water clear and pollutant free. External box filters are by far the most popular. They can (and should) be hidden, for example, under rocks or behind plants.

If a waterfall is being constructed the filter box can easily be hidden, and the outflow can run into the top of the falls. Your filter will need occasional cleaning so don't position it where it cannot be accessed.

CHOICE OF PLANTS

Carefully planting a garden pond will greatly improve its appearance, particularly if flowering species such as Water Lilies, Iris and Marsh Marigolds are added. However, the benefits of pond plants extend far beyond this. Plants with large or floating leaves provide shade and shelter for the fish, whilst, other species may be consumed or provide a spawning medium. During daylight hours they produce oxygen by photosynthesis, which can be important to the pond life, particularly on warm, still days. Very importantly, the plants also use up nutrients and absorb sunlight which would otherwise encourage unsightly growths of algae.

The numbers of plants that can be added to different sized baskets is as follows:

Basket Size (LxWxD) — 8x8x4in (20x20x10cm); Plants — 1 Pygmy Water Lily or 1 Marginal Plant or 4-6 Oxygenating Plants.

Basket Size — 10x10x6in (25x25x16cm); Plants — 1 small Water Lily or 2 Marginal Plants of the same species or 10-12 Oxygenating Plants.

Basket Size — 12x12x8in (30x30x20cm); Plants — 1 medium Water Lily, 2-3 Marginal Plants of the same species or 15-20 Oxygenating Plants.

One of the attractions of a pond is that it can be planted and landscaped to your own tastes. As a result no two ponds look the same. Don't let your imagination and choice be limited, a visit to a good water garden centre will reveal a wide range of different plants.

Don't limit your selection to ornamental species — plants such as Watercress can be grown in a pond or separate container to allow you to grow salad or soup material for the kitchen. Watercress must be grown in containers as it is very invasive and will spread around the pond if not controlled.

Watercress has other benefits for the pond: as it grows so quickly it will remove large amounts of nutrients which will prevent (or reduce) algae growth. Many Koi keepers have a separate 'vegetable filter' in which watercress is grown, which is away from the pond to stop the fish eating it!

FISH SELECTION

Goldfish in their many varieties are by far the most popular fish, being hardy, easy to care for and peaceful. Select the non-Fancy Varieties, ie, those without bulbous eyes, egg shaped bodies or fins missing, as they are more suited to aquarium life and would not survive the rigours of winter.

Add the fish to your pond gradually, over a period of several months. Adding 3-4 fish every week will allow the pond filter to cope with the increased quantities of fish waste and ensure that the water quality remains good.

The stocking level for the pond depends largely on the amount of water present. As a guide add 2-3in of fish length for every 1 square foot of water surface area. This allows the fish to grow once added to the pond. It is important that the stocking level is not exceeded. If too many fish are added to the pond problems may occur with the water becoming polluted, rapid spread of disease and unsightly green algae.

Feeding the fish is the main maintenance task, assuming you have taken care to ensure the pond is in good condition. Feed them on a good quality food twice a day — but only add as much as they will consume within 3-4 minutes.

FURTHER INFORMATION

There are a number of excellent books on pond keeping which are well worth acquiring. These include: 'The Practical Encyclopedia of Water Gardening', by James Alison, published by Salamander; 'A Hobbyist Guide to Successful Pondkeeping', by Dr David Pool, published by Tetra; 'Collins Field Guide to Freshwater Life', by R. Fitter and R. Manuel, published by Collins — an ideal book to identify what is in your pond.

A free Pond Information Pack is available by writing to: Your Garden Pond Pack, PO Box 1025, Nailsea, Bristol, BS19 2FX.

POND DESIGN AND INSTALLATION

Planting a Garden Pool

BARRY R. JAMES ADVANCES MANY REASONS FOR PLANTING THE GARDEN POOL

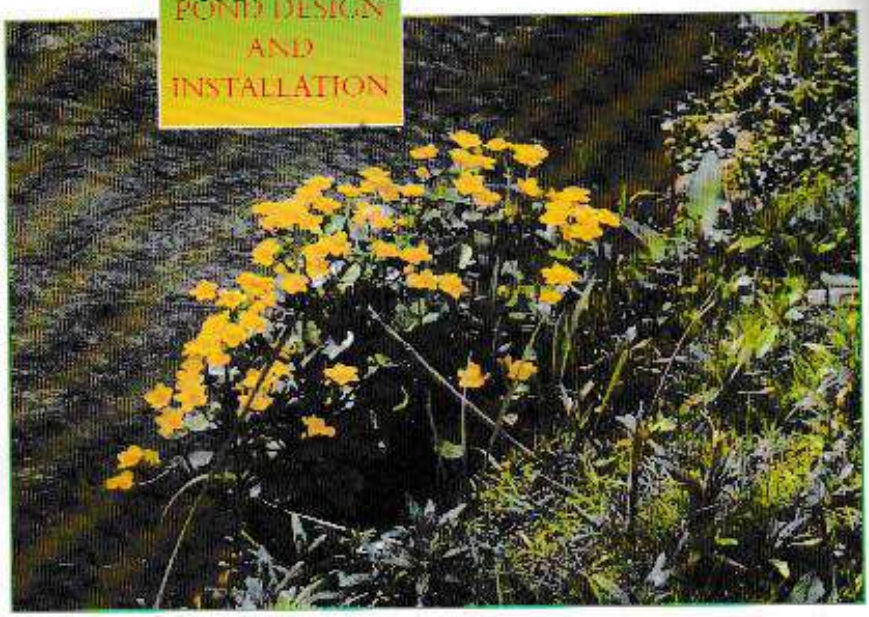
PHOTOGRAPHS BY THE AUTHOR

Euphorbia palustris

Without plants any garden pool will soon develop copious growths of filamentous algae (blanket weed) or the water will turn green (green water). The first line of defence against these organisms is to provide competition in the form of aquatic plants. Pond plants deprive these lower — in evolutionary terms — forms of life of the essential ingredients necessary for their existence. These are light, space and minerals. In addition, it is believed aquatic vegetation produce alleopathic chemicals which act like poisons inhibiting the growth of many forms of algae.

Apart from these considerations aquatic plants have enormous aesthetic value providing beautiful foliage and flowers throughout the warmer months. Unfortunately, in northern climes nearly all aquatic plants are herbaceous due to ice formation which can crush and freeze their delicate tissues. The pond, therefore, can look rather desolate in winter.

However, once the conditions improve growth is very rapid and some species produce their flowers in very early spring coinciding with the flowering of bulbous plants



Caltha palustris

such as Daffodils and alpines such as Aubretia. The pond area, therefore, contributes its share of colour at this time and various species continue to flower until the autumn frosts. Water lilies have a flowering period very similar to that of Roses which are generally considered to be in bloom longer than any other garden plant.

The majority of garden pools these days are artificial without a natural mud base. It is, therefore, necessary to place the plants in containers of compost. Special planting baskets in various sizes and shapes along with specialised composts are available from all aquatic outlets.

Natural ponds and streams naturally have varying depths of water varying from an inch or so on the banks to many feet in the deepest areas. There are also areas above the water level which can be waterlogged or simply damp. Different plant species have become adapted to these different ecological niches but, because of the instability of water levels depending on rainfall, are also capable of surviving for long periods when conditions change.

Marginal or Bog plants grow in the shallow water at the edge of the pool. Their roots are in the mud but the foliage and flowers are borne well clear of the water surface. Deep Marginals grow in slightly deeper water and their leaves and flowers generally float on the surface.

Floating plants have special buoyancy mechanisms which enable them to float on the surface with their roots dangling. They are at the mercy of wind and currents.

Oxygenators or submerged plants have delicate underwater foliage whilst their roots anchor them to the bottom. To plant a pool correctly there is a recognised density and variety of species which should be used in the initial set-up. If the planting is insufficient there might be failures because there aren't enough plants to provide competition to the algae growths which can proliferate and smother them. There are hundreds of species currently listed in Nurserymen's catalogues. My selection which follows are some of my own favourite species and varieties but of course is naturally limited by space.

MARGINAL PLANTS

These should be planted at the rate of one species for every 3ft of circumference.

Mentha aquatica is one of many species of mints which are native to our river banks. It is happiest growing in just a couple of inches of water where it will form dense strands of dark-green foliage. In early Spring the leaves take on a purplish tinge but later change to a paler shade, at which time the masses of pale-blue flowerheads are produced.

Myasotis scorpiodes, or Water-Forget-me-not, is another very pretty native aquatic. It has pale-green foliage and dainty blue flowers with yellow centres. There is also a pink variety. It grows in a similar way to Water Mint.

Euphorbia palustris is a fairly recent introduction and is a member of the Spurge Family. It generally

'Max' halves running costs for a pond filter pump

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

Just compare their performance:

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

OASE

For the name of your nearest stockist, call
OASE (UK) Ltd's Telephone Hotline
01264 333225

grows a couple of feet high with somewhat succulent foliage and bright-yellow flowers.

Caltha palustris has a number of folk names of which Marsh Marigold is the one most commonly in use today. The almost circular foliage and masses of golden-yellow blooms are produced in early Spring and add a brilliant touch of colour to wet places in our countryside.

Iris ensata (Syn: Iris kaempferi) is native to Japan but breeders have produced numerous colour strains of this species. Often called the Clematis-Flowered Iris because of the shape of the flowers; it has typical sword-shaped foliage, one variety of which is variegated in green and white longitudinal stripes.

DEEP MARGINALS

These grow in a similar manner to Water-lilies and some are closely related to them.

Nuphar japonica is one such species producing glossy, arrow-headed leaves which can grow submerged, on the surface, or are even capable of growing erect like a marginal when water levels are low or the plants are crowded. An imposing plant it produces pretty yellow flowers tinged with green and purple followed by strangely-shaped fruits.

Aponogeton distachyos, or Water Hawthorn, hails from South Africa. It grows in a few inches to 3ft of water and has long stems supporting oval glossy leaves and long white inflorescences.

The flowers are heavily scented.

WATER-LILIES

There are many varieties of Water-lilies which have been bred for colour, growing depth and size. It is important to select the correct variety to suit the dimensions of any particular pool. Allow one plant for every 15-25 square feet depending on the variety.

ABOVE
Mentha aquatica

BELOW
Iris ensata

Eilisiana has small, garnet-red flowers with orange-red stamens and green leaves.

Hollandia. A medium growing variety with double flowers very reminiscent of a Chrysanthemum. A beautiful shell-pink with orange stamens.

Mrs Richmond. Large deep-pink flowers and prolific green foliage.

Moorei. A medium grower with Lemon-yellow flowers and purple spotted foliage.

SUBMERGED AQUATICS (OXYGENATORS)

These plants are essential for every pool. They are normally sold in bunches, but some varieties are sold in small pots. Allow six bunches or one pot for every three square feet of surface area.

Lagarosyphon major (Elodea densa). Certainly the most ubiquitous species. It is reliable, fast-growing and hardy in most winters. The stout stem supports tightly incurved leaves which are dark-green in colour.

Egeria densa. The splendid foliage is a beautiful light-green sometimes tinged with bronze. The individual leaves have pointed tips. Unfortunately, this plant may perish in hard winters in exposed areas.

Myriophyllum verticillatum. A beautiful native aquatic which is becoming increasingly rare in many parts of the country. The fine hair-like foliage adds a graceful touch to any pool. Often remains green throughout the winter months.

Fontinalis antipyretica (Willow Moss). This pretty little aquatic moss is found in many of our streams and ponds. It forms graceful flowing masses in streams and tangled clumps in still water. Can even be established in artificial waterfalls. It is capable of surviving out of the water provided it is kept moist.

FLOATING PLANTS

The larger members of this group should be part of every pond. Some of the smaller species, however, can be invasive and cause problems. One plant or clump should be allowed for every 15 square feet of surface area.

Stratiotes aloides (The Water Soldier). This very succulent looking plant looks as if it would be more at home in a desert than in a pond. The rosettes resemble those of an agave and are dark-green ageing to reddish-green the whole plant reaching about a foot in diameter. The long white roots are anchored into the bottom mud. The small white flowers are produced in high summer. Propagation is by freely produced runners.

Eichornia crassipes (The Water Hyacinth). Probably the most popular floating aquatic but unfortunately this plant is not hardy and dies at the first sign of frost. However, if regarded as a summer bedding plant it is, with its bright-green glossy foliage and occasional bright-blue flowers, a most attractive aquatic. The bushy roots make a good medium in which Goldfish can lay their eggs.

ABOVE
Eilisiana.

BELOW
Myasotis.

POND DESIGN AND INSTALLATION

Koi or Goldfish Pond?

Top quality show Koi need specialist environments that ensure their long term healthy survival. Only this can justify the large amounts of hard earned cash that have been spent to obtain them.

BARRY GOODWIN LOOKS AT THE AVENUES TO CONSIDER BEFORE MAKING YOUR DECISION

PHOTOGRAPHS BY THE AUTHOR

Shall I keep Koi or shall I keep Goldfish? This is a question that many erstwhile pondkeepers may ask themselves when considering the construction of a new pond. Also they may perhaps wonder what the differences between the two types of fishkeeping are

— if, indeed, there really are any differences worthy of note.

To convince a novice, particularly one who has some fishkeeping experience, that Koi need different care to Goldfish is a very difficult task sometimes, but usually when the requirements are properly explained, then it becomes clear that there are indeed great differences in the environmental requirements between the two species.

Of course Goldfish and Koi are related to each other, but the more you study the subject the fewer these similarities seem to be and it is perhaps prudent to consult the table towards the end of this article to see some of the major differences between the environmental and nutritional requirements of the two types of fish, noting how these can affect the eventual care and attention we must give to them.

GOLDFISH

A Goldfish can normally be seen as quite happy within the confines of a smaller garden pond whose purpose is purely ornamental. This pond may also be seen by its owner as a 'wild life pond' incorporating a bog garden perhaps, and other small species of fish such as Comets and Shubunkins with the odd Frog or two and perhaps a population of Newts. Such a pond need only contain a couple of hundred gallons of water, and be serviced by a small, submersible pump together with a commercial box filter hidden away at the top of a waterfall.

Owing to the low production of organic waste, maintenance in such a system usually consists of a partial water change a couple of times a year, and cleaning of the filter as necessary to maintain a reasonable flow and clear water. There a are also a number of accessories available such as smaller UVs which are specially designed

ABOVE LEFT
A Hi-blo air pump.

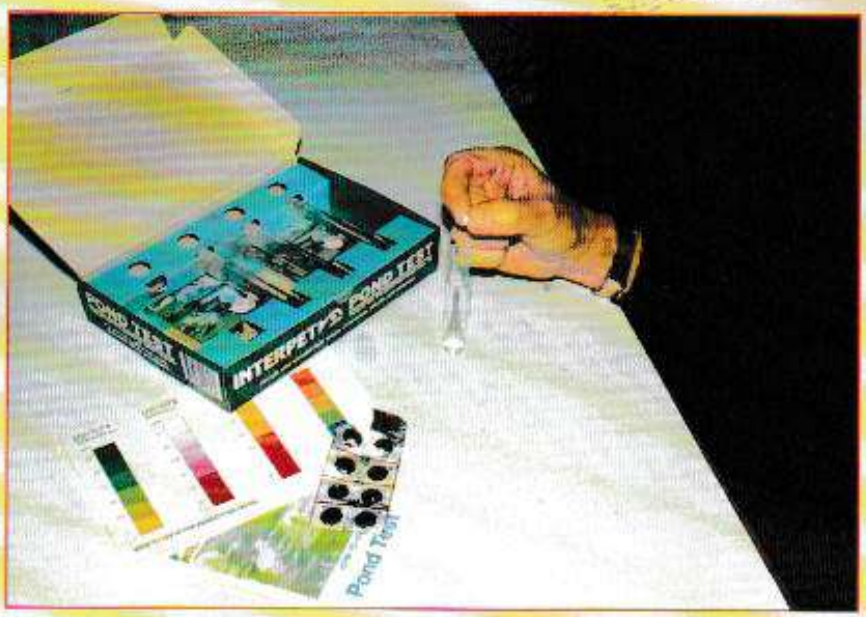
BELOW
Hoovering a Koi pond is very necessary to maintain the correct standards of hygiene at all times.

for the ornamental garden pond.

I must not forget to mention here that there are, of course, more dedicated specialist Goldfish keepers who do go to a lot more trouble than this, indeed some ponds belonging to these hobbyists come almost up to Koi standards, but such is not an absolute requirement for an ordinary garden pond such as we are considering.

KOI

However, when considering Koi, the first 'problem' that we can encounter is the eventual size these fish attain, as what looks very nice swimming around at 2½in in a dealer's tank can, within two or three years attain 20in plus and in a small pond without adequate life support systems it would suffer greatly.



Water testing is of paramount importance in a Koi pond.

Another 'problem' is the amount of waste matter created by Koi when comparing them to Goldfish and other small species of fish. Size for size the Koi produces several times the organic waste output of a Goldfish, and when you equate this to a Koi of around 28in in length, with a weight of maybe 15-20lb, you are talking about a lot of waste matter! Also Koi are naturally bottom feeders denoted by their barbels of which they have four. Because of this they continually grub around at the bottom of the pond, and if this is not kept properly clean through correct pond and filter design, together with regular vacuuming of the pond bottom being carried out, then water clarity and filtration efficiency can suffer.

Koi are also 'ammonotelic', which means that a large proportion of their nitrogenous waste is expelled into the water as ammonia, directly from their gills. This can cause the biggest problem of all in a new Koi pond and if the Koi keeper is not fully aware of the implications, and does not test the water regularly for ammonia, it can be responsible for the ill health and even the demise of his Koi.

WATER TESTING

I must reiterate, when keeping Koi it is important to test the pond water for ammonia at regular intervals and with a new setup, this will have to be on a daily basis. As stated previously, we can regard ammonia as the primary pollutant of pond water, but during the course of the nitrogen cycle within the filter, nitrite is produced. As this also is toxic to Koi we must have

Valley AQUATICS

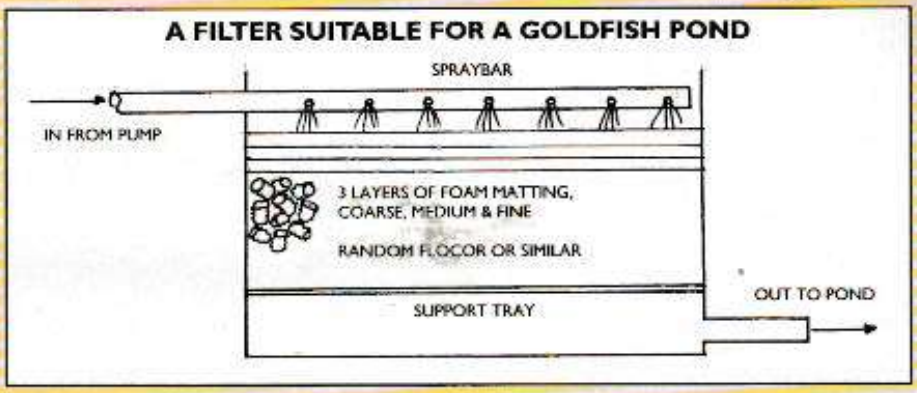
- We are the largest stockholders of JAPANESE KOI in the country
- Everything for the water-garden, liners, pumps, filteration systems, plants, etc
- Tropical, Marine and coldwater fish
- All accessories for indoor and outdoor tanks and ponds
- Helpful advice freely given

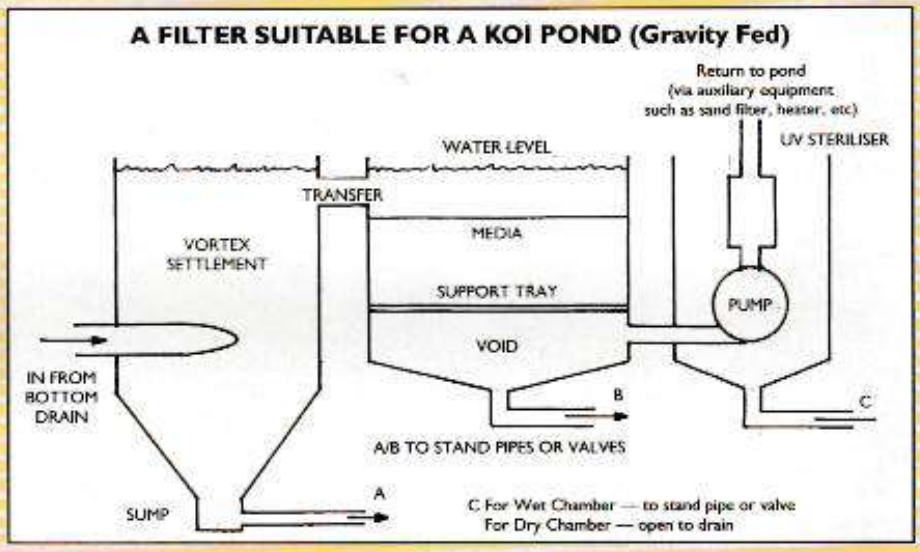
OASE

COME & SEE OUR DISPLAY AREA, WITH ITS 1800 GALLON GLASS AQUARIUM

Open 5 days a week 10am-6pm CLOSED TUESDAY & WEDNESDAY

BARRY AND LINDA PRICE
Plantation House (Carrs Ind Estate),
Flip Road, Haslingden, Lancashire BB4 5EJ
Telephone: Rossendale (01706 228960/224370





the relevant kit to hand for testing this.

There is another important parameter and this is pH, which indicates the alkalinity or acidity of the pond. It will indicate to you whether or not the filter is performing satisfactorily, as a low pH would tend to indicate a blocked and tracking filter producing acid conditions, a low oxygen level, or a high CO^2 level. A high pH would indicate an immature filter, or even a pollutant in the water such as alkalines leaching from cements and other building materials. An ideal pH to maintain is between pH 7.5 to pH 8.3 at which your Koi will thrive, but under adverse conditions pH 7.0 to pH 8.5 is acceptable. A high pH, possibly as high as pH 9.0, can be expected when maturing a new filter, during which time pollutants are controlled by partial water changing.

TAP WATER

Another factor comes into play here and this is the quality of tap water, for whereas a Goldfish seems not to be bothered by the vagaries of this commodity Koi are rather sensitive to it and measures must be taken to remove chlorines, chloramines, and heavy metals. These will not only have an effect on your Koi, but on the efficiency with which your filter works. Most Koi keepers use a water purifier for this, in fact they are readily advertised in *A&P*.

FILTRATION

The amount of filtration required is perhaps the major difference between Goldfish and Koi keeping.

For Koi the filtration systems must be designed to correctly separate the solid matter from the water in a manner where it can be

easily flushed away, and the biological stage of the filter that is designed to oxidise the ammonia is much more sophisticated in design than anything that would ever be envisaged for a Goldfish pond. It is perhaps, unfortunate, that we should call such a system a 'filter', as this conjures up a vision of a mechanical unit, separating particles from the water, which is the last thing that we should be asking a biological unit to do. Perhaps the description 'biological unit' would be a better name that we should all adopt when describing a filter.

When considering a filtration system for a Goldfish pond it is more usual to combine mechanical filtration by sponges in a box filter with biological filtration using plastic media in the same unit, such filter being supplied with water from a submersible pump in the pond. This would be impractical for Koi, as I am sure that many of you who have tried it will agree, as the sheer volume of waste matter would mean that the maintenance workload was far too high and this vital task may, as a result, eventually be neglected.

In a Koi pond filter the solid waste is usually separated from the water by some form of settlement being either a gravity chamber or a dynamic vortex before the biological filtration stage. The biological stage then does just that — it oxidises the residual ammonia firstly to nitrite, and then to the less harmful nitrate. The presence of solid waste in the water at this point would inhibit the efficient working of the oxidation process.

Such systems are normally gravity fed with the pump at the end of the system, returning the water to the pond.

This prevents the waste matter from being liquidised before settlement, as it would be if the pump was a submersible unit in the pond. Liquidised waste matter can't be settled from the water, and it is a major cause of poor water clarity in many ponds.

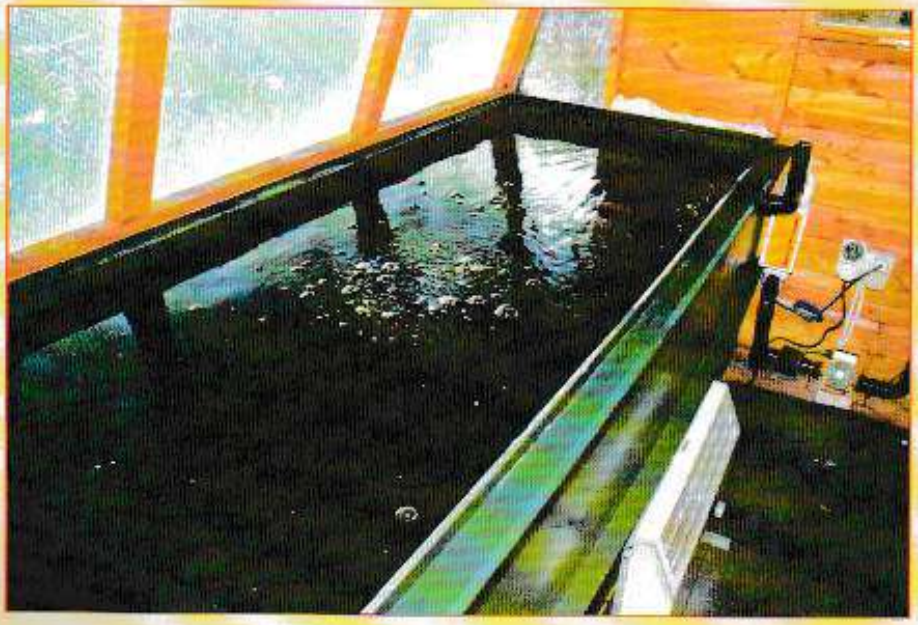
Again, because of the large proportion of solid faecal matter and liquid ammonia produced by Koi, large filtration systems are the order of the day, and a very old rule of thumb states that it should be between $^1/_2$ and $^1/_3$ of the pond size. Many hi-tech filtration systems are now available, and although it is stated that by using such a system not as large a filter is required, you will find many Koi keepers still erring on the side of caution, and fitting a bigger system than is recommended. This is, for many reasons, not the least of which is that a bigger filter with an evenly distributed biomass will ways stand up better in the face of pond medications than a smaller unit. It is also true to say that you can never have too much filtration, but your Koi can always suffer from too little.

A typical Goldfish pond filter would look something like that seen in diagram 'A', while a Koi unit would conform more with diagram 'B'.

REMEDIES

In general there are many commercial remedies 'off the shelf' that are designed with the treatment of various parasites and bacterial infections in mind, and while most of these prove efficacious within the confines of a Goldfish pond they sometimes leave a lot to be desired when treating a Koi pond where larger and more aggressive parasites, together with imported diseases, are sometimes found. Price is also a major factor when considering treating a Koi pond for, despite rumours to the contrary, these days Koi keepers do not all belong to the wealthy elite!

Quarantine is a very necessary precaution to prevent new arrivals spreading parasites and disease to the rest of your Koi.



POND DESIGN AND INSTALLATION

Ponds such as these have been designed specifically to support Koi and have design features that would be extravagance in the extreme for a hobbyist wishing to keep only Goldfish.

ABOVE A specialist environment with specialist tools. No other words could describe the health treatment facility that this Koi keeper has laid on for his charges

BELOW Big ponds need big filters. This filter, which incorporates a vegetable filter, is 100 square and half the size of the pond that it supports.

Whereas a Goldfish pond may cost a fiver to treat, a Koi pond could cost up to ten times that amount because of its greater quantity of water. Koi keepers, therefore, tend to rely on less expensive but nonetheless very effective remedies such as formalin and malachite green to deal with parasitic outbreaks. Usually though, the Koi keeper relies on maintaining hygiene within the pond and filter system to give him the sort of water quality that will ensure good health and immunity to parasitic outbreaks. To assist in this it is also necessary to quarantine new purchases of Koi in order that disease and parasites are not spread to the other fish in the collection. This means that a quarantine system must also be established, and sustained with a maintenance crew of fish. (These can actually be Goldfish!)

You can now see as this discussion progresses the gulf between the Goldfish pond and the Koi pond becomes ever wider.

THE LEARNING CURVE

The acquired learning mentioned in this article is a very important thing and you will need to 'gen up' on

▶ Continued on page 66

the requirements of your Koi, learning how to treat them when they are injured or sick, including the use of anaesthetics and sometimes prescribed drugs. You will learn when to feed them, when not to feed them, and which protein levels to feed at different temperatures. These considerations, together with a host of other things that you will undoubtedly have to learn, could make you feel as if you are studying for an Open University course! Unfortunately, without this specialist knowledge, which you didn't really need to keep your Goldfish, you will run into many difficulties with the Koi keeping hobby.

The learning curve doesn't flatten out with health, as you also need to become an amateur water scientist, learning a lot about the water parameters that need to be maintained to the highest order. You also need to become 'Koi-wise' when making purchases of equipment, ensuring that nothing you purchase for use in your pond will introduce toxins into the water which will in turn harm your Koi. Koi are undoubtedly a long-term commitment, similar in many ways to that which is made when purchasing a dog or cat, and they invariably seem to run away with a lot more money than you first intended to spend — but that's Koi keeping folks!

COMPARISONS

Let's now look at Goldfish/Koi comparisons in an easy to understand way

GOLDFISH	KOI
Are quite hardy.	Are susceptible to poor water conditions. It seems that the better quality Koi are affected more here, possibly due to some inbreeding.
Do not need a large pond.	You need plenty of water (1,500 gallons +) in a larger pond incorporating: Bottom drains; A depth of at least 4ft; A good water flow; Good aeration. This sort of pond can be expensive to build and maintain.
Do not need a sophisticated filter system.	You need a good filter system incorporating: Settlement area; Biological area of between 1/3 and 1/2 of the pond size with a water turnover rate of once every two hours; Pumping stage comprising a high performance pump, UV steriliser, anti blanket weed device, etc.
Will respond readily to 'off the shelf' remedies.	Sometimes requires specialist remedies, including anaesthetic, which can be difficult to get hold of. A certain amount of knowledge and acquired skill in treatment techniques is necessary.
Do not need specialist foods.	You do need specialist foods containing: The correct balance of nutrients and vitamins; The correct protein level; Colour enhancer. These foods are in many cases expensive, between £12 and £20+ per 2.5kg bag. A medium sized Koi collection can eat up to 5kg of food in a week at peak feeding time, which as you can see, can cost you up to around £40+.
Will live happily with plants. Smaller in size.	Will eat plants in the pond. Larger in size. Can grow to 28in or more in the UK, and specimens of over 1m have been grown in Japan.
Are inexpensive.	Are more expensive, especially if Koi of show quality are considered when four figure sums are not uncommon.

How 'Max' takes the pressure off handling polluted water

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

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

OASE

For the name of your nearest stockist, call
OASE (UK) Ltd's Telephone Hotline
01264 333225

POND DESIGN AND INSTALLATION

The Not-So-Common Frog

LYNDA OSBORNE ADVISES ON CARING FOR THIS WELCOME VISITOR TO THE POND

PHOTOGRAPHS BY THE AUTHOR

After we have spent the winter indoors, with the pond outside as quiet as a shopping mall after hours, the arrival of the frog at the water's edge is a welcome sign that Spring is coming and our pond is about to wake up and become full of interest again.

When you see the frogs pairing up ready for breeding, be glad that you still have some of these visitors, for frogs are not as common as they once were. All over the world frogs and toads have been disappearing. There are many possible explanations for the decline in frogs, such

as: polluted rivers, acid rain, a thinner ozone layer (meaning harmful radiation gets through), wetlands drying up due to an increased demand for water, insecticide in the insects they eat, and even a new virus affecting frogs. Also, it has been estimated that in Britain alone, 9,000 ponds are filled-in each year.

Therefore, gardens with ponds have become important habitats for frogs. So if you have a pond in your garden, it is good to encourage the presence of these creatures, and the development of spawn to tadpole, then tadpole to frog, is fascinating to watch.

After some croaking and splashing about in your pond, there will hopefully be some clusters of frog-spawn. Only a few hours later, the embryo starts to grow and gradually changes from its circular form into a tadpole shape, and two and a half weeks later, it wriggles itself free from the rotting jelly. It is at this stage in particular that Goldfish, Newts, and even Pond Snails, find tadpoles a delicacy and they will pick many of them off the spawn, as they are getting ready to leave.

Babysitting the spawn.

For the next eight weeks the tadpoles swim around looking for something to eat, and they grow bigger and bigger. Algae and single-celled animals (protozoa) are their main foods, but they will eat 'meat' if they find it. A piece of bread in the pond is quickly surrounded by tadpoles — the bread floats around like a raft, with tadpoles clinging on all sides by their sucking mouths. Tadpoles are now a tasty morsel for many other creatures, including Great Diving Beetles and Dragonfly Nymphs.

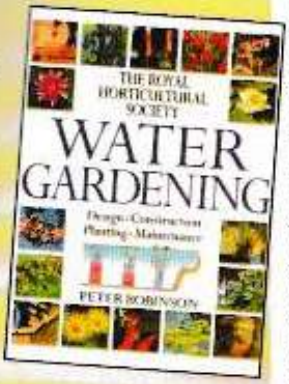
For the tadpoles that manage to dodge predators' hungry mouths another transformation begins to take place. Back legs develop and then front legs, and the tail starts to be reabsorbed. About 12 weeks after the spawn was laid tadpoles begin to look like miniature frogs and will venture out of the pond on to dry land. You can often see birds near the pond at this time, eating up the little froglets around the water's edge. The froglets must wonder if life is ever going to feel safe, it seems like every creature wants to eat them. It has been estimated that out of every 2,000 eggs laid by a frog only about five will survive to become adult frogs — this must be one of the worst life insurance risks! The froglets hide under plants around the pond edge, eating tiny insects, until rain creates damp conditions, and then they hop off into the world. It takes two years for them to grow up into adult frogs and then they come back to the pond to breed.

Frogs are good for your garden, because as well as eating insects, a quarter of their diet consists of slugs and snails. What can we do to encourage these creatures, who not only have a hard time growing up because there are so many predators, but are also now threatened with dangers caused by man?

Make sure your pond has lots of plants (marginal and aquatic) so that the tadpoles have somewhere to hide from predators. Try to keep the pond's snail population down as they can account for the loss of some tadpoles — I've even seen one eating a young Goldfish. Feed the tadpoles with fish food and bread to help them to grow quickly. Have plants and long grass around the edge of the pond to give froglets cover when they venture out, but keep your grass mowed regularly elsewhere so they don't hide in the lawn and get caught by the lawnmower. If your garden is completely surrounded by a fence or wall make sure there are small holes at ground level to allow free access. Be careful with insecticide, as a frog's diet consists of many different insects.

Although it can be very disheartening to see your plants and seedlings eaten by slugs and snails, avoid using slug pellets unless the manufacturer assures you on the packet that they are harmless to wildlife. Birds and Hedgehogs, as well as frogs, may eat the poisoned slugs and snails and become unexpected victims. If these

RHS WATER GARDENING BOOK SPECIAL OFFER TO A&P READERS



Under an exclusive arrangement with Dorling Kindersley, the publishers of the RHS book 'Water Gardening' readers of A&P can obtain copies of this wonderful book at a Special Price of £20 per copy. This price includes a discount of £5 on the ordinary publisher's price of the book and also includes free postage and packing.

TO OBTAIN YOUR BOOK

Readers should call the Special Hotline Number 01442 881880, quoting Reference Number 221307 giving their Credit Card details and quantity of books required at £20 per copy including delivery. Alternatively, payment can be made by cheque. Readers wishing to pay in this manner should complete the following coupon:

Please send me ..... copies of the RHS BOOK OF WATER GARDENING at £20 per copy including delivery. Please make cheques payable to Dorling Kindersley Ltd.

NAME .....

ADDRESS .....

.....

.....

POSTCODE ..... TEL .....

Reference Number 221307
OFFER CLOSES 30 MAY 1997

Send completed coupon to:

IBD CUSTOMER SERVICES, CAMPUS 400, MAYLANDS AVENUE, HEMEL HEMPSTEAD, HERTS HP2 7EZ

BOOK REVIEW

Water Gardening

Author: **Peter Robinson**

Publisher: **Dorling Kindersley**
Price: **£25.00 (see special *A&P Reader's Offer*)**
ISBN: **0 7513 0304 6**

With the still rapidly increasing interest in water gardens, coupled with the increasing number of water-gardening equipment outlets at garden centres, it comes as no surprise that the top name in gardening circles — The Royal Horticultural Society — should become associated with a book on the subject. Add to this the production facilities of a renowned publisher, Dorling Kindersley, the expertise of a long-established authority on the subject and you should have the makings of a high quality, best-seller on your hands.

RHS WATER GARDENING is written by Peter Robinson, now a freelance horticulturist and water gardener designer but for many years Principal of the Capel Manor Horticultural College for North London. Readers may remember that around this time last year he was co-author of 'Water Gardening, Lilies and Lotuses' (reviewed *A&P*, July 1996). With such a background of experience the reader can expect a wealth of information and you won't be disappointed.

The work is divided into four parts — Water Garden Design, Creating Water Features, Stocking and Maintenance, Plant Catalogue — and each section is divided into relevant sub-sections. The first section is composed to a common format for each of the nine designs; a photograph of the finished design is accompanied by a plan of how it fits into the existing garden and has a short descriptive text: next comes another comprehensive plan of the water garden part only showing in detail the planting layout and listing species featured. Designs include Raised Double Pool, Large Formal Pool, Container Gardens, Oriental-style Water Garden, Courtyard Pool, Informal Pond for a Town Garden, Millstone Fountain, Wildlife Pond with Bog Garden, Stream for Town or Country Garden.

Choosing a Water Feature is a thorough, not to be rushed, business and a very useful Check Table is suggested. The encouragement of Wildlife is also discussed as is the correct siting for the pond: Excavation, Measurements, Construction Tools and Materials and Construction Techniques.

Being a water gardening title, although filtration is explained quite adequately, systems described are limited to small external and in-pond filters — large Koi-pond, in-ground filters are not covered.

Both Features with Still Water and Moving Water are fully described; excellent artwork and photographs show exactly how each design is put together regardless of materials chosen — liners, concrete, clay are all included. Once the basic pond is installed, a further sub-section provides the finishing touches such as stepping stones, bridges, lighting, edging and timber decking.

Maintaining a Healthy Pond describes everything you need to know — what to do, when to do it throughout the year. Preparation for plants and their continuing culture is given a relatively large section and, for a 'gardening' book, fish are not neglected either with good coverage of both species and care, including diseases.

The last section, the Plant Catalogue, is probably where the reader will spend most time (once the planning and installation parts have been utilised); here you will find exactly the right plant for the right place in your water garden whether it be for underwater, alongside or in a bog garden.

Particularly pleasing was the separate Plant Index which provided 'thumbnail' descriptions of each species and its use in addition to the merely expected page number.

Dorling Kindersley's team have produced a sumptuous book which will appeal to everyone who finds water in the garden attractive — whether a pond, stream or a patio-situated, self-contained feature. One should not be surprised if the book becomes a 'sell-out' at the Chelsea and Hampton Court Palace Flower Shows — it deserves to be.

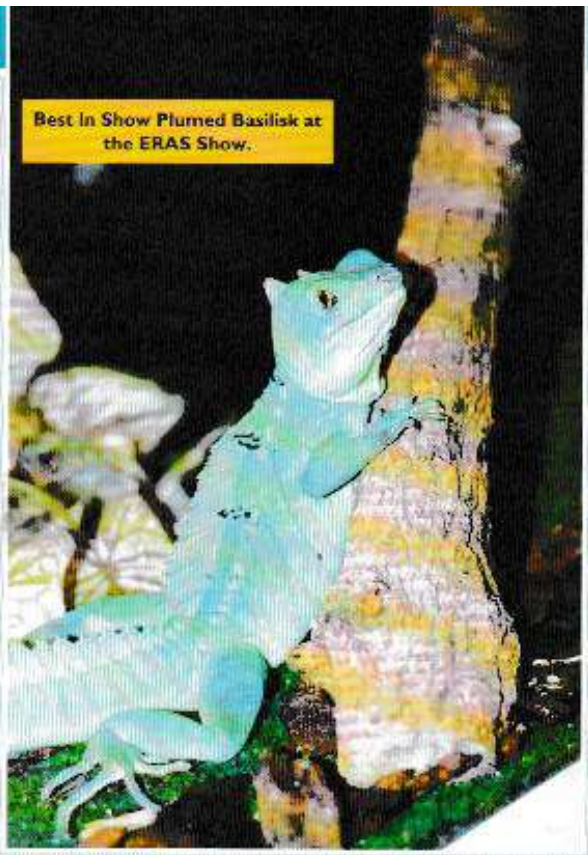
DICK MILLS

secret to Spider specialists up and down the country. So if you want to know if it's a male Spider or a female Spider sharing your bath, just contact them and they'll put you right!

Fishkeepers weren't forgotten entirely — there was a small but attractive set-up mounted by the Southend, Leigh and District Aquarist Society. Traders amongst the Society stalls dealt in everything reptile and amphibian, from purpose-built vivaria, heat-rocks, UV lights, snake-hooks and vitamin supplements to T-shirts, badges, 'I love frogs' stickers and harnesses to enable you to take your pet Lizard for 'walkies' (True!)

Last, but by no means least, the large stand run by the host Club, the Essex Reptile and Amphibian Society, was a delight: a paradise of beautiful herptiles all bursting with good health. The creatures included Plumed Basilisks, Bearded Dragons, Horned Frogs, Blue tongued Skinks and Savanna Bosc Monitors. An admiring crowd relished the spectacle of those perfect specimens, while the perfect specimens themselves posed haughtily, superciliously gazing down their arrogant noses as they accepted the visitors' homage. Peter Clark, the chairman, presided over the display, and the Association should be congratulated on putting together such an excellent Show.

Carol, still on the door when I left, said: 'I love Frogs. Each time I find one in my garden, I kiss it — one day one might turn into a prince'. Good for you, Carol. You never know — just keep on trying!



Best In Show Plumed Basilisk at the ERAS Show.

GREAT A&P £350 ARCADIA LIGHTING COMPETITION

Now, this fantastic lamp has been incorporated into a brand new sophisticatedly-designed 50cm Professional Pendant and you could win one of these lighting units just by answering a few simple questions.

The Pendant (worth £220) not only incorporates the wonderful lamp (worth £69.95) but also has many innovative design features:

★ **The special reflector ensures that the maximum possible amount of light is usefully reflected into the aquarium where it is needed most.**

★ **Special side-panels prevent unwanted light spillage and glare to the viewer.**

★ **Lamp replacement is easy.**

★ **Lamp-protection glass cuts out harmful UV rays as well as guarding against water splashes.**

★ **Lifting or pulling down on the canopy instantly positions for use or maintenance.**

★ **It's easy even with the built-in control gear.**

Send your answers on a postcard (or sealed down envelope) with your name, address and telephone number to: ARCADIA PENDANT COMPETITION, JERRARD BROS, CAIRO NEW ROAD, CROYDON SURREY CRO 1XP to arrive no later than 30 May 1997.

The first correct entry to be drawn will receive the Arcadia Professional Pendant fitted with 150W, double-ended, Metal-Halide 10,000K lamp.

Two runners-up will receive a Replacement 150W double-ended, Metal-Halide Lamp (please specify 10,000K for marine aquariums or 4,300K lamp for freshwater aquarium).

The Questions

1. *Name the green compound found in many invertebrates which requires intense light to survive.*
2. *What is the colour temperature of the new Arcadia lamp?*
3. *Where is the control gear situated?*

Readers of Buy Lines in January's issue of A&P will recall the new 150 watt double-ended, metal-halide lamp from Arcadia with the very high light output of 10,000 lumens — an intensity ideal for marine aquariums whose invertebrate inhabitants often depend on such light for their continuing chlorophyll-supporting existence. The lamp's colour temperature of 10,000 degrees Kelvin replicates that of light in the shallow waters of the natural coral reef enabling you to see your fish just as they would appear in nature — without the expense of a long-haul flight.

FROGS & Friends

By BOB and VAL DAVIES

HERP FACT FILE

Underwater respiration

Spectacled Caiman. Note the flap which closes off the throat.

PHOTO: BOB & VAL DAVIES

Reptiles and amphibians which live wholly or partly in water are faced with the problem of oxygen supply when submerged. When in the water Newts and Salamanders use three methods: through the skin, the mouth lining or lungs. Using the latter means rising to the surface to gulp air which renders them vulnerable to predation. In warm water with a low oxygen content this method is used more frequently. Underwater, many species can be seen sucking in and expelling water to extract oxygen using the mouth lining.

The largest family, the Lungless Salamanders (Plethodontidae) breathe only through the skin and mouth lining. Retention of external feathery larval gills by totally aquatic forms, such as the Axolotl, permit respiration. The Amphiuma (*Amphiuma means*) has lungs but retains a larval gill slit.

Some Lungless Salamanders inhabit cool, fast-flowing streams where oxygen is abundant or, if terrestrial, moist areas. Similar habitats are used by the Japanese Giant Salamander (*Annas japonicus*) and the American Hellbender (*Cryptobranchus alleganiensis*) both of which have a fold of skin along the flanks to increase the surface area. Both can also breathe normally at the surface. In certain Newts, which enter the water in Spring, the skin becomes thinner and more permeable to oxygen.

Frogs and Toads have developed a similar variety of methods which differ according to their habitat. To varying degrees, according to species, the skin is permeable, mainly on the underside, and water (with oxygen) can be absorbed by sitting in the moisture. Clawed Toads (*Xenopus*) inhabit oxygen-poor water, have large lungs and frequently gulp at the surface. Certain species have increased the body surface area, with resultant increased oxygen absorption, by developing a loose, baggy skin as in the Lake Titicaca frog (*Telmatobius culeus*) or 'fringes of skin' as in the Hairy Frog (*Trichobatrachus robustus*).

Aquatic and semi-aquatic Turtles use lungs but can also respire through the skin, throat lining and thin-walled sacs inside the cloaca. Use of these auxiliary methods varies with species, some do not possess the cloacal sacs and underwater respiration is mainly via the skin and throat lining. Others use a combination of methods to stay submerged for extended periods. Loggerhead Musk Turtles (*Sternothorus minor*) and Fitzroy's Turtle (*Rheodytes eukops*) can stay submerged almost indefinitely, surfacing only rarely.

Crocodilians depend on their voluminous lungs. When submerged, the nostrils close and a wide flap of skin shuts off the throat, allowing feeding without the lungs flooding. In cool conditions crocodilians sleep under water but reduced metabolism means that oxygen is not absorbed by much of the body tissue. They will, however, surface to breathe if the heart and brain are not receiving enough oxygen.

Warning — a cosy home for rodents

When lining half of the garage for hibernating reptiles we decided to use chipboard with a layer of fibreglass wool behind it. Fibreglass is usually described as 'vermin-proof' — presumably this means that mice will not take up residence in it because of its irritant quality. However, a large pile of the fibreglass was seen in one corner. A female mouse had found a small gap and had excavated a nest behind the chipboard. Setting traps resulted in the capture of several young mice, obviously her family.

Besides fouling the place mice could conceivably damage hibernating creatures — they had also eaten our mealworm supply which is kept cold in the garage, the heads had been neatly nipped off and the contents sucked out.

In another incident a friend had insulated his reptile house with hardboard and styrofoam slabs. It became apparent that the styrofoam was home to numerous rodents (mice and voles). Having removed the hardboard it resembled the London Underground — dozens of interconnecting tunnels, nesting chambers and substantial numbers of the inhabitants dashing about like commuters in the rush-hour!

Conservation matter

At various times we have mentioned the international concern over disappearing species, especially amphibians. Australian scientists report that 10 species of frogs have become extinct and another 34 species are now endangered. The exact cause is unknown but a virus is suspected.

Captive-breeding of some of these species has not been very successful especially in the case of the Sharp-snouted Frog (*Taudactylus acutirostris*). One proposed measure is in-vitro fertilisation; a technique which was first developed with amphibians. It is hoped that frogs treated with hormones will produce sperm and eggs which could then be mixed. Deep freezing of eggs, sperms and embryos could provide a bank of genetic material to be used when necessary.

A study in Jersey (reported in the 'Natterjack' newsletter) has

Recent imports

In recent years Mantella Frogs have been popular vivarium subjects. More recently a few specimens of the genus *Heterixalus* have appeared in the Trade. As far as we know, these seem to be the first.

They are colourful, small to medium-sized (22mm-40mm) Tree Frogs. Their native habitat is shrubland, they breed in open pools, swamps and ricefields. At present we are working with two of the 10 known species.

Heterixalus madagascariensis, at 40mm, is one of the largest species. When at rest in the day the colouration varies, according to light and temperature, from pure white, pale lemon yellow to light powder blue. At night when active they are light brown. The thighs, ventral surface of limbs, hands and feet are pale orange.

H. alboguttatus is slightly smaller. During the day the back varies from dark brown to cream. In the evening and night the back becomes black with orange/yellow spots. As with the previous species thighs, hands and feet are orange.

Each species is maintained in a tropical rainforest vivarium. Cork slabs line the back and sides; substrate consists of several layers — at the bottom large gravel, filter carton, potting soil with a final layer of small gravel which is topped with moss. Plants comprise Creeping Fig, Devil's Ivy, Sweetheart Vine and Spathiphyllum. There is also a water section at the front. The vivaria are sited in a warm reptile room so additional heat is not needed although each is fitted with a UVB fluorescent tube to provide some light. The vivaria are sprayed daily. Food consists of winged, Flightless Fruit Flies and small Crickets. *H. alboguttatus* has recently started calling during the night. Little is known about their breeding habits.

Heterixalus alboguttatus showing nocturnal colouration. PHOTO: BOB & VAL DAVIES

Tortoise slaughter

This sad story appeared as a special bulletin from the Tortoise Trust in the Reptilian magazine (February 1997) with a request that as many people as possible should publish it.

A consignment of 1,000 Horsfield's Tortoises (*Agrionemys horsfieldi*) were flown into Sweden.

Lacking the necessary import permits they were impounded by the Swedish authorities and placed in a large shed without heat, food or water. They were hosed down daily with cold water (in a Swedish winter!). News was leaked to the Tortoise Trust who alerted the Swedish media and numerous bodies worldwide. The Trust offered to pay for their flight back to Tadjikstan. SAS Airlines made a similar offer and the Swedish authorities were bombarded with requests from all over the world to save these unfortunate animals. A week later all the Tortoises were dead, deliberately frozen by Ministry of Agriculture officials who claimed that all were 'too sick' to save. An official on TV attempted to blame 'CITES regulations' for the slaughter.

According to reports illegal animals of all kinds are routinely destroyed in Sweden as an example to illegal importers. The Trust is organising a campaign to publicise the affair via an Internet WWW site, a boycott of Swedish goods and services as well as a massive petition via the EC. A tragic end indeed. In an 'enlightened' country which frequently lectures on human rights.

Further details from The Tortoise Trust, on 100105,555@Compuserve.com or The Tortoise Trust, BM Tortoise, London WC1N 3XX.

The victims, Horsfield's Tortoise. PHOTO: BOB & VAL DAVIES

shown that the Agile Frog (*Rana dalmatina*) has seriously declined in recent years. Again, the exact cause has yet to be ascertained — a combination of several factors is thought to be responsible. The Common Toad (*Bufo bufo*) is also experiencing difficulties in the wild although breeding in garden ponds. Jersey's third amphibian, the Palmate Newt (*Triturus helveticus*) is apparently doing well. Why this is not affected by the same factors is not clear. A captive-breeding programme for the Agile Frog is in operation and is reported to be having some success — the apparent difference between the wild and captive environments is that the natural breeding areas have high nitrate levels, due to run-off from agriculture — in captivity rainwater is used.

Another threatened amphibian is the Pool Frog (*Rana lessonae*). Previously thought to have been introduced in East Anglia it has now been granted the status of a genuine native amphibian on the basis of bones found during a study. It apparently, originally, has a much wider distribution and has existed at least since the end of the Ice Age. However, it seems to be extremely rare no breeding was recorded last year. Introduced specimens may well exist in other areas — the native species is a distinct brown. Possible sightings of Brown Frogs (in East Anglia) or any that are known to be in captivity should be reported to:

Tony Gent, English Nature, Northminster House, Peterborough, PE1 1UA, or to Jan Clemmons, Conservation Committee, British Herpetological Society, c/o Zoological Society of London, Regent's Park, London NW1 4RY. A calling male Pool Frog distends vocal sacs on each side of the head. It is hoped to establish a programme to save the species.

THE REPTILE MASTERS LTD.
Little Warley Hall Lane,
West Horndon, Near Brentwood
Essex CM13 3EN, England
Tel: 01277 811822
OPEN 7 DAYS A WEEK 10AM TO 5PM
Come and visit the largest reptile house in the south. All of our stock is beautifully displayed to the public. We supply snakes, toads, spiders, iguanas, lizards, live and frozen foods, plus all the accessories you require — too much to list.
Trade Welcome — Friendly Service and Free Advice — Mail Order/Access/Visa/Mastercard welcome

CLUBS

LIVE IN ESSEX and interested in reptiles/amphibians? E.R.A.S. meet in Witham on the second Thursday of each month. Contact 01621 819675 for further information.

AQUASPLASH
SNAKES, SPIDERS, LIZARDS & ACCESSORIES
MJS GARDEN CENTRE
BATH ROAD, HARE HATCH
READING, BERKS
Tel: (01734) 404188
OPEN 7 DAYS

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.

If the warmer weather coincides with the low spring tides a visit to a rocky shore can be rewarding during April. Small pools will contain the smaller prawns, rock pool fish, sea anemones and the first fry of the year. The more delicate red and green seaweeds will begin to decorate the pools on sheltered shores. These annual algae can provide an attractive border to pools on the sculptured limestone coasts of Dorset. On more exposed locations, hydroids, looking like miniature sea-firs grow on rocks, shells and seaweeds. Although they look like plants, they are colonial animals that consist of branches with microscopic polyps. The polyps behave like tiny sea anemones with stinging cells to capture the even smaller life in the plankton.

Inhospitable shores

In winter a rocky shore can be a rather desperate and drab place, and even in April it will only attract the very keen rockpooler. A lot depends on the location; on the most hospitable shores a sandstone platform will take the explorer down to the most interesting pools at the low spring tide mark. On other shores the visitor will have to scramble down the remains of a crumbling cliff to be greeted with a mass of broken chalk and seaweed strewn boulders.

The attractiveness of the shore at first sight does not give an immediate indication of its variety of fauna. Loose rocks are often very rich in small fish because they provide a place for the fish to hide under when the tide recedes. Crabs also need the protection of rocks or holes to creep into.

Colour

One of the reasons that 'Native Marine Aquaria' are not so popular as the tropical hobby is because the fish and invertebrates lack the bright colours of their reef cousins. There is no doubt this is true, but there are lots of colourful life on the British coasts and when collected together in an aquarium the final display can certainly rival a tropical marine aquarium for interest and attractiveness, with colours that are subtle and less garish.

On British shores the most colourful animals are the sea anemones that will attach themselves to the underside of rocks and often hide in the most inaccessible places. In a few limestone areas, colourful varieties of the Daisy Anemone, *Cereus pedunculatus*, form a carpet over the walls of deep pools. These anemones have long columns and when the tentacles are touched by the legs of a wandering prawn or the probing fingers of a rockpooler, they will quickly retract into a rock fissure.

Sea Anemones

Every marine aquarist will know that sea anemones are not plants but animals that use their tentacles to capture minute animals of the plankton and prey up to the size of small fish and crabs.

They belong to the phylum (major evolutionary group) of invertebrates called the Cnidaria. The name comes from the cells called cnidae which are present in all species in this group. The

▶ CONTINUED ON PAGE 88

The Beadlet Anemone, *Actinia equina*, is the most widespread British sea anemone to be found on all rocky coasts. Red, green and brown varieties occur.

PHOTO: ANDY HORTON

◀ CONTINUED FROM PAGE 86

cnidae contain the stinging cells of which the nematocysts are the commonest type. The nematocysts can only be seen under a powerful microscope and their mechanism for working is one of the fastest actions in the whole of the animal kingdom. The fluid-filled capsule called the nematocyst everts and forces the filament to discharge and eject venom into the prey. In sea anemones the tentacles contain the stinging cells and in some species they are powerful enough to kill small fish and prawns.

The trick to feed difficult anemones

It is important that the aquarist knows about this mechanism because not all anemones are easy to feed. Most rock pool species will happily take crushed or whole pieces of mussel or bottled invertebrate food, using their tentacles to manipulate their food towards the mouth which is the solitary opening leading to the gastric cavity called the coelenteron. However, a worldwide species with the apt name of Plumose Anemone*, *Metridium senile*, will sometimes refuse to feed on large items of organic matter in captivity.

The solution is knowing how to activate the nematocysts. In the wild, the Plumose Anemone inhabits 'high energy habitats' where the powerful tides and currents bring the sea rich in plankton to the sessile colonies. The anemone consumes mostly microscopic prey caught in the thin feathery concentric circles of tentacles. At the times of maximum current large items of dead prey become trapped against the colonies, and the anemone is able to manoeuvre this food to its mouth using 'catch tentacles' (enlarged tentacles). The trick is to mimic the conditions in the wild. This can be done in two ways: by introducing fresh real sea water with its plankton content, or by putting a plentiful supply of newly hatched brine shrimp in the aquarium. Ninety per cent of the time the Plumose Anemone can be tricked into consuming large fragments of boiled mussel or similar foods.

Zooxanthellae

Another problem in keeping sea anemones is maintaining anemones that contain zooxanthellae algae within their tissues. The chlorophyll in the algae stains the anemone a vivid green. If the algae dies the anemone gradually loses its green hue. This is seen most often in the Snakelocks Anemone, *Anemonia viridis*, which is very common on the southern and western coast of the British Isles.

Plumose Anemones, *Metridium senile*.
PHOTO: ANDY HORTON

Although this anemone will consume particle food the zooxanthellae appear to be essential for its long term survival. It is difficult to mimic the required summer light levels of about 4000 Lux indoors, but some success has been achieved in outdoor aquaria with frequent renewals of real sea water.

Notes:
* Known as the White-plumed, or Frilled, Anemone in the USA.

The Daisy Anemone, *Cereus pedunculatus*, is only found on southern and western coasts. This species contains zooxanthellae.
PHOTO: ANDY HORTON

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

Koi Shows in 1997

MAY

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

10-11 Norwich Section BKKS. 1st Open Show in the Exhibition Building of the Royal Norfolk Showground, Nr. Norwich. Further details contact Glyn Bowman on 01328 851695.

25-26 Merseyside Section BKKS. Open Show at Camphill Park, Hillfoot Road, Woolton, Liverpool. Contact Bob Pearson on 0151 733 8494.

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

JUNE

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

21-22 Kennet Valley Section BKKS. Open Show at Donnington Grove Country Club, Newbury, Berkshire. Contact Terry Speight 01488 862106.

29 Lower Thameside Section BKKS Open Show. Contact John Elliott, 0171 250 3558 (day), 01268 781990(eves).

AUGUST

3 Yorkshire Koi Society. Open Show. Harewood House, Leeds. Contact Graham Baines, 01423 864297, or John Thomson, 01723 864867.

9-10 British Koi Keeper's Society National Show Koi '97. Open Show at Billing Aquadrome, Northampton.

SEPTEMBER

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

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

DAVID TWIGG'S

KOI CALENDAR

Koi Meetings in April

2 Leicestershire Section BKKS. Photo competition. Kirby Muxloe Sports Club. Contact Ray Dunkley, 0116 277 1600.

6 Avon Section BKKS. Speaking on 'Stress' is Adrian Excell. 2.30pm. The New Friends Hall, Stapleton, Bristol. Contact Sandra Lane on 0117 9491061.

9 South Hants Section BKKS. Meet in Denmead Church Hall. 8pm. Contact George Rooney on 01420 473169.

9 Merseyside Section BKKS. Speaking on Bonsai is Derek Forshaw. Meet at Broadway Country Club, Norris Green. Contact Alan Findlay, 0151 284 5973.

13 Heart Of England Koi Society. AGM & Social evening. Meet near Dunchurch. Contact me on 01926 495213.

20 Worthing & District Section BKKS. Spring Auction at East Preston Scout Hall. 10am. Contact Mike Gunn on 01903 763493.

20 Northern Koi Club. Quiz & Slide show with Tony McCann & Paul Jackson. Contact Tony on 0161 794 1958.

27 Avon Section BKKS. AGM, 2.30pm. The New Friends Hall, Stapleton, Bristol. Contact Sandra Lane on 0117 9491061.

27 Chiltern Section BKKS. Annual Koi Auction. Lots taken from 9am, auction commences 12 noon at The Camelots Rugby Club, Chaulden Lane, Hemel Hempstead. Contact Mark Clarke on 01582 24194.

27 Leicestershire Section BKKS. Dealer trip to Aquajardin. Contact Ray Dunkley 0116 2771600.

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

BUY LINES

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

Nishikigoi — The Movie

New Vision, producers of the highly acclaimed Living Jewels series, proudly present Nishikigoi — The Movie: The Niigata Journey. Totally unique, it chronicles the Koi-hunting adventures of the incomparable Peter Waddington, author of Koi Kichi, on his Autumn harvesting and buying experience. On the VHS format the Niigata Journey is an enthralling insider's view of the very heart of Nishikigoi culture — exclusively filmed in the hallowed villages of Niigata Prefecture — an absolutely compelling view of the Koi masters at work. Gods of

Newly harvested Sakai Ai Goromo.

Nishikigoi, famous worldwide for producing the very best Koi on earth.

Not only does Niigata Journey get to the heart of the very essence of Koi, but also uniquely captures many other facets of Japanese Koi culture, their communities and their lifestyle. The film covers many aspects of the Japanese Koi industry, including: the history of Nishikigoi, the Japanese approach to Koi, the incredible Ojiya Nishikigoi Centre; selecting Koi from breeders, a genuine Japanese Koi auction, Tategoi recognition and appreciation. PLUS — a close-up look at Dainichi, Tanaka, Igarashi, Hasegawa, Shintaro and many more of the world-famous Koi breeders with whom Peter has such special relationships, enabling film to be shot of the actual harvesting of mudponds, footage so fantastic all who see it will be amazed.

Niigata Journey includes some breathtaking landscapes — sweeping, mist-shrouded mountains, gushing streams of every colour and three-dimensional sunsets where darkness appears light — all conspiring to bewilder the senses — and contribute to the mystique of this very special region. For the first time ever ALL these elements are beautifully captured as only award winning professional video photographer Nick Read can.

A truly breathtaking piece of work Niigata Journey is a film for all. If you've never before seen a Koi you will appreciate the stunning photography and informative content — but if you are a Koi enthusiast you will be enthralled at its fact-filled narrative, attention to detail and simply fascinating Koi material.

Niigata Journey is priced at £22.95 plus P&P and is launched on 1 May 1997.

THE DIRECTOR'S CUT — order one of the first 5,000 copies and receive a second feature entitled Back In the UK *totally free. The extra programme begins at London's Heathrow airport with the arrival of high-grade Japanese Koi. Their unloading reveals a fascinating process, an interesting and entertaining look at what goes on behind the scenes and some top UK dealerships.*
Reserve your Director's Cut Limited Edition NOW — call the New Vision phone or fax hotlines with your Credit/Debit Card details or send a cheque/PO (£ Sterling only) £22.95 plus £1.50 P&P UK ONLY (overseas orders add £3 for postage & packing) to: New Vision Video Productions, Unit 15 Wivenhoe Business Centre, Brook Street, Wivenhoe, Essex CO7 9DP. Tel: 01206 827338. Fax: 01206 824845.

New cartons to meet demand

Paradoxically, Pettex Limited is introducing its Pettex Premium Pond Sticks and Pettex Premium Pond Pellets in smaller packages to meet growing customer demand!

Stuart White, Marketing Manager at Pettex Ltd. explained: "We initially launched the Pond Pellets in 10kg bags and the Pond Sticks in 5kg bags but we have found there is big demand for these products in smaller sizes. Pond Pellets are now available in 2.5kg cartons, priced £7.66 RRP, and the Pond Sticks can be bought in 1kg cartons, retailing at £5.99."

The new environmentally-friendly cartons, with convenient carry handles (and in the same bright colour schemes of the larger bags), are made from recycled materials and can be refilled as they have resealable lids.

Suited to all types of pond fish from Goldfish to Koi, Pettex Premium Pond Foods provide the optimum formula for better fish health, colour and growth, whatever the fishes' age.

After extensive national acceptance trials yielded excellent results Pettex will be launching a new specialist high-performance range for Koi — called Pettex Koi Plus; available in 2kg cartons the product will be on view at Petindex at Birmingham NEC on 20-21 April.

Details from: Pettex Limited, 62-70 Fowler Road, Hainault Industrial Estate, Hainault, Ilford, Essex IG6 3UT. Tel: 0181 501 1033. Fax: 0181 501 3943.

Range of Pettex Fish Foods now produced in smaller packages to meet growing demand.

BUY LINES

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

New Fish Foods

A new range of flake fish foods has been launched by Waterlife. SUPER-VIT foods include Basic, Vegetable, Vitality & Colour, Cichlid Formulations for Tropical Fishes and Goldfish Colour.

Each food has organoleptic properties and also enriched with Inositol, exogenous aminoacids, stabilised Vitamin C as well as substances enhancing colouration, vitality and reproductive fitness.

Ingredients used are purchased from high-quality sources worldwide and fulfil the fishes' natural dietary needs.

The uses for the different formulations are practically self-explanatory, but the cichlid food is also suitable for marine fishes whilst the Goldfish food can be fed to young Koi and other carp-like fishes.

Each formulation is available in tub sizes of 20g, 50g, 110g, 210g and 1,000g.

For further information, please contact: Waterlife, Bath Road, Longford, nr West Drayton, Middlesex UB7 0ED. Tel: 01753 685696/682487. Fax: 01753 685437.

New Filters

The majority of purifiers from Purity on Tap use super-efficient 'short travel' powdered carbons but new additions to the range now offer the aquatic hobbyist the further choice of using models that use granular carbons. The reason is that the company feels that they can offer those that prefer granular carbons the opportunity to choose from a range of activated carbon purifiers which, by design, should easily outperform others of like size; additionally, owners of other marques can be supplied with cartridges to fit their housing to enhance their performance.

Whilst a granular carbon purifier will never match the particulate retention capacity, or efficiency, of those using short-travel carbons, by building several stages of filtration into each unit the new range exhibits considerable improvements over other granular carbon equipped purifiers.

The GP Junior range comes in exclusive brown housings (the GMP Junior range has the 'Heavy Metals' de-ionising media picked out in a white housing, to prevent being confused with standard granular systems), and has wall brackets and hosetails for DIY fitting.

The four-stage, twin-pod GP2 priced at £105 will purify up to 4000 gallons at ½ gpm; replacement cartridges cost £32 for the set of two.

The six-stage, triple-pod GP3 is a competitive £165 for up to 7,000 gallons at ½ gpm; replacement cartridges cost £49.50 for the three required.

The eight-stage, four-pod GP4 comes at £220 for up to 25,000 gallons at 1gpm; the set of four replacement cartridges cost £65.

For 'Heavy Metals' removal, the five-stage, triple-pod, GMP3 at £169.50 has a highly-effective de-ionising media added to it for up to 2500 gallons of purified water at ½ gpm. The three replacement cartridges cost £53.

Larger still, the GMP4, seven-stage, four-pod system (£235 with the same de-ionising resin) will give up to 20,000 gallons at 1gpm; while a set of replacement cartridges costs £75.

All 'lifetime' ratings will vary with local conditions and fishkeepers are advised to obtain a free Drinking Water Quality Report from their local Water Utility. These systems should be available from the extensive network of Purity on Tap dealers, or details are available from Charles Harriss at:

Purity on Tap, Wickfield Farmhouse, Shefford Woodlands, Hungerford, Berkshire RG17 7AL. Tel: 01488 648319. Fax: 01488 648997.

New Nitritech Filter Systems

Advanced materials and new moulding technology has enabled Nitritech to produce a new range of units manufactured in High Density Polyethelyne (HDPE). In addition to the new Trickle Tower launched in 1996 the 911 series modular filter deploying REM (Reticulated Ether Media) now joins the Nitritech range. The high-performance 911 series, a modular system built in HDPE, is capable of performing on systems up to 6,000 gallons. Advanced design means that the system is very compact — so you won't have to dig up half your garden to get it in.

Nitritech Trickle Systems are now available in both GRP and HDPE. The Trickle Filter is made in GRP and the Trickle Tower in HDPE. The Trickle Tower also comes with a really neat option: an additional extension stage is available as an optional extra — just the right thing for summer when temperatures are highest — in a few minutes it is possible to increase the capability by 66 per cent by adding a TT extension module.

All Nitritech systems are designed to operate with minimum solid levels in the biological phases. To ensure this Nitritech advise deploying Nitritech Vortex Settlement Chambers (also now available in HDPE) before either the 911 Wet filter system or The Trickle Tower.

The combination of these components offers Koi keepers a wide range of high performance filtration options in both fibreglass (GRP) and high density polyethylene (HDPE) for their specific requirements. Although the design and operation of the systems are different they have two very important factors in common: (1) They work! and (2) They are very competitively priced!

Systems are available direct from Nitritech and from all good Koi shops.

More information from: Nitritech, Sunbeam Nurseries, 119 Bristol Road, Frampton Cotterell, Bristol. Tel: 01454 776927. Fax: 01454 250753.

Pond liners on a roll

Leading water gardening specialist Hozelock has introduced Aqua30, a range of pond liners available 'off the roll' with sizes ranging up to eight metres wide.

"The use of flexible pond liners is becoming increasingly popular as people become more ambitious with their pond design," remarked Richard Bradley, Marketing Manager of Hozelock's Aquatics Division.

"By adding Aqua30 pond-liner rolls to our range of pre-packed pond liners pondkeepers now have the option to build a pond for virtually any size of garden."

The new pond liner (called Aqua30 because of its 30-year guarantee) is manufactured in 0.5mm polyethylene in four widths: 2, 4, 6 and 8m. The 2m width is on a 100m roll; while the remaining widths on 25m rolls.

"Low-density polyethylene allows greater width of material to be used without the need for seams, which could cause weak points in alternative forms of liner, such as PVC," added Richard Bradley.

"The flexibility of the material enables installation to be made more easily, it is also highly-resistant to ultra-violet light and extremes of temperature, and is harmless to fish and plants."

Each roll has a colour-coded point-of-sale label, to identify the right size of liner and retail price; a specially-designed merchandiser incorporating built-in slide-away cutting table is also available for retailers.

Details from: Hozelock Ltd, Haddenham, Aylesbury, Buckinghamshire HP17 8JD. Tel: 01844 291881. Fax: 01844 290344.

.. News Desk ... News Desk ..

Winner Willis in whale-watching bliss

Tetra's ongoing 'Feed a Fish and Save a Whale' campaign has its first winner! Mrs Jane Willis of Fleet in Hampshire had a go at the competition after spotting the entry form from one of Tetra's special promotional tubs beside a friend's fish tank. The competition featured a cartoon and the thousands of entrants had to come up with a suitable caption.

Mrs Willis was delighted to be notified on Christmas Eve that her caption: 'Tetra makes every meal a special ORCA-sion', was the winning entry, and she now plans to take the holiday with her husband and is also paying for one of her two daughters to go along.

She said: "It was the best Christmas present I could have had, its fantastic! I didn't believe that anyone really wins these competitions but obviously they do!"

The family now has to choose between Mexico and Antarctica as the whales only appear in these regions at the time of year that they will be travelling.

You can still win the remaining whale-watching holiday from Tetra's scratch card promotion in special tubs of Tetra fish food. The top prize is a second holiday for two worth £3,000 with many runners-up prizes. Money raised from sales of the promotional tubs helps WDCS fund vital projects to protect and conserve these beautiful creatures all around the world.

Tetra also announced a further donation of £2,500 to WDCS bringing the overall total to £12,500 in just eight months. The original target was set at £10,000 and with four months left for the 'Feed a Fish and Save a Whale' campaign to run Tetra is on its way to doubling that figure!

All Enquiries to Joan Meagher, Aylesworth Fleming Public Relations, Aardvark House, Poole Hill, Bournemouth. Tel: 01202 295723. Fax 01202 290643.

Free stockist locator

A double free telephone service has been set up by Nishikoi for the benefit of readers seeking nearest stockists of Nishikoi products and also nearest expert advice on all aspects of fishkeeping. The number to ring is 0800 435864. Information supplied by Nishikoi Aquaculture Ltd, White Hall, Wethersfield, Essex CM7 4BP. Tel: 01371 851424. Fax: 01371 851429.

Cyprio joins Hozelock

Hozelock Group PLC has acquired Cyprio Ltd, the UK market leader in pond filtration systems for a total purchase consideration of £5.8 million.

Hozelock, already established in water gardening through its Aquatics Division, has its primary strength in submersible pond pumps and the Cyprio acquisition not only adds the leading range of filters, UVCs and filter pumps but also exceptional knowledge of water treatment technology.

David Codling, Chief Executive of Hozelock Group, said: "We have seen rapid growth in our aquatics business in recent years and the addition of the Cyprio range will further enhance our overall offering."

The founder of Cyprio, Malcolm Goodson, who continues as Managing Director, is delighted his Company is joining the Hozelock Group, saying "Access to the design, manufacturing and marketing skills of Hozelock will enable Cyprio to further exploit its expertise in pond filtration."

The Cyprio business will continue to operate independently from its site at Frognall, near Peterborough.

Contacts: David Codling, Chief Executive, Hozelock Group plc (tel: 01844 291881); Malcolm Goodson, Managing Director, Cyprio Ltd (tel: 01778 344502).

Selective Koi Wholesale announce major expansion

Selective Koi Sales' wholesale operation, SKW (part of Selective Koi Sales in Norwich, one of Europe's top Koi retailers), has announced the opportunity for SKW trade customers to visit Japan and select their own Koi from the vast selection offered by SKW established supply routes.

SKW and Yoshida Fish Farm in Isawa, one of the biggest Koi farms in Japan, are able to offer not only Yoshida Koi but also Koi purchased from the cream of Koi producers all over Japan, in their Nishikgoi Wholesale Super Store all at very competitive prices. The volume of Koi bought by Yoshida Fish Farm means their buying power is second to none, reflected in their prices to SKW Trade customers. It's a one-stop Koi buying trip — no need to tour the main buying regions — SKW have assembled Koi in Isawa for you to select from.

If you are a Koi professional seeking a totally reliable, high-quality supplier with unrivalled selection of Koi at some of the most competitive prices anywhere, call Bill Morton at: SKW, Selective Koi Wholesale, 60 Cedar Drive, Southwater, Nr Horsham, West Sussex RH13 7UF. Tel: 01403 732796.

Trade Mark Registration

AllClear Water Purifier's team were thrilled to add the 'TM' mark to their logo. How did they do that?

Ann Telford says they felt as if they had survived a barrel trip over the Niagara Falls to achieve registration!

The saga started three years ago. The first hurdle was to show their name 'AllClear' was a fair description of their products. Why? The name 'AllClear' could be seen as describing their tap water purifiers. Sound independent test results, analysis of water reports and AllClear's in-depth technical service all helped show the suitability of their name. To cut a long story short, the last hurdle was displaying their logo in the Trade Marks Registration Journal. After a few nail-biting months, AllClear received the final letter of approval in December 1996, just in time to be a great Christmas present!

Details from: AllClear, 59 Harewood Road, Brentwood, Essex CM14 5AG. Tel: 01277 214911. Fax: 01277 201740.

Little Giant Pumps now available in the UK

Little Giant, a household name in the USA, consistently deliver high quality, high performance pumps designed and built specifically to deal with any pond environment — even pumps that will pump solids up to 51mm in diameter and with a pumping range of 70 to 7,000 gallons an hour. Whether it's an ornamental fountain, pond circulator or a Koi pond requirement — Little Giant have a unit to meet the need.

Internationally-respected pumps company, W. J. Furse & Co Ltd, of Nottingham, have launched the impressive range of Little Giant Pumps in the UK.

Senior UK Sales Manager Craig Peebles commented: "We are absolutely delighted to announce our alliance with Little Giant Pumps as we believe that pond and Koi Keepers will find the range of benefits offered by the Little Giant range very appealing. Forward orders have already justified our confidence in this great range of pumps and, as most Koi keepers put reliability at the top of their priority list, and Little Giant have an unrivalled reputation for durability and total reliability, we believe this range of benefits combined with very competitive prices will deliver major success for the Little Giant range in the UK."

Little Giant Pumps are already on the shelves of many aquatic stores and W. J. Furse are keen to add to the list of dealers stocking Little Giant Pumps and want to hear from aquatic professionals wishing to add another winning product to their range.

Full details of the Little Giant range from: Craig Peebles, W. J. Furse, Wilford Lane, Nottingham NG2 1EB. Tel: 0115 9863471. Fax: 0115 9860538.

SUBSCRIBE TO A&P!

AQUARIST & PONDKEEPER is the foremost fishkeeping magazine for the specialist and beginner alike. A Postal Subscription has many distinct advantages: ● *POST FREE (UK);* ● *EARLY DELIVERY;* ● *GUARANTEED COPY*

Fill out the form below and return to: SUBSCRIPTIONS DEPT., MJ PUBLICATIONS LTD., CAXTON HOUSE, WELLESLEY ROAD, ASHFORD, KENT TN24 8ET

Rates: UK £26, Europe £35. Airmail — Zone 1 £55, Zone 2 £61

My remittance of ..... is included
(overseas subscription ..... sterling)
Or Credit Card ☐ ACCESS ☐ VISA
No. ..... Expiry Date .....
Signature .....
Name .....
Address .....
.....
..... Postcode .....

OPEN SHOWS

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

5/6 April Yorkshire Aquarist Festival, Doncaster (Y)
7 April Eastleigh A.S. (FB)
13 April Merthyr A.S. (FB)
20 April Strood A.S. (FB)
27 April Robin Hood Aquarists (FN)
27 April Caer Urfa A.S. (FB)
3 May Southend, Leigh & D.A.S. (FB)
4 May Aberdare A.S. (FB)
4 May Musselburgh A.S. (FS)
11 May Corby A.S. (FB)
11 May Four Lane Ends A.S. (FB)
11 May C.A.S.T. 88 (FN)
16/18 May Grocklemania
18 May Isle of Wight A.S. (FB)
1 June Derby & D.A.S.
7 June South Park A.S.S. (I)
8 June Redcar A.S. (N)
14 June Bristol Tropical A.S. (new date) (FB)
15 June Halton A.S. (FN)
22 June Workington A.S. (FS)
29 June Seascale Junior Fishkeepers (FB)
5 July Port Talbot A.S. (FB)
20 July Bournemouth A.S. (FB)
27 July Kent Association of Aquarist Societies (FB)
10 August Whitby A.S. (N)
24 August Cramlington A.S. (FB)
24 August Tyne Tees Area Association (FB)
30/31 August Fishworld '97, Dunstable (FB). Koi Show, National Junior Fishkeeper's Open Show (FB), British National Open Show (incorporating British Open Fish Championship)
13 September Hounslow A.S. (FB)
12 October Solway A.S. (FS)
25/26 October British Aquarists Festival, George Carnell Leisure Centre, Manchester (FN)
31 October/2 November Supreme Festival of Fishkeeping, Weston. 2 November Supreme Championship and Open Show (FB)
1 November National Junior Fishkeeping Open Show (FB)
2 November Supreme Championship & Open Show (FB)

SOCIETY WORLD

Get caught up in this net!

The next time you go 'surfing the Net' (if you're equipped or otherwise so disposed) take a look at a great new British website — the British Aquatic Resource Centre. Organised by Kathy Jinkinson (she'll be writing for *A&P* shortly), it offers information on many aspects of the hobby which are both meaningful and local — something not always appropriate with overseas sites. There are plans to expand the site into a much more 'interactive' mode — turning it more into an electronic club — in the near future where you can check in for discussions and information exchange.

You can find the BARC at kathy@c5kc.demon.co.uk

Robin Hood Aquarist's Show and Auction

Ray Pearce, RHA Show Secretary, advises that the Society's Open Show and Auction will be held on Sunday, 27 April 1997 at the Highbank Community Centre, Farnborough Road, Clifton, Nottingham. The Show will be run to FNAS Show Rules. Booking in of Auction Lots and Exhibit Benching will be between 10.30am and 12.30pm with judging commencing at approximately 1.00pm. The Auction will commence at approximately 1.30pm.

For further details contact Ray Pearce at 515 Farnborough Road, Clifton Nottingham NG11 9DH. Tel: 0115 974 4736 — answerphone available).

York fully booked for 1997

Alan Holmes, Secretary of York & District Aquarist's Society, reports a fully-booked year of Speakers, Video Shows and Slide Shows to entertain and inform members and anyone else who cares to drop into their Society meetings. These are held on the second Tuesday of each month at the Punch Bowl Inn (upstairs Function Room), Lowther Street, York. You can get instant information about the next meeting from Alan on 01904 414272.

Only £6 inc. p&p*

A PERFECT COMPANION TO YOUR AQUARIST & PONDKEEPER MAGAZINE

The NEW AQUARIST & PONDKEEPER BINDER is now available

The quality Easibinder is designed to hold 12 copies of A&P using binding wires. The Easibinder is manufactured from micron board with the magazine name gold blocked on the spine. To obtain your Easibinder just fill in the details below and enclose a cheque/PO for £6 (inc. p&p). (*Overseas rates on request). Alternatively, use our credit card facility.

No. of Easibinders .....
Total .....
CREDIT CARD ☐ ACCESS ☐ VISA
No. .....
Expiry Date .....
Signature .....
Name .....
Address .....
.....
.....
Post Code .....

Send orders to: BINDERS
MJ PUBLICATIONS LTD.
CAXTON HOUSE
WELLESLEY ROAD, ASHFORD
KENT TN24 8HT

DIARY DATES

APRIL

1 Gloucestershire A.S. Inter-Club Quiz. Bell & Gavel PH, Castle Market, St. Oswalds Road, Gloucester. 7.30pm. More information from Andy, 01452 372548 or Christine, 01242 520428.

4-6 Anabantoid Association of GB. Storby Hall, Endcliffe Vale Road, Sheffield. 13th Members' Weekend. Open to members only. Non-members may join on the day. Further details with sae from: Chris Clark, 19 Chiltern Crescent, Sprotbrough, Doncaster, South Yorkshire DN5 7PE.

7 Reigate & Redhill A.S. Bring & Buy Sale, Sirawson Hall, Albert Road, Horley, Surrey. Doors open 7.30pm. Auction starts 8pm. Refreshments served. Any non-club member very welcome to join us for the evening. Details from Jeremy Spencer, 01293 512932.

11 South Coast Cichlid Group. 'Fishy Problems' solved and a general discussion about Cichlids at the Stadium Public House, Old Shoreham Road, Hove. 7.45pm. Details from Sonia, 01273 887741.

13 Halton Aquarist Society. Auction at Higher House, Northwich Road, Brookvale, Runcorn. Auction starts at 1pm. For pre-booking and further information phone Ted Derrick, 0151 423 3896.

13 Aberdare A.S. Open Show and Auction, Cyfartha Castle, Merthyr Tydfil.

20 Strood and D. A.S. Open Show, The Memorial Hall, Cliffe Woods, Kent. Benching 9am to 12 noon.

20 Preston & D. A.S. Spring Auction. Fish, Plants, Equipment. Student's Union Hall, Fylde Road, Preston (University of Central Lancashire, Preston). Admission: Adults 50p, Children Free. Information from Steve Spencer, 01772 321145.

27 Caer Urfa A.S. Open Show & Auction, Perth Green Community Centre, Inverness Road, Jarrow. FBAS Trophy, Classes Ma and Ni-Rei. Raffle, Refreshments and Free Exhibitors' Prize Draw. Benching from 11am. Details from: Jim Musgrove, 0191 454 0676.